
Progress Report *2005*

***Responses to Air Accidents Investigation Branch (AAIB)
Safety Recommendations***

*Responses received to AAIB recommendations made up to 31 December 2004,
presented to the Secretary of State for Transport*

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Foreword

The Air Accidents Investigation Branch is part of the Department for Transport and is 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 authority is enshrined in The Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 1996 and 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 Regulation Group's (SRG) role is to ensure that UK civil aviation standards are set and achieved in a co-operative and cost effective manner. Until recently the SRG had to satisfy itself that aircraft were properly designed, manufactured, operated and maintained; that airlines were competent; that flight crews, air traffic controllers and aircraft maintenance engineers were fit and competent; that licensed aerodromes were safe to use and that air traffic services and general aviation activities met required safety standards. They continue to fulfil most of these functions but, in September 2003, the responsibility for certification and continued airworthiness of aircraft was transferred to the European Aviation Safety Agency (EASA). Therefore AAIB recommendations relating to airworthiness, traditionally targeted at the CAA, are now directed to the EASA.

Accident investigation and safety regulation are clearly different and the two functions are deliberately kept independent of 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 EASA is essential, while in no way jeopardising the independence of the accident investigation.

Effective day to day liaison has been maintained between the AAIB and the CAA, 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, EASA or other bodies, matters which it believes require action is by means of Safety Recommendations.

Recommendations can be made at any stage as the AAIB investigation progresses. The CAA has formal procedures for the receipt and evaluation of such recommendations and initiation of necessary action. In its evaluation the CAA considers all the implications of the recommendation and action being proposed taking into account the views of other Regulatory Authorities, e.g. EASA or the European Joint Airworthiness Authorities (JAA). The CAA responds to the AAIB as quickly as possible on all recommendations as they arise, those of an urgent nature being acted upon immediately. The EASA response to AAIB safety recommendations has, until recently, been less formalised but the AAIB now receives an acknowledgement that a recommendation has been received but as yet the AAIB has only received limited information from EASA as to whether a recommendation has been accepted or if any safety actions have been implemented.

Historically, responses to the Air Accidents Investigation Branch's recommendations have been published by the CAA in their annual Progress Report on AAIB recommendations under the cover of a Civil Aviation Publication (CAP). With the recent shift of airworthiness responsibilities however, it has become more logical for the AAIB to take responsibility for reporting on the responses to its recommendations regardless of the target authority or organisation.

The Report

This is the first annual Progress Report on Safety Recommendations submitted to the Secretary of State for Transport by the AAIB. It contains all the recommendations made by the AAIB in 2004 including the responses to those recommendations received up to and including 30 June 2005 and those recommendations categorised as open from previous years.

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 2,250kg MTWA and below
4. Microlights
5. Rotorcraft 5,700kg MTWA and above
6. Rotorcraft above 2,250kg and below 5,700kg MTWA
7. Rotorcraft 2,250kg 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)
2. Accepted - OPEN (appropriate action planned but not yet implemented)
3. Rejected - OPEN
4. Partially accepted - OPEN
5. Partially accepted - CLOSED
6. Response awaited - OPEN

Statistics

Recommendations made in 2004 and status:

Number	Status Category					
	1 Accepted CLOSED	2 Accepted OPEN	3 Rejected OPEN	4 Partially accepted OPEN	5 Partially accepted CLOSED	6 Response awaited OPEN
101	44	17	5	6	1	28
% of total	43.56	16.83	4.95	5.94	0.99	27.72

Note: 6 safety recommendations were allocated with a recommendation number but were withdrawn before issue

Recommendations made in 2004 by Addressee:

Addressee	Number
Airbus	8
Apex Aviation	1
BAA plc	1
BGA	4
BMAA	6
Boeing Aircraft Company	4
British Airways	1
CAA	32
DfT	2
DGAC France	2
Director General of Civil Aviation (Netherlands)	1
EASA	8
EMBRAER	1
FAA	12
Goodrich Aircraft Wheels and Brakes Division	5
GROB-WERKE	1
IAE	1
Instituto de Aviacao Civil Portugal	1
Irish Aviation Authority	1
JAA	3
Medway Microlights	2
MOD	1
PFA	7
Raytheon Aircraft Company	5
Sikorsky	3
Skyservice Airlines	2
UK Offshore Operators Association	1

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

Section 1

Aeroplanes above 5,700kg MTWA

Fokker F27-500	Bournemouth Airport	07-May-2004	Incident
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AAIB Bulletin: 10/2004
FACTOR: F45/2004

Synopsis

The crew reported for duty at 0300 hrs expecting to operate a two-sector return freight flight to Jersey. As they approached the aircraft they noticed that the aircraft's pneumatic system was being charged; this was not the normal procedure. The engineers present explained to the commander, whilst outside the aircraft, that this was a fleet wide procedure following pneumatic problems on another aircraft. Meanwhile, the first officer entered the flight deck and asked the engineer there if there was a pneumatic leak. Although he was told there was not, he noted that the brake bottle pressure, though within limits, was slightly lower than normal. Suspecting the integrity of the pneumatic system, he decided to pull out the pneumatic isolating valve pin, contrary to the checklist requirement that was to push it in.

When the commander entered the cockpit, the first officer drew his attention to the brake pressure but did not inform him that the isolation pin had been pulled out. The engines were then started but although the after start checklist required a check of pneumatics, the isolation pin remained out. During the taxi, the crew noticed that the pneumatic pressures were abnormally low but still in the green acceptable band. Shortly afterwards, the aircraft veered to the left and, although full right steering wheel was used and right brake was applied, directional control was lost. At this stage, realising that the pneumatic isolating valve pin was out, the commander pushed it back in but was unable to prevent the aircraft leaving the taxiway and travelling 50 metres along the grass before coming to a stop. There was no attempt to activate the emergency braking system. The commander commented that his left hand was fully engaged holding the steering wheel in an attempt to recover the loss of directional control and it would have been necessary to remove this hand to operate the emergency brakes.

The engines were shut down and engineering assistance obtained. An emergency was not declared but ATC subsequently alerted the emergency services who attended the aircraft. An unsuccessful attempt was made to tow the aircraft forwards with the engines running. This however, is not recommended due to possibility of nose landing gear damage. The aircraft was eventually recovered from the grass tail first.

SAFETY RECOMMENDATION 2004-078

It is recommended that the UK Civil Aviation Authority consider bringing the circumstances of this incident to the attention of all UK operators of F27 aircraft.

Response

The CAA has fully discussed the circumstances of this incident with the only UK operator of F27 aircraft. The operator has now modified the F27 checklists and pilot training, such that the functionality and purpose of the pneumatic isolating pin should now be fully understood.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-079

It is recommended that the Director General of Civil Aviation of the Netherlands and the type certificate holders, Stork B.V., consider bringing the circumstances of this incident to the attention of all other operators of F27 aircraft.

Response

Fokker Services has included a reminder to follow the (A)FM checklist items in the Airworthiness Recommendations Catalogue (ARC).

Status - Accepted - closed

Raytheon 390 Premier	Blackbushe Airport	07-Apr-2004	Accident
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AAIB Bulletin: 1/2005

FACTOR: F4/2005

Synopsis

After takeoff the pilot was unable to raise the landing gear and was presented with failure indications affecting both the lift dump and anti-skid systems. Following a successful landing at Farnborough, and discussions with the aircraft's maintenance organisation, the aircraft was flown to Blackbushe for further technical investigation. After landing on Runway 26 the aircraft left the runway, struck a series of obstructions and was destroyed: there was no fire and the pilot was uninjured.

The support bracket for the right main landing gear weight-on-wheels switch was found to have sustained a pre-impact failure which accounted for the indications reported by the pilot.

SAFETY RECOMMENDATION 2004-095

It is recommended that Raytheon Aircraft Company review the design and installation of the weight-on-wheels switches and support hardware fitted to the Premier 1 aircraft, with a view to reducing the possibility of stress corrosion cracking.

Response

Raytheon Aircraft Company has accepted this recommendation. In addition to the Mandatory Service Bulletin 32-3678 Raytheon Aircraft Company has revised the appropriate engineering drawings and production planning data to specify the correct assembly of the switches and attaching hardware. Finally, for new production aircraft (beginning at serial number RB-143), and spares, the switch attach bracket material has been changed to 4130 steel to improve corrosion protection.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-096

It is recommended that Raytheon Aircraft Company review the logic of displaying a LIFT DUMP FAIL and inhibiting the system due to a weight-on-wheels switch disagree on the Premier 1 aircraft, and modify the system so that lift dump remains available.

Response

Raytheon Aircraft Company has accepted this recommendation and has reviewed the lift dump system to evaluate weight-on-wheels (WOW) logic related to lift dump operation. The Spoiler Control Unit (SCU) controls all functions of the spoiler system: roll control, speed brakes, and lift dump. The SCU must successfully complete a Built-In-Test (BIT) prior to each flight in order to enable the various functions. The BIT sequence results in movement of the spoiler/lift dump panels, and thus must not occur whilst airborne. The WOW logic is required to inhibit BIT in flight. While it may be possible to modify the system design to eliminate annunciation of LIFT DUMP FAIL in the event of squat switch disagreement, such a modification would require changes to SCU hardware, software, and aircraft wiring. As noted below, Raytheon Aircraft Company is adding information to the Model 390 FAA Approved Airplane Flight Manual to clarify and expand landing performance information, including detailed procedures for use in the event of LIFT DUMP FAIL annunciation. Thus, Raytheon Aircraft Company considers that changes to SCU WOW logic may be appropriate as a product improvement at a later date.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-097

It is recommended that Raytheon Aircraft Company review the logic of displaying ANTI SKID FAIL for a weight-on-wheels switch disagree on the Premier 1 aircraft, when the system is otherwise operational.

Response

Raytheon Aircraft Company has accepted this recommendation and has reviewed the anti-skid system to evaluate WOW logic related to anti-skid operation. While it is possible to modify the system design to eliminate annunciation of ANTI SKID FAIL in the event of squat switch disagreement, such a modification would require changes to anti-skid system hardware and software. Raytheon Aircraft Company is adding information to the Model 390 FAA Approved Airplane Flight Manual to clarify and expand upon the anti-skid system, including detailed procedures for use in the event of ANTI SKID FAIL annunciation. Thus, Raytheon Aircraft Company considers that changes to the system related to WOW logic may be appropriate as a product improvement at a later date.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-098

It is recommended that Raytheon Aircraft Company should carry out the following amendments to the Airplane Flight Manual for the Premier 1 aircraft:

1. Revise the Lift Dump Failure (Lift Dump Annunciator Illuminated) abnormal checklist to include recommendations on required braking technique and to include the warning of braking efficiency published as part of the Lift Dump Fails to Extend (Lift Dump Warning Tone Sounds) emergency checklist.
2. Review all Airplane Flight Manual and abbreviated checklists to ensure that flight critical items included in Warnings and Cautions in the Airplane Flight Manual are included in the appropriate abbreviated checklists.
3. Expand the Performance section of the Airplane Flight Manual to include advice and, where appropriate, data for multiple system failures.
4. Amend, where appropriate, performance charts to include all associated conditions on which the published performance is based.

Response

Raytheon Aircraft Company has accepted this recommendation and is finalising an extensive revision to the Model 390 Pilot's Operating Manual, FAA Approved Airplane Flight Manual, and FAA Approved Abbreviated Pilot Checklist. The revisions include the following:

Expanded information about lift dump and anti-skid systems. The information includes details of operation and procedures to be followed in event of LIFT DUMP FAIL and ANTI SKID FAIL annunciation, both alone and in combination. Procedures for identification of, and response to, WOW switch failure have been added. Detailed information about braking technique and performance is included for these conditions.

Consistent information between the Airplane Flight Manual and abbreviated checklist regarding failure annunciations and related procedures.

Guidance for application of performance factors in response to failure annunciations.

Clarification and consistent presentation of the conditions under which performance data was derived. Detailed information about the effects of variations in those conditions has been included.

Addition of wet and contaminated runway landing performance data. The data will be presented as supplementary, non-approved data.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-099

It is recommended that Raytheon Aircraft Company review the presentation of performance data in the Airplane Flight Manual for the Premier 1 aircraft to render it less susceptible to errors in interpretation.

Response

Raytheon Aircraft Company has accepted this recommendation. The Airplane Flight Manual and abbreviated checklist performance data is to be presented in tabular format, and will include corrections for runway gradient and wind component. The Pilot's Operating manual, Airplane Flight Manual and abbreviated checklist revisions are presently in process and it is expected that the revisions will be published at the end of 2004.

Status - Accepted - closed

Airbus A321-211 Boeing 747-436	London Heathrow Airport	23-Mar-2004	Accident
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**AAIB Bulletin: 11/2004
FACTOR: F54/2004**

Synopsis

Whilst EI-CPE was stationary on Taxiway U, behind an A330 at the ETTIV holding point, its rudder was struck by the wing tip of G-BNLK, which was under tow along Taxiway A. The investigation revealed that the towing crew of G-BNLK had assumed that as they had been cleared to tow, they would be clear of all obstacles.

SAFETY RECOMMENDATION 2004-072

The Civil Aviation Authority should consider amending Rule 37(2) of the Air Navigation Order (CAP 363) to specifically make it the duty of those persons responsible for the towing of aircraft on manoeuvre areas of aerodromes to take all possible means to ensure that the aircraft under tow does not collide with another aircraft, or other obstacle, regardless of any Air Traffic Control or Ground Movement Control clearance.

Response

The CAA accepts the Recommendation and will consider amending the Rule 37(2) of the Air Navigation Order (CAP 363) to specifically make it the duty of those persons responsible for the towing of the aircraft on manoeuvre areas of aerodromes to take all possible means to ensure that the aircraft under tow does not collide with another aircraft, or other obstacle, regardless of any Air Traffic Control or Ground Movement Control clearance.

CAA Action

The CAA has set up a small working group, with involvement from industry, to explore all the issues associated. The feasibility of implementing any legislation or regulatory changes considered necessary will be examined. The target date for the end of this study is the end of 2005.

Status - Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2004-073

The Civil Aviation Authority should enhance CAP 642 'Airside Safety Management' to include guidance on the responsibilities of towing crews of aircraft under tow, especially with regard to obstacle and wingtip clearance in aircraft manoeuvring areas so that such clearance is not inferred from ATC clearances to tow an aircraft.

Response

The CAA accepts the Recommendation. Action will be taken to amend CAP 642 through the AOA/CAA CAP 642 Working Group, and the CAA will issue appropriate information to aerodrome operators.

CAA Action

The AOA/CAA CAP 642 Working Group has made an amendment to CAP 642, which will be published by July 2005.

Status - Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2004-074

British Airports Authority plc should ensure that training of individuals for the issue of 'C' manoeuvring area licences, includes the responsibilities of drivers for obstacle clearance and that ATC clearance instructions do not infer obstacle or wingtip clearance.

Response

Following the accident the operator responsible for the towing crews immediately issued a notice to all their staff involved in the towing of aircraft and this will be incorporated into the manuals. The notice states that ATC instructions do not guarantee wing tip clearance.

They are also due to conduct a full review of all elements associated with aircraft towing in the organisation, including their safety management.

Status - Accepted - open (Appropriate Action Implemented/Planned)

Boeing 737-59D**Cardiff Airport****21-Feb-2004****Accident****AAIB Bulletin: 4/2005****FACTOR: F18/2005****Synopsis**

The left main landing gear (MLG) began a violent shimmy (yaw oscillation) when the wheelbrakes were applied after a normal landing touchdown, probably damaging the MLG lower torsion link. The shimmying stopped when braking was reduced but restarted when braking was increased, causing the torsion link to fracture. Further higher amplitude shimmying of the left MLG ensued, resulting in severe MLG tyre, wheel and brake damage and substantial oscillatory loads on the aircraft structure. Steering difficulties were experienced during both shimmying episodes.

It was likely that the shimmying resulted from excessive wear of the torsion link apex joint that reduced the effectiveness of the shimmy damper. Maintenance records indicated that the MLG had been maintained in accordance with the manufacturer's recommendations, but it was considered that relevant Aircraft Maintenance Manual (AMM) procedures could be difficult to follow.

Similar failures had occurred over a number of years, which had been attributed by the aircraft manufacturer to excessive apex joint wear that had not been detected or adequately rectified during maintenance.

SAFETY RECOMMENDATION 2004-103

The Federal Aviation Authority and the Boeing Commercial Airplanes Group take appropriate measures aimed at preventing further cases of Boeing 737 main landing gear shimmy and resultant torsion link fracturing brought about by excessive play in the anti-torque links apex joint.

Response**Status - Response Awaited - open****Airbus A320-232****Overhead
Birmingham****29-Nov-2003****Incident****AAIB Bulletin: 11/2004****FACTOR: F52/2004****Synopsis**

On a relatively clear evening, upon reaching the cruise level of Flight Level (FL) 280, the crew and passengers on a scheduled flight from London Heathrow to Edinburgh experienced momentary noise and vibration throughout the aircraft. This was repeated approximately one minute later. It was also reported that an orange flash, associated with the right engine, had been seen. The flight crew identified that No 2 engine had surged and recovered, with the engine indications returning to normal. The aircraft's Quick Reference Handbook, coupled with the training that the flight crew had received, provided them with inadequate guidance with which to fully assess the situation. Their initial intention to continue to Edinburgh was changed upon advice from the operator and the crew initiated a return to Heathrow. The engine then began to surge again and, once more, recovered, but this was followed by another series of surges. At this point the crew believed that the No 1 engine had also surged so they declared a MAYDAY and diverted, uneventfully, to Birmingham Airport. Subsequently, it was determined

that a progressive fault in the No 2 engine P2T2 probe had signalled inaccurate values to the No 2 engine computer, resulting in incorrect scheduling of the compressor inlet guide vanes, and this was a direct cause of the engine surges.

SAFETY RECOMMENDATION 2004-059

It is recommended that Airbus Industrie and IAE review the EEC logic on the V2500 engine fitted to the A320 aircraft, regarding the selection of a temperature source, in the event that the system detects a greater than normally permitted difference between the available sources, so that an erroneous signal is not used for engine control.

Response

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-060

It is recommended that Airbus Industrie review the logic of the Centralised Fault Data Interface Unit (CFDIU) and the Engine Electronic Control (EEC) on A320 aircraft fitted with the V2500 engine, with respect to the Class 3 classification (a fault having no impact on flight safety) of a T2 Sensor Soft Fault (SSF), so that soft faults, such as an erroneous signal, is brought to the attention of flight and maintenance crews at the earliest opportunity.

Response

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-061

It is recommended that Airbus Industrie reviews the ENG 1(2) STALL abnormal procedure for the A320 to reflect the ECAM messages which crews can or cannot expect to see during engine stall events on aircraft fitted with IAE V2500 engines, taking account of the EEC software standard installed.

Response

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-062

It is recommended that Airbus Industrie review the ENG 1(2) STALL checklist, as it appears in their A320 QRH, to ensure that it includes all the advice and information contained in the abnormal procedure for the same event, as laid out in their Flight Crew Operations Manual.

Response

Status - Response Awaited - open

Embraer 145EU	Birmingham Airport	18-Nov-2003	Incident
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AAIB Bulletin: 9/2004

FACTOR: F44/2004

Synopsis

During takeoff at Birmingham, the left inboard main wheel tyre (number 2) shed its tread. The tread had failed as a result of overstress in the sidewall of the tyre, leading to a break up of the tyre casing plies. Air penetrated through the failure in the inner wall of the tyre and then permeated through the casing leading to the tread package lifting from the carcass. The

overstress was attributed to the tyre running under-inflated, which may have been as a result of leakage from the wheel fuse plugs.

SAFETY RECOMMENDATION 2004-027

Goodrich Aircraft Wheels and Brakes Division should carry out research into the possible causes of the fuse plug leakage and consider action to reduce the risk of leaking fuse plugs.

Response

Goodrich has advised that they will issue a temporary revision.

Status - Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2004-028

EMBRAER (Empresa Brasileira de Aeronautica SA) should amend the maintenance schedule for the EMB-145 and similar models, to require that:

- a. Tyre pressures are checked every 24 hours.
- b. The as-found and re-inflation tyre pressures are recorded in the technical log for monitoring purposes.

Response

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-029

The European Aviation Safety Agency should require all wheel repair stations conforming to JARs (Joint Airworthiness Requirements) to inform the tyre re-treader of the reason for removal of the tyre from the aircraft and indicate if there has been any suspicion of the tyre running under-inflated.

Response

Part M and the Acceptable Means of Compliance to Part-M and Part 145 and the Acceptable Means of Compliance to Part-145 address the proposal contained within the recommendation. Additionally, Dunlop Aviation Services introduced a form to provide the retreading agency with the information.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-030

The US Federal Aviation Administration should require all wheel repair stations conforming to FARs (Federal Aviation Requirements) to inform the tyre re-treader of the reason for removal of the tyre from the aircraft and indicate if there has been any suspicion of the tyre running under-inflated.

Response

Status - Response Awaited - open

Embraer 145-EP	Venice Airport, Italy	15-Nov-2003	Incident
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AAIB Bulletin: 9/2004
FACTOR: F43/2004

Synopsis

During takeoff at Venice, the left inboard main wheel tyre (number 2) shed its tyre tread. The tread had failed as a result of overstress in the sidewall of the tyre leading to a break up of the tyre casing plies. Air penetrated through the failure in the inner wall of the tyre and then permeated through the casing leading to the tread package lifting from the carcass. The overstress was attributed to the tyre running under inflated due to an air leak from the overpressure valve. The leak was due to corrosion on the over pressure valve seat form a poor anodised layer during manufacture and a degraded O-ring seal.

SAFETY RECOMMENDATION 2004-023

Goodrich Aircraft Wheels and Brakes Division should amend the Embraer 145 Wheel Component Maintenance Manual to require visual inspection of the inflation and over-inflation valve seat areas at every tyre change.

SAFETY RECOMMENDATION 2004-024

Goodrich Aircraft Wheels and Brakes Division should review the Embraer 145 Wheel Component Maintenance Manual to clarify the requirement to replace the preformed packings (O-ring seals) at each tyre change.

SAFETY RECOMMENDATION 2004-025

Goodrich Aircraft Wheels and Brakes Division should review the use of Dow Corning 33, 55, 4 and Molycote 111 on the silicone rubber preformed packages, determine whether degradation occurs and if so, specify only compatible lubricants.

SAFETY RECOMMENDATION 2004-026

Goodrich Aircraft Wheels and Brakes Division should notify all wheel repair stations of amendments to its Embraer 145 Wheel Component Maintenance Manual arising from these recommendations.

Response

Goodrich has advised that they will issue a temporary revision.

Status - Accepted - open (Appropriate Action Implemented/Planned)

L1011-500 Tristar	London Stansted Airport	19-Aug-2003	Accident
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AAIB Bulletin: 10/2004
FACTOR: F47/2004

Synopsis

During the transit, A/P 'B' had been engaged and, after the 'Approach' mode had been armed, A/P 'A' was also engaged. The aircraft was fully configured with the gear down and with Flap 33 prior to glideslope capture. By 3,000 feet amsl, CS-TMP was fully established on both the

localiser and glideslope. The Autothrottle System (ATS) was already engaged and the speed appeared steady at approximately 150 kt; Vref had been calculated as 145 kt. In accordance with company procedures, at 1,500 feet amsl, the first officer called "Approach and landing, I have control". Then, at about 400 feet radio height, A/P 'A' disengaged and an amber 'NO DUAL' annunciation was displayed on the Avionic Flight Control System (AFCS) warning panel in front of each pilot. The commander instructed the crew to re-engage A/P 'A' and this was done successfully. Around this time, the flight engineer called "three hundred feet". Then, at the decision height (DH) of 100 feet, the flight engineer called "Decide" and the left-seat pilot responded with "Landing, I have control". At 50 feet radio height, the first officer saw 'FLARE' displayed on the AFCS Mode Panel and called this out. At about this time, the left-seat pilot felt the thrust levers retard. The commander's impression was that the aircraft flared as normal but that the flare continued past the normal landing attitude of about 7° nose up. Touchdown was firm and the commander heard a 'metallic' noise from the rear of the aircraft. At about this time, the A/Ps disconnected, the left-seat pilot lowered the nosegear to the runway and then selected reverse thrust on all three engines. On the landing roll, the crew were advised on R/T that the tail of the aircraft had struck the runway on landing. Once clear of the runway, the aircraft was stopped to allow the Airport Fire Service (AFS) to review the damage. The AFS then followed the aircraft to its assigned parking area. An aircraft had been cleared to line-up once CS-TMP had landed. The commander of this aircraft subsequently stated that CS-TMP appeared to be in the landing attitude at about 50 feet agl and that the nose attitude continued to increase until the point of touchdown. He considered that the aircraft landed in a three-point attitude with the tail and the main gear touching the runway simultaneously.

SAFETY RECOMMENDATION 2004-032

The Instituto Nacional de Aviacao Civil Portugal should assure themselves that Air Luxor has in place an appropriate and robust system for the monitoring and co-ordination of maintenance 'trouble-shooting' procedures and the rectification of faults on their aircraft, so that when maintenance is conducted by third party organisations which may be physically distant from the operator's main engineering base, the reliable and safe operation of such aircraft as CS-TMP is assured.

Response

Status - Response Awaited - open

Airbus A320-200	Cardiff International Airport	03-Aug-2003	Incident
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AAIB Bulletin: 2/2005
FACTOR: F5/2005

Synopsis

The aircraft was landing on Cardiff's Runway 30. On finals, the Electronic Centralized Aircraft Monitoring (ECAM) display showed a STEERING caption and the crew cycled the A/SKID & N/W STRNG switch in an attempt to reset the Braking and Steering Control Unit (BSCU). The indications were that it was successfully reset but after touchdown the aircraft did not decelerate normally. The commander pressed the brake pedals to full deflection without effect. He then selected maximum reverse thrust and the co-pilot cycled the A/SKID & N/W STRING switch. The commander again attempted pedal braking, without effect, and the crew selected the A/SKID & N/W STRNG switch to OFF. The commander then braked to bring the aircraft to a halt about 40 metres from the end of the runway, bursting three mainwheel tyres. There was no fire and the passengers were deplaned on the runway through the normal exit doors.

Analysis showed that it took 10 to 13 seconds for the commander to recognise the lack of pedal braking and that there was no overt warning from the ECAM of the malfunction of the BSCU.

SAFETY RECOMMENDATION 2004-082

It is recommended that Airbus improve the automated warnings to flight crews concerning the loss of braking system effectiveness following touchdown or a rejected take-off.

Response

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-083

It is recommended that Airbus amend the Flight Crew Operating Manuals, and related material, to advise application of maximum reverse thrust as soon as a loss of braking performance is suspected following touchdown, rather than delay the application whilst awaiting confirmation that no braking is available.

Response

Status - Response Awaited - open

Incidents Resulting From Damage To Electrical Wiring

AAIB Bulletin: 6/2004
FACTOR: F33/2004

Introduction

A number of accident and incident reports in recent years have identified causal factors that include electrical arcing and damage to aircraft wiring. Significant accidents include a Boeing 747-131, N93119, near East Moriches, New York on July 17, 1996 (TWA 800 - NTSB/AAR-00/03), a Boeing 767-322ER N653UA at London Heathrow Airport on 9 January 1998 (AAIB/AAR 5/2000) and McDonnell Douglas MD-11 HB-IWF near Peggy's Cove, Nova Scotia on 2 September 1998 (Flight 111 - Canadian Report Number A98H0003). Ageing and maintenance related wiring incidents continue to occur despite, generally, an enhanced awareness of the problems associated with aircraft wiring systems. Four such incidents are presented together in this issue of the AAIB Bulletin; all feature damage to electrical wiring and identify similar causal factors. Although each incident is reported separately in AAIB Bulletin 6/2004, this overview document draws together the common issues and makes four additional Safety Recommendations. The four incidents are as follows:

EW/C2002/11/02	Boeing 737-436, G-DOCH	8 November 2002
EW/C2003/05/06	Boeing 737-436, G-DOCE	30 May 2003
EW/C2003/06/03	Concorde Type 1 V102, G-BOAC	13 June 2003
EW/C2003/07/07	Boeing 737-300, G-LGTI	30 July 2003

The Ageing Transport Systems Rulemaking Advisory Committee

Background

In 1996, the US President established the White House Commission on Aviation Safety and Security (WHCSS) which recommended that *'In co-operation with airlines and manufacturers, the FAA's ageing aircraft programme should be expanded to cover non-structural systems.'* The Commission was concerned that existing requirements, procedures, maintenance practices and inspections may not be sufficient to prevent safety related problems caused by the deterioration of aircraft systems, including wiring, as aircraft get older. The findings from this Commission

formed the basis for the FAA Ageing Transport Non-Structural Systems Plan. This acknowledged that both maintenance and design issues should be investigated and, in January 1999, the FAA chartered an advisory committee, the Ageing Transport Systems Rulemaking Advisory Committee (ATSRAC), which included members from the FAA, DoD, NASA, JAA and industry. ATSRAC's primary task was *'to propose such revisions to the Federal Aviation Regulations (FAR) and associated guidance material as may be appropriate, to ensure that non-structural systems in transport airplanes are designed, maintained, and modified in a manner that ensures their continuing operational safety throughout the service life of the airplanes.'* The initial priority was given to electrical wiring systems.

Visual inspection was carried out on a number of in-service aircraft types and showed 'deterioration of electrical wire, wire bundles, earthing leads, clamps and shielding. Items such as improper clamp sizing, inadequate clearance to structure and accumulation of dust or debris were also common. Isolated cracking of outer layers of multi-layer electrical insulation and corroded electrical connectors were also found. The majority of the wiring discrepancies were found to be in areas of frequent maintenance activity, or related to housekeeping. Fluid contamination, dust and dirt accumulations were seen on the wiring on most of the aircraft.'

In light of these findings, a number of areas were identified as meriting attention; these included new design requirements to mitigate known problems due to ageing, which will cover wire accessibility provisions and wire selection, and wire installation to minimise strain and to provide protection from damage.

A draft FAA Advisory Circular (AC), dated 15 July 2002, was produced which provides guidance on changes to existing maintenance practices and analysis methods which could be applied to both in-service aircraft and new design, to ensure adequate consideration of the potential deterioration of electrical wiring systems. An important element of this AC is an enhanced zonal analysis procedure (EZAP), which has been adopted into the latest revision of the Air Transport Association of America (ATA) Maintenance Steering Group (MSG) guidelines, MSG-3. This AC also identifies protection and caution information to be added to maintenance instructions designed to minimise contamination and accidental damage to electrical wiring whilst working on aircraft.

Another draft AC, dated 2 August 2002, provides guidance to manufacturers, operators, maintenance organisations and repair stations for developing an effective wiring systems training programme. This AC promotes the philosophy of training for all personnel who come into close proximity with wiring as part of their job and proposes tailoring of the training for each workgroup according to their needs. It also gives guidance on all essential elements of both initial and recurrent wire training programmes.

A further draft AC, dated 31 October 2002, gives advice on developing an electrical systems standard wiring practices manual. The information in this AC is derived from maintenance, inspection, and repair best practice and promotes a common format and minimum content for documents containing standard practices for electrical wiring.

ACs provide guidance material and the FAA proposes to publish all these ACs in the Federal Register.

The FAA is also proposing publishing the Notice(s) of Proposed Rulemaking (NPRM), by January 2005, for the package of 'ageing systems' Rules. Existing Type Certificate holders are likely to be given 24 months after the Rule goes into effect for completion of the EZAP analyses, development of the required inspection and maintenance instructions, and their incorporation into the Instructions for Continued Airworthiness. Operators would then have a further 12 months to incorporate the required inspection and maintenance instructions into their maintenance procedures and initiate EZAP according to the enhanced maintenance programme. To ensure early attention to the three areas identified by ATSRAC as being of particular importance, ATSRAC advised the FAA to require a one-time cleaning and inspection of the cockpit, Electrical & Equipment bay, and power feeder cables within five years after the rule goes into effect. However, in order to avoid unnecessary increases in maintenance downtime, the FAA are considering not to require a one-time cleaning and inspection of these areas. Instead, these areas would receive the required attention at the appropriate periods defined by the EZAP analyses.

In further work conducted under ATSRAC, there is a general objective to develop strategies for technology transfer and implementation of the FAA research and development (R&D) products into the aviation community. The initial focus will be on Ageing Circuit Breaker recommendations and Arc Fault Circuit Breaker implementation.

European Ageing Systems Coordination Group

On 28 September 2003 the European Aviation Safety Agency (EASA) came into being and assumed responsibility for the certification and continued airworthiness of most aircraft manufactured and operated within the European Union. This responsibility includes continued airworthiness of all aircraft types covered by the ATSRAC work. The JAA, working on behalf of EASA, have recently started the European Ageing Systems Coordination Group (EASCG), which has the task of transcribing all the ATSRAC proposals into the European arena. The UK CAA chairs the EASCG, and it is highly likely that material in the FAA ACs will be adopted for use throughout the EU.

Damage to wiring

The visual inspections carried out by ATSRAC showed that aircraft wiring deteriorates with time and, particularly, in areas subject to high levels of maintenance activity. This is reflected in the incident to G-BOAC, where the airworthiness issues highlighted are not limited to Concorde, which is no longer in service, but reflect broader concerns on all aircraft types regarding wiring maintenance, particularly as aircraft age and modifications are introduced. The possibility for a wire to chafe was introduced during a maintenance input two years prior to this incident, when the wiring was last disturbed. This ultimately led to a short duration in-flight fuel fire.

Similar factors were identified in the incident to a B737, G-DOCH, where a maintenance input led to the mis-routing of the water supply line. This resulted in abrasion between the wires and the hose, and in the shorting and severing of a number of the wires. The hose was too long for this application and the excess length had been looped through the overhead area and then secured by a tie-wrap to adjacent wire bundles. It was most likely that this was simply a short-term expedient while systems were being disconnected and disassembled and that the 'temporary' tie-wrap was then missed during reassembly.

Loss of the pressurisation system on another B737, G-DOCE, resulted from the abrasion of the insulation of two or more wires in the affected loom. As in the other incidents, there was the possibility that the loom may have been damaged whilst maintenance was carried out in the area, and that this may have started the process which led to the conductors being exposed.

The incident to B737 G-LGTI occurred prior to flight, when the flight crew became aware of an electrical burning smell and smoke. The aircraft was shut down and the passengers evacuated. Pre-existing damage to the electrical galley feeder cables was identified which provided for the possibility of electrical arcing. It is probable that the damage to these cables occurred at an earlier time, possibly during the replacement of the forward toilet service panel.

All these incidents show how prone electrical wiring is to damage, occurring over time or being introduced during maintenance or modification action. Periodic zonal inspections are carried out but damage and debris is often hidden within wiring bundles and is difficult to detect without disturbing the looms. The draft ACs, generated by the ATSRAC work, address wiring standards issues of the type identified by these incidents, notably by the EZAP procedure, and this has been adopted into the latest revision of MSG-3 guidelines. However, the draft ACs have not yet been published, despite draft documents having been developed and issued by ATSRAC in 2002.

Therefore the following recommendations are made:

SAFETY RECOMMENDATION 2004-018

It is recommended that the Federal Aviation Administration (FAA) accelerate the publication and adoption of the guidance material produced by the Ageing Transport Systems Rulemaking Advisory Committee (ATSRAC) on developing an electrical systems standard wiring practices manual, developing an effective wiring systems training programme and on changes to existing maintenance practices and analysis methods, which could be applied to both in-service aircraft

and new design, to ensure adequate consideration of the potential deterioration of electrical wiring systems.

Response

Response - Awaited - open

SAFETY RECOMMENDATION 2004-019

It is recommended that the European Aviation Safety Agency (EASA) expedite the transcription by the European Ageing Systems Co-ordination Group (EASCG) of the material in the FAA Advisory Circulars (ACs) produced by the Ageing Transport Systems Rulemaking Advisory Committee (ATSRAC), which gives guidance for operators and maintenance organisations on developing an electrical systems standard wiring practices manual, developing an effective wiring systems training programme and on changes to existing maintenance practices and analysis methods. This guidance should be applied to both in-service aircraft and new designs, to ensure adequate consideration is given to potential in-service deterioration of electrical wiring systems.

Response

EASA continues to be an active participant in the ageing systems rulemaking process. Publication of a Notice of Proposed Amendment (NPA) is expected by the end of 2005. It is estimated that publication of final text will be by the end of 2006. This final text should require a Type Certificate holder to provide enhanced Instructions for Continued Airworthiness (ICAW), by mid 2008 and aircraft operators implementation by mid 2009.

Status - Partially Accepted - open

Circuit breaker design

However strenuous the efforts to avoid design and maintenance quality lapses, their essentially random natures make them very difficult to eliminate. There are many reports of wiring loom damage where sustained arcing within/between looms occurred, or probably occurred, where CBs have failed to operate, or to operate in sufficient time to prevent serious wiring damage and, in some cases, loss of the aircraft. The four incidents reported here present such examples of sustained arcing.

Electrical circuits are protected against electrical overheating of wires by thermal/mechanical types of circuit breaker. The 'thermal trip' type of circuit breaker is tripped, and thus the electrical circuit broken, by heat generated within the breaker from the current in excess of its rating. This is most suitable for a 'solid' and continuous short-circuit but less reliable for transient arcing faults, which develop high energy over a very short period of time insufficient to trip the circuit breaker. An 'intelligent' circuit breaker, which could directly replace the circuit breakers presently in widespread use, can recognise the rapid current and/or voltage signature associated with arcing faults. An extensive research programme has been sponsored entirely by the FAA, and has led to the development of such arc fault circuit breakers.

The findings of the ATSRAC research has shown that aircraft wiring does deteriorate with time. If wiring insulation material becomes damaged in some way, for example due to mechanical abrasion, so that the wire is exposed and a local external conductive path is available, then electrical arcing can occur. In response to previous incidents and accidents where arcing has been identified, and with regard to the development of arc-fault circuit breakers, the following recommendations are made:

SAFETY RECOMMENDATION 2003-108

It is recommended that the Federal Aviation Administration (FAA) expedite a requirement for the replacement of existing thermal/mechanical type circuit breakers by arc fault circuit breakers, in appropriate systems on in-service and new build Civil Air Transport aircraft for which they have issued type certificates, when these devices are judged to have been developed to an acceptable standard and where the Safety Objectives for the circuits would be enhanced.

Response

Response - Awaited - open

SAFETY RECOMMENDATION 2003-128

It is recommended that European Aviation Safety Agency (EASA), on behalf of the member countries which have issued type certificates for Civil Air Transport aircraft, expedite a requirement for the replacement of existing thermal/mechanical type circuit breakers by arc fault circuit breakers, in appropriate systems on in-service aircraft and new build aircraft, when these devices are judged to have been developed to an acceptable standard and where the Safety Objectives for the circuits would be enhanced.

Response

EASA continues to be an active participant in the ageing systems rulemaking process. Industry continues to develop arc fault circuit breaker technology. A regulatory impact assessment will need to be performed before action may be taken.

Response - Partially Accepted - open

Airbus A310-308	Manchester Airport	15-Jul-2003	Incident
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AAIB Bulletin: 3/2004
FACTOR: F17/2004

Synopsis

Following a technical problem, the airbridge on Stand 6 at Manchester Airport could not be parked in the correct position. From the remote location of Apron Control, the stand allocator was unaware that Stand 6 was obstructed and so allocated it to an arriving A310 aircraft. Although, irrespective of the position of the airbridge, a marshaller was required to guide the aircraft on to the stand, the stand allocator also activated the Stand Entry Docking Guidance (SEDG) lighting. The marshaller arrived at the stand when the A310 was already manoeuvring to park and following the illuminated SEDG. Neither the aircraft commander nor the marshaller noticed that the airbridge was incorrectly parked until it was too late to prevent the upper surface of the aircraft's left engine cowling striking the underside of the airbridge as the marshaller signalled the aircraft to stop.

SAFETY RECOMMENDATION 2003-131

Manchester Airport plc should ensure that Stand Entry Docking Guidance lighting is not activated by Apron Control until a positive communication has taken place with staff at the stand confirming that the stand is clear. Until the aircraft has parked and shut down its engines, those staff should remain available at the stand to inform Apron Control if the stand subsequently becomes obstructed.

Response

Manchester Airport plc has made budgetary provision for SEG modifications so that it will comply with this Safety Recommendation.

Actions to date have included investigations into the engineering and electronic functions of its current SEG systems. We have included all three terminals in the investigation, having concluded at an early stage that it can make improvement to safety standards by including terminal 2 along with terminal 1 & 3, in the scope of proposed works.

Status - Accepted - closed

SAFETY RECOMMENDATION 2003-132

For the airbridges and stands serving Terminals 1 and 3, Manchester Airport plc should, within a reasonable timescale, fund and develop Stand Entry Docking Guidance lighting controls and associated procedures that comply with the advice and guidance contained in Civil Aviation Publication (CAP) 642.

Response

Manchester Airport plc has now made budgetary provision for SEG modifications so that it will comply with this Safety Recommendation.

Actions to date have included investigations into the engineering and electronic functions of its current SEG systems.

It has included all three terminals in the investigation, having concluded at an early stage that it can make improvements to safety standards by including terminals 2 along with terminal 1 & 3, in the scope of proposed works.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-008

The UK Civil Aviation Authority should consider including within future audits of UK aerodromes compliance with CAP 642 advice in respect of the control and use of Stand Entry Docking Guidance systems.

Response

The Aerodrome Standards Department of the Civil Aviation Authority has included a review of Stand Entry Docking Guidance systems and associated procedures, to ensure conformity with CAP 642 advice, in its forthcoming aerodrome audit programme.

Status - Accepted - closed

Boeing 777- 236B	Near Reigate, Surrey	26-Jun-2003	Accident
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AAIB Bulletin: 3/2005
FACTOR: F13/2005

Synopsis

A large access door, measuring 4 x 6 feet and weighing 70 lb, detached from the aircraft shortly after takeoff from Gatwick Airport, causing substantial damage to two cabin windows and minor damage to the fuselage and fin. Fragments of the door penetrated into the cabin and large parts of it landed close to persons on the ground. It was likely that only one of the thirteen door catches had been fastened and that the door had suffered overload failure due to aerodynamic forces as the aircraft accelerated, allowing it to open and detach. Multiple walk-round inspections of the aircraft by different personnel had failed to detect the open catches. The inadequate fastening had apparently occurred during a routine maintenance check due to a deviation from standard procedures; a practice that reportedly had been fostered by features of the maintenance system and may have been commonplace. It appeared likely that the human performance factors evident in this event could be affected beneficially by improvements in the operator's maintenance and inspection systems.

SAFETY RECOMMENDATION 2004-077

It is recommended that British Airways, when reviewing their maintenance inspection and management systems and practices should consider:

- (a) reviewing work packs to ensure that no duplicate or unnecessary tasks are specified;
- (b) combining access panel opening and re-securing actions during maintenance with the associated maintenance task on a single work card;
- (c) including on work cards illustrations indicating access panel locations;
- (d) additional measures to ensure the re-securing of access panels after maintenance;
- (e) measures aimed at ensuring that access panel latch pads wear is rectified before it becomes excessive and,
- (f) examining the possible benefits of varying the walk-round direction for some of the multiple airframe inspections.

Response

- a) Reviewing work packs to ensure that no duplicate or unnecessary tasks are specified.

British Airways Engineering have already reviewed their Maintenance Programmes during an MPD alignment project and continue to minimise the duplication of tasks on work cards on an on-going basis. However, sometimes tasks are duplicated by the inclusion of additional routine and non-routine tasks created by modification programmes or unscheduled jobs task cards.

Work packages for modifications and unscheduled tasks are designed as stand-alone work packages to ensure they can be completed and certified in a variety of situations within line, minor and major maintenance. British Airways consider that it would not therefore, be appropriate to remove work cards from these packages in order to avoid card duplication and such an action would introduce another issue regarding incomplete work instructions in these stand-alone packages.

British Airways recognise the issue and minimise task card duplication so far as is practicable, but feel it is not possible to completely eliminate it.

LAEs and Technical Engineers are aware that duplication of tasks will sometimes occur and address this by cross-referencing during task preparation. The introduction of SAP will further improve the management of duplicate cards for networked maintenance inputs.

- b) Combining access panel opening and re-securing actions during maintenance with the associated maintenance task on a single work card.

The ADP access panel involved in this event creates a maintenance issue in the requirement for it to be closed prior to moving of the flaps, potentially leading to it being temporarily shut as in this incident.

It is conventional Production Engineering practice to have main tasks broken down into separate sub tasks in the following manner - Gain Access - Inspect/Change - Repair/Replace - Clearance to Fit - Close - etc. This puts individual sub tasks in an allotted sequence within a check and ensures that there is a concentration to phase relevant tasks at the appropriate time.

This process conforms to ATA specification as industry standard for completing Service Bulletins and Modifications, as well as routine maintenance tasks.

British Airways state that there is a concern that in having all items on one task card it would need to be physically moved around on completion of the various phases of the check, and there is a risk of misplacing the task card if moved around on docking as the check is progressed. This is especially the case for panels where multiple stages exist between panel opening and final closure, and therefore these tasks cannot be completed until much later in the check resulting in the possibility of cards being missed or lost.

For the vast majority of panels on the aircraft, the combining of these tasks would not be appropriate as it would undoubtedly lead to duplicated task cards and create a greater safety risk. However, Engineering have previously introduced a post maintenance reliability check (form X1433) at Heathrow to ensure that items disturbed during a check are given a final reinstatement confidence check on departure from the hangar. This check has now been introduced at Gatwick to offset the risk of further events following maintenance.

c) Including on work cards illustrations indicating access panel locations.

Recommendation reviewed and agreement that panel location diagrams are made available at work locations.

The work cards themselves do not facilitate the printing of detailed drawings and extended detailed instruction. Reference is made on work cards to any detailed requirements that are found in the Approved Maintenance Manual.

Engineers are encouraged to use the AMM (chapter 6), which is electronically available in all work locations. In addition, technical information is circulated via the Tech News process, which is strictly controlled and each engineer is personally accountable and monitored for regular access to this information. Further information is also available at hangar level from hard copy panel diagramme manuals which are controlled Approved Technical Publications (ATP2748 for B777 refers).

British Airways considered that panel identification was not an issue in this event, however, Engineering Quality are conducting audits to ensure that appropriate panel diagrams are available in the work areas.

d) Additional measures to ensure the re-securing of access panels after maintenance.

British Airways have recognised that certification culture and process is a significant issue in many maintenance lapses including the re-securing of access panels. To this end British Airways has begun a number of programmes to address the issue including:

- taking all certifying LAEs through a presentation on learning from previous incidents
- a review of the supervisory role within maintenance
- the creation of a Maintenance Safety Group to bring production management and LAEs together to address maintenance lapses and other safety issues

In addition to this work, British Airways stated that it would also be beneficial to review the certification process and working practices to ensure, where practical, that the completion of the task and its certification by the individuals concerned is inextricably linked.

e) Measures aimed at ensuring that access panel latch pads wear is rectified before it becomes excessive.

The pad wear issue is already subject to manufacturer's Service Bulletin inspection action under number 777-53-0040 based on operators experience of latch wear.

An initial fleet inspection was completed followed by a subsequent fleet check, EOD777-532449X – completion mid August 2005, for comparison purposes to assess the rate of degradation.

Latch pad wear was not a factor in the loss of the panel and British Airways are unaware of any panel loss case where this has been a factor, however the results from the above checks is under review and a Maintenance Programme change is in process for a routine inspection of the latches.

f) Examining the possible benefits of varying the walk-round direction for some of the multiple airframe inspections.

Whilst a walk-round check cannot be relied upon to detect maintenance lapses, it is accepted that the numerous checks that were performed on this aircraft could reasonably be expected to have picked up the unfastened catches. British Airways will therefore examine the complete

range of walk-round checks performed on the aircraft with a view to provide a clearer focus regarding task differences to improve their overall reliability and efficiency. In addition emphasising the requirements of a walk-round inspection to engineers, pilots and ground handling staff during training will help to reduce the risk of an unfastened panel remaining undetected.

Status - Accepted - closed

Airbus A320-200	Bristol Lulsgate Airport	16-Jun-2003	Accident
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AAIB Bulletin: 11/2004

FACTOR: F50/2004

Synopsis

The aircraft and pilots were normally based in Canada but were operating for a six month period over the summer from Bristol Airport as part of a wet-lease agreement. The inexperienced co-pilot had been undergoing a protracted period of line training and had been rostered to fly on four consecutive days with the same line-training captain. They had agreed that should a suitable opportunity present itself, the co-pilot would practise flying the aircraft without the autopilot, autothrust and flight directors being engaged. On the third day the co-pilot flew the ILS approach to Runway 09 at Bristol with the aircraft configured in this condition. At touchdown the aircraft bounced and on touching down a second time, the tail contacted the ground.

SAFETY RECOMMENDATION 2004-055

Skyservice Airlines should review its policy for pilots' competency and experience requirements both before and during conversion training.

SAFETY RECOMMENDATION 2004-056

Skyservice Airlines should review its procedures for the training and supervision of training captains.

Response

Following their preliminary investigation of this accident, Skyservice implemented several Safety Actions in order to prevent a reoccurrence. These actions included:

- Flight Operations Bulletin 2003-77 was issued to address:
- Use of Autothrust
- Speed Monitoring
- Use of the Takeover Pushbutton
- Pilot training (ground and simulator) now includes increased emphasis on:
- Bounced landing recovery
- Flight control takeover
- Low energy awareness
- Pitch and airspeed monitoring during approach and landing

- The Training Pilot program is presently being modified to include increased training and oversight.
- Skyservice have implemented a new pilot recruitment standard.

Status - Accepted – closed

SAFETY RECOMMENDATION 2004-057

Airbus should highlight to airlines the need for pilots to press the sidestick priority button when intervening to correct an erroneous control input by the handling pilot.

Response

Airbus advise that this is written in the FCOM (Flight Crew Operating Manual), SOPs (Standard Operating Procedures), Chapter 3.3.1 and is also emphasised during training. A presentation on tailscape avoidance was planned for the next flight safety conference.

Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2004-058

Airbus Industrie should introduce an aural warning to its fly-by-wire aircraft types to alert pilots of excessive pitch angle or excessive pitch rate during landing.

Response

Airbus have developed, on the A340-500 and A340-600, a system giving a visual indication on the PFD and an aural warning in case of excessive pitch angle. They are now studying the feasibility to extend this on all other fly-by-wire aircraft types.

Status - Response Awaited - open

HS125-700A	London Luton Airport	13-June-2003	Incident
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AAIB Bulletin: 6/2004
FACTOR: F28/2004

Synopsis

The aircraft suffered an uncontained failure of the right engine, at 60 kt during the take-off roll, on Runway 26 at Luton Airport. The takeoff was abandoned, the engine was shutdown and the aircraft taxied clear. Subsequent examination revealed high cycle fatigue failure of the 1st stage Low Pressure Turbine (LPT) disc.

The engine had undergone a Major Periodic Inspection (MPI) and Compressor Zone inspection some 107 hours before the incident. This identified the requirement to replace the LPT 1 disc and nozzle assembly. The replacement LPT 1 disc was a new item from the manufacturer. The replacement nozzle assembly, manufactured as a one piece ring of 67 vanes, was an item overhauled by an FAR Part 145 approved repair station, not on the manufacturer's list of authorised organisations, operating under a Designated Engineering Representative (DER) system. During overhaul the nozzle assembly is 'tuned' by deflecting the trailing edges of individual vanes, opening or closing the area of each nozzle throat, to ensure the correct total effective area of the nozzle ring. A computer programme called 'NAPOLI', developed by the manufacturer in response to previous fatigue failures of nearly-new discs, fed with flow rig measurements and the measured distances between vanes, calculates the vane deflection required and which vanes need adjusting.

Inappropriate nozzle adjustment could create LPT 1 disc resonance initiating and propagating fatigue. Service Bulletins (SBs), issued by the manufacturer, detailed instructions for correct nozzle adjustment and highlighted the possible consequences if this was not carried out correctly. The repair station, not being authorised by the manufacturer, were not aware of the contents of the SBs and were ignorant of the manufacturer's requirement for vane adjustment and the 'NAPOLI' programme.

SAFETY RECOMMENDATION 2004-034

The Federal Aviation Administration should ensure that 'FAR Part 145' repair stations are in possession of all the manufacturer's documentation covering the tasks for which they are approved.

Response

FAA Flight Standards Service AFS-1 wrote to the FAA Director of Accident Investigation on 5 Nov 2004 stating:

The Flight Standards Service has evaluated this safety recommendation and has determined that it is captured in Title 14 Code of Federal Regulations, part 145, section 145.109(d), which reads as follows:

"A certificated repair station must maintain, in a format acceptable to the FAA, the documents and data required for the performance of maintenance, or alterations under its repair station certificate and operations specifications in accordance with part 43." The following documents and data must be current and accessible when the relevant work is being done:

- (1) Airworthiness Directives
- (2) Instructions for continued airworthiness
- (3) Maintenance manuals
- (4) Overhaul manuals
- (5) Standard practice manuals
- (6) Service bulletins, and
- (7) Other applicable data acceptable to or approved by the FAA.

The FAA has considered this recommendation and plan no further action.

The FAA Office of Accident Investigation convened a Safety Recommendation Review Board to review this response and as a result the Review Board classified the recommendation as "Closed - Not Adopted"

Status - Rejected - open

Boeing 737-436	In flight near Lyon, France	30-May-2003	Incident
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AAIB Bulletin: 6/2004
FACTOR: F28/2004

Synopsis

Whilst in the cruise the crew began to feel some discomfort in their ears. This was shortly followed by the cabin altitude warning horn which indicated that the cabin altitude had exceeded 10,000 feet and this was seen to continue to climb on the cockpit gauge. At the same time, the primary AUTO mode of the pressure control failed, shortly followed by the secondary STBY mode. The crew selected the first manual pressure control mode, but were unable to control the

cabin altitude. An emergency descent and subsequent diversion to Lyon was carried out. The failure of the pressurisation control system was traced to burnt electrical wiring in the area aft of the aft cargo hold. The wiring loom had been damaged by abrasion with either a p-clip or 'zip' strap that, over time, resulted in the conductors becoming exposed, leading to short circuits and subsequent burning of the wires. There was no other damage. The wiring for all the modes of operation of the rear outflow valve, in addition to other services, run through this loom.

SAFETY RECOMMENDATION 2004-033

It is recommended that in order to prevent failure of the cabin pressure control system in the event of damage to wiring loom W298, the Boeing Commercial Airplanes should consider, on the Boeing 737-436 and similarly configured models, separating or protecting the wiring associated with the different modes of operation of this system, which connects the cabin pressure controller to the rear outflow valve, such that any single point failure of the loom would not result in effective failure of the pressurisation control system.

Response

Status - Response Awaited - open

Airbus A321 - 231	Approx 70nm south-east of Vienna	26-May-2003	Incident
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AAIB Bulletin: 6/2004
FACTOR: F30/2004

Synopsis

The aircraft was in the cruise at FL340 approximately 70 nm south-east of Vienna when it encountered an area of severe turbulence and hail. Some of the flight deck windows became crazed and other areas of the airframe suffered extensive damage although this was not apparent to the crew. The aircraft made a precautionary descent to FL230, in accordance with the required abnormal procedures, and continued the flight to its destination of Manchester. The crew had no indication or warning that the aircraft was about to enter an area of severe turbulence, associated with the upper levels of a Cumulo-nimbus cloud. When they had been using the weather radar to check the route ahead of the aircraft, sometime before the encounter, the radar returns appeared benign.

SAFETY RECOMMENDATION 2004-047

The Civil Aviation Authority should consider reviewing their guidance material concerning the use and interpretation of airborne weather radar, with a view to highlighting the potential for displayed data to be unreliable when used for calculating the safe vertical clearance for overflight of active storm cells.

Response

The CAA has reviewed the guidance material contained in Aeronautical Information Circular (AIC) 72/2001 entitled 'The Effect of Thunderstorms and Associated Turbulence on Aircraft Operations' and has amended and updated it as necessary. In particular it covers the subject of the use and interpretation of airborne weather radar with regard to calculating the safe vertical clearance for the overflight of active storm cells. This includes highlighting the potential for the displayed data of the weather radar to be unreliable when used for these calculations.

The revised AIC will be published on 19 August 2004.

Status - Accepted - closed

BAe 146 - 300	In the cruise, near Carlisle, Cumbria	02-Mar-2003	Incident
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AAIB Bulletin: 7/2004
FACTOR: F40/2004

Synopsis

The aircraft suffered a lateral flight control restriction as a result of loose insulation material becoming trapped in the aileron control circuit. The crew carried out the memory items for the 'AILERON JAM OR UNCOMMANDED ROLL' checklist, but did not realise that in addition to pulling the Aileron Disconnect Handle there was also a need to apply a breakout force to the control wheel to achieve the disconnect.

SAFETY RECOMMENDATION 2004-013

It is recommended that the Civil Aviation Authority ensure that BAE Systems make a suitable revision to the entries relating to the aileron disconnect systems in all sections of the Avro RJ and BAe 146 Manufacturer's Operating Manuals to clarify the systems operation and associated procedures.

Response

The CAA accepts this recommendation and have already required BAE Systems to review and make appropriate amendments to the BAe 146 and AVRO RJ documentation for all entries relating to the aileron disconnect systems. The target date for an agreed solution to address this Safety Recommendation is December 2004.

CAA Action

A solution was agreed at a meeting with BAE Systems on 21 September 2004. Aircraft Flight Manual changes, published as Temporary Revision 92 in February 2005, (on which Manufacturer's Operating Manuals are based) introduce new drills relating to the aileron disconnect systems.

Status - Accepted - closed

Swearingen SA227-AC Metroliner	Aberdeen Airport	24-Dec-2002	Accident
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AAIB Bulletin: 6/2004
FACTOR: F34/2004

Synopsis

On a positioning flight, with the co-pilot as handling pilot, the crew detected a right engine failure shortly after takeoff from Runway 16 at Aberdeen Airport. The commander feathered the right engine but did not raise the landing gear. The aircraft descended and the co-pilot was unable to prevent the aircraft from impacting the ground, some 500 metres to the right of the runway. During the subsequent ground slide, the aircraft entered a public road and collided with a moving car.

Bird remains were found on Runway 16 and evidence was found to indicate that the left engine had ingested birds. There was no indication of any bird ingestion by the right engine and no defect with that engine was identified during the investigation. Lack of adherence to the Joint Aviation Requirements - Operations (JAR-OPS), was identified, relating to the FDR system and to crew training.

SAFETY RECOMMENDATION 2004-031

The Joint Airworthiness Authorities should ensure that accident flight data recording systems fitted to aircraft that are required to be fitted with a Flight Data Recorder under the terms of JAR-OPS sample and record normal acceleration data at a rate of no less than eight times per second.

Response

CAA comments - the CAA sent a copy of AAIB Bulletin 6/2004 to the Chairman of the JAA Flight Recorder Study Group (FRSG) on 16 June 2004. The FRSG was requested to give consideration to Safety Recommendation 2004-31 at their next meeting in September 2004.

The JAA has sent a letter to the National Aviation Authorities suggesting that the type of flight data recorder fitted to the accident aircraft type, not be deemed acceptable.

Status - Accepted - closed

BAe 146-200	During climb from Birmingham to Belfast City	12-Dec-2002	Accident
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AAIB Bulletin: 2/2004
FACTOR: F11/2004

Synopsis

The aircraft was carrying out a scheduled passenger flight from Birmingham to Belfast City. During the climb, it appeared to hunt in pitch more than usual whilst the autopilot was engaged and it seemed to the flight crew that it would fail to maintain FL240, their cleared cruising level. When the autopilot was disconnected, the aircraft pitched up and the elevator control forces to counteract this were found to be very heavy. Nose down trim was applied, which caused the aircraft to pitch down. In an attempt to level the aircraft, both pilots then pulled back on the control columns with considerable force. The controls suddenly freed causing the aircraft to pitch up rapidly, resulting in a large excursion in normal acceleration which caused serious injuries to two cabin crew members.

The investigation determined that the accident was probably caused by icing of the elevator servo tabs, coupled with the crew's response to the situation for which they had not been trained.

There have been a number of previous occurrences of suspected servo tab icing on the BAe 146/RJ aircraft series.

SAFETY RECOMMENDATION 2003-119

It is recommended that the Civil Aviation Authority require operators of aircraft with non-powered flying controls that are vulnerable to the effects of freezing of re-hydrated de-icing fluid residues, to establish engineering procedures for the inspection and removal of such residues from critical flying control surfaces.

Response

The CAA believes that operator procedures for the inspection and cleaning of re-hydrated de-icing fluid residues must be based on formal information from the applicable Type Certificate Holder/Type Design Organisation.

Since 28 September 2003, responsibility for the matters addressed in this Safety Recommendation as far as they relate to TC holders has passed to EASA under Regulation (EC) 1592/2002 and the recommendation should be addressed to that Agency.

Under the EASA transition arrangements and as the regulator within the State of Design for a number of aircraft types with no-powered flying control systems, CAA accepts this recommendation on behalf of EASA. CAA will therefore review the applicable UK aircraft types, and those types for which CAA is the EASA Lead Authority, with the Type Certificate Holders and where necessary require the development, approval and publication of such information and require operators to incorporate this information into their procedures. CAA will recommend the same action to EASA for any other applicable type.

The CAA has set a target date of September 2004 to complete this action.

CAA Action

Information for the inspection and removal of de-icing/anti-icing fluid residues has been developed by BAE Systems for the BAE146, and where appropriate reviewed and approved by CAA.

This information has been published in the following BAE documents: AFM Temporary Revision 92 (see also SR 2004-13 & 2003-120) Aircraft Maintenance Manual (rev. Dec 05) chapter 12-30-31 - Frost, Ice and Snow Removal. Manufacturers Operations Manual - Notice to Aircrew: Operational Notice OP 25 Issue 1 - Operations in Icing Conditions Service Information Leaflet ATA-27/80 Issue 2 Various general information publications on winter operations were also updated, e.g. "Plane Freezing".

In respect of other aircraft types with non-powered flying control systems for which CAA is the State of Design or responsible party on behalf of EASA a review has been started with the intent to place actions with the relevant Type Certificate holders by end of June 2005. EASA has been made aware of CAA actions on these types and a recommendation has been made to carryout the same actions on other types for which CAA is not responsible.

Status - Accepted - closed

SAFETY RECOMMENDATION 2003-120

On behalf of EASA the CAA should take an oversight on the manufacturer's proposed flight crew abnormal and emergency checklist procedure for recognising and responding to frozen flight controls on the 146/RJ series aircraft to ensure the timely introduction of a suitable procedure.

Response

Since 28 September 2003, responsibility for the matters addressed in this Recommendation has passed to EASA under Regulation (EC) 1592/2002 and the recommendation should be addressed to that Agency.

Under the EASA transition arrangements and as the regulator within the State of Design for the BAE146 aeroplane type, CAA accepts this recommendation on behalf of EASA.

The CAA is monitoring the manufacturer's actions relating to possible amendments to the flight crew abnormal and emergency procedure, for recognising and responding to frozen flight controls on the 146/RJ series aircraft. It is intended that this work will be completed by 31 December 2004.

CAA Action

Revised emergency and abnormal procedures for pitch or roll control problems have been agreed with the manufacturer. These have been introduced into the Flight Manuals of the 146/RJ series aircraft following their approval by EASA on 9 February 2005.

Status - Accepted - closed

SAFETY RECOMMENDATION 2003-121

The aircraft manufacturer, BAE Systems, should alert operators of 146/RJ series aircraft to the possibility of precipitation accumulating in the elevator gaps whilst the aircraft is parked in near freezing conditions, or following a hailstorm, and that if untreated, this precipitation can lead to pitch control problems in flight.

Response

BAE Systems issued a Notice to Aircrew (NTA OP 25) dated on 8 Jan 04 and changes to the Manufacturer's Operations Manual also dated 8 Jan 04 which covered this issue.

Status - Accepted - closed

SAFETY RECOMMENDATION 2003-122

The CAA should require UK AOC holders operating BAe 146/RJ series aircraft to issue instructions to their staff for inspecting the gaps between the elevator and the tailplane and between the elevator and the trim and servo tabs for any precipitation contamination prior to departure, with a recommendation to de-ice the aircraft, when any doubt exists.

Response

This recommendation, as worded, is directed at the CAA oversight of UK AOC operators.

The CAA believes that operator procedures for the inspection of contamination must be based on formal information from the applicable Type Certificate Holder/Type Design Organisation.

Since 28 September 2003, responsibility for the matters addressed in this Safety Recommendation as far as they relate to the TC holder has passed to EASA under Regulation (EC) 1592/2002 and the recommendation should be addressed to that Agency.

Under the EASA transition arrangements and as the regulator within the State of Design for the BAe 146 and AVRO 146-RJ aircraft types, CAA accepts this recommendation on behalf of EASA. CAA will therefore require the Type Certificate Holder of the BAe 146 and AVRO 146-RJ aircraft types to develop, obtain approval and publish such information and require operators to incorporate this information into their procedures.

The CAA has set a target date of September 2004 to complete this action.

CAA Action

In early 2004 BAE Systems developed and issued Service Information Leaflet SIL 27-80 covering the maintenance and de-icing of flight controls. This included information on:

The importance of removing frozen contaminants from control gaps. Removal of de-ice fluid residues from aerodynamically quiet areas where there is insufficient airflow to ensure this. The use of approved de-icing fluids per the Aircraft Maintenance Manual (AMM) Deterioration of "sealed for Life" bearings. Preventative maintenance to prolong the life of such bearings.

Information for the detection and clearance of contamination of the tailplane was later developed by BAE Systems. This information has been published in the following documents: Aircraft Maintenance Manual (rev. Dec 05) chapter 12-30-31 – Frost, Ice and Snow Removal. Manufacturers Operations Manual – Notice to Aircrew: Operational Notice OP 25 Issue 1 – Operations in Icing Conditions Service Information Leaflet ATA-27/80 Issue 2.

Various general information publications on winter operations were also updated, e.g. "Plane Freezing".

This documentation provided instructions to operators in order that they manage their aircraft as appropriate to the conditions in which they operate.

Status - Accepted - closed

SAFETY RECOMMENDATION 2003-123

The aircraft manufacturer, BAE Systems, should consider the introduction of a sampling programme for the elevator servo tab bearings and other flight control system bearings that are vulnerable to the effects of aircraft washing and de-icing, with a view to establishing a regular maintenance or replacement requirement for those bearings as necessary.

Response

Following a series of restrictions in icing conditions, one of BAE Systems operators conducted a bearing replacement programme in the flying control circuits on a number of their 146 aircraft. BAE Systems requested that the removed bearings be returned to Prestwick for examination. As a result of this exercise, a service bulletin, 146-27-177, is being raised. This will recommend that the exposed bearings in the aileron and elevator trim tab, servo tab, control rods, and surfaces are replaced at the 8 year structural check. This periodicity was supported by the fleet check results, and by a statistical analysis of the flying control restrictions across the Bae146/RJ fleet. The service bulletin has been formatted in parts to facilitate AD action on the most critical bearings.

Status - Accepted - open (Appropriate Action Implemented/Planned)

Boeing 747-300	London Heathrow Airport	07-Dec-2002	Accident
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AAIB Bulletin: 11/2004
FACTOR: F49/2004

Synopsis

The aircraft was taxiing for departure when the crew heard a bang, the aircraft nose pitched down significantly and moments later the 'STAB TRIM' caption on the master warning panel illuminated. The commander cancelled the departure and taxied the aircraft back to a stand without further incident. A subsequent engineering examination revealed that the nose landing gear outer cylinder had suffered a circumferential fracture and a large section of the cylinder material had been ejected onto the taxiway. A metallurgical examination concluded that the fracture had occurred as the result of fatigue initiating at the base of a groove at the upper edge of the internal diameter (ID) seal band. The fracture had propagated through approximately half of the cylinder wall thickness prior to the final failure. The groove, square shaped in cross section and of an appearance that it had been made by a rotating cutting wheel, was machined into 70% of the internal circumference. The outer cylinder had been overhauled once since original manufacture during which rework in the area of the ID Seal had been carried out.

SAFETY RECOMMENDATION 2004-069

It is recommended that the Federal Aviation Administration (FAA) should consider deleting or amending Federal Aviation Regulation (FAR) 145.219 paragraph 'c' to ensure that maintenance/overhaul records are retained for the life of the aircraft/component.

Response

The Flight Standards Service evaluated this safety recommendation and determined that an amendment or deletion of Title 14 Code of Federal Regulations (14CFR) section 145.219(C) is not warranted. Amending the rule to require repair stations to maintain records indefinitely would be an undue financial burden on the part 145 repair station. Currently it is the owner's/operator's responsibility to keep all maintenance/overhaul records for the aircraft. This is referenced in 14-CFR sections 91.419, 121.380 and 135.439. The FAA considered that rules, guidance, and programs already in place satisfy the concerns of the recommendation and plan no further action.

Status - Rejected - open

SAFETY RECOMMENDATION 2004-070

It is recommended that the Federal Aviation Administration (FAA) adopt a programme for performing targeted surveillance and increased oversight of overhaul practices at '14 Code of Federal Regulations Part 145' Repair Stations that are conducting repair, overhaul and rework of aircraft landing gears, to ensure that the manufacturer's overhaul manuals and instructions are followed and that appropriate quality assurance procedures are in place for the continued airworthiness of these components.

Response

The Flight Standards Service evaluated this safety recommendation and determined that the basic requirements already exist. FAA Order 1800.56E, National Flight Standards Work program Guidelines, identifies required surveillance activities (R items) and requires at least one complete facility inspection (PTRS Code 3650) per year on each certificate repair station. The Facility inspection is conducted in accordance with FAA Order 8300.10, Airworthiness Inspector's Handbook, volume 3, chapters 97 and 98, which includes a requirement to observe and inspect maintenance functions. More specifically, the inspector is to ensure that work for 14 CFR part 121 and 125 operators is being performed in accordance with the specific operator's manual, and the inspector is to ensure that the maintenance being performed is in accordance with approved procedures. The FAA considered that rules, guidance, and programs already in place satisfy the concerns of the recommendation and plan no further action.

Status - Rejected - open

Boeing 727-230F Freighter	East Midlands Airport	19-Nov-2002	Incident
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**AAIB Bulletin 12/2003
FACTOR F3/2004**

The crew reported a loud grinding sound immediately followed by illumination of the 'engine failure' light. They aborted the takeoff at approximately 30 kt and as the thrust levers were closed the commander was aware of resistance within the No 1 thrust lever system. Subsequent examination revealed significant fire damage centred around the underside of No 1 engine, evidence of penetration from inside the engine casing and a fracture of a second stage low pressure (LP) compressor fan blade at the root attachment. There was no evidence of cowl penetration.

Previous incidents, where JT8D second stage LP compressor blade root fractures have caused the release of a blade from the disk, resulted in a manufacturer's Alert Service Bulletin (ASB) No

5729 requiring an ultrasonic and fluorescent penetrant inspection of all second stage fan blade roots. The fan blades from this engine had been inspected in accordance with the ASB but this failure occurred before a re-inspection was required. A blade redesign is available through implementation of a further Service Bulletin (SB). There have been no reported failures to modified blades.

SAFETY RECOMMENDATION 2003-113

It is recommended that the FAA, in conjunction with Pratt & Whitney review the inspection and re-inspection period for the LP compressor second stage fan blades as detailed in ASB 5729 and mandated in AD 87-14-01.

SAFETY RECOMMENDATION 2003-114

It is recommended that the FAA, in conjunction with Pratt & Whitney, mandate SB 5866 that provides a more durable second stage fan blade root attachment and a higher life second stage disk.

Response

The Engine and Propeller Directorate agrees in principle with this recommendation. Although data suggests that accomplishment of Pratt & Whitney (P&W) JT8D SB 5866 would further reduce the failure rate, the calculated safety risk based on an already low failure rate does not support mandating SB 5866.

In the FAA’s previous response, it mentioned that it would work with P&W to revise the compliance category of SB 5866. During the reviews with P&W, the FAA stated that it became clear that revising the SB would not result in increased fleet incorporation, since any information listed within an SB is not mandatory unless enforced by an accompanying AD. However, the FAA has decided to revisit Safety Recommendation 03.243 to also address 03.244.

The FAA is reassessing the inspection intervals currently mandated within AD 87-14-01R1. P&W is assisting the FAA with a revised risk analysis, complete with updated assumptions, to determine the inspection intervals required to maintain fleet safety. In addition, the FAA is considering adding a more thorough inspection to better detect cracks. Despite the relatively low risk of failure, the 2003 event at East Midlands airport resulted in adding SB 5866 to this revised AD as optional terminating action for this inspection.

The Engine and Propeller Directorate believes adjusting the inspection requirements of AD 87-14-01R1 and including SB 5866 as terminating action will further reduce an already low failure rate and meet the intent of this safety recommendation.

The FAA will provide a follow-up response to this safety recommendation when the NPRM publishes.

Status - Accepted - open (Appropriate Action Implemented/Planned)

Boeing 737-436	Near Clacton, Essex	08-Nov-2002	Incident
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AAIB Bulletin: 6/2004
FACTOR: F35/2004

Synopsis

Whilst climbing through FL240 the flight crew noticed a small amount of smoke appear on the flight deck, accompanied by a smell of electrical burning. They decided to carry out a diversion but were hampered by difficulties in communications with the cabin crew and locating the appropriate checklist, since it was not clearly identified on the index page of the QRH. Fire damage had occurred to electrical wiring in the area of the ‘dropdown’ ceiling panel immediately aft of the flight deck door. A braided steel water supply hose to the forward galley had been

attached by means of a simple electrical 'tie-wrap' to a wiring loom, and there was evidence of abrasion and arcing between the wires and the hose. This had resulted in the severing and shorting of a number of wires. It was determined that the hose was too long for this application and that the excess length had been looped through this overhead area and then secured by the tie-wrap to adjacent wire bundles. It was not conclusively determined when this had been done but it was most likely that the attachment was simply a short-term expedient while systems were being disconnected and disassembled, and that the error was then missed during reassembly.

SAFETY RECOMMENDATION 2004-016

It is recommended that the Boeing Commercial Airplane Company review the B737 non-normal checklist for 'Smoke' to ensure that the procedure for smoke on the flight deck is unambiguous and clearly identified in order to give flight crews the best opportunity to locate it in conditions of low visibility.

Response

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-017

It is recommended that the Boeing Commercial Airplane Company review the illustration and text material of the Maintenance Manual relating to the installation of the forward galley installation in the B737-400, and any other affected model, to give clear instruction as to where the galley water supply hose disconnection should be made when removing the galley.

Response

Status - Response Awaited - open

Boeing 747-240B	Manchester International Airport	13-Jun-2002	Incident
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AAIB Bulletin: 3/2004
FACTOR: F35/2004

Synopsis

The aircraft was operating a scheduled service between New York Kennedy Airport and Manchester International Airport. An uneventful approach and touchdown were carried out on Runway 24R following which reverse thrust was selected on all engines to approximately three-quarters power. At around 80 kt reverse thrust was cancelled, engine Nos 1, 2 and 4 reversers stowed normally but flight deck indications showed No 3 reverser remained unlocked and in transit.

After the landing of the B747, a Boeing 757 aircraft was cleared to cross Runway 24R, from the F2 holding point on the north side to the south side. While crossing behind the B747 the first officer on the B757 noticed a large piece of engine cowling falling from the aircraft during its landing roll. He notified Air Traffic Control (ATC) who took action to prevent other aircraft landing on the runway. ATC also offered the support of the emergency services to the commander of the B747 which was declined. The B747 continued taxiing to its allocated parking stand where, following engine shutdown, the passengers were disembarked.

SAFETY RECOMMENDATION 2004-009

The Federal Aviation Administration and the European Aviation Safety Agency, in conjunction with the manufacturers of the thrust reverser system and the affected aircraft types, should consider requiring an inspection procedure, to be performed whenever reverser re-rigging becomes necessary, to ensure the soundness of the bonding and mechanical fastenings

attaching the clevis fittings to the transcowl of the thrust reversers of CF6-6 and CF6-50 engine installations.

Response

The Federal Aviation Administration (FAA) is responsible for the Type Certificate of the GE model CF6-6 and CF6-50 engines and the Type Certificate of Boeing products on which these engines are installed. EASA will coordinate with the FAA to evaluate the need for a modified inspection procedure.

Status - Response Awaited - open

DHC-8-311	30 nm north-east of Newcastle Airport	22-Apr-2002	Incident
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AAIB Bulletin: 5/2004
FACTOR: F26/2004

Synopsis

While in Class G (unregulated) airspace, LN-WFA was operating under a Radar Information Service (RIS) from Scottish Control. Following information from the controller of closing traffic, the pilot acquired the reported traffic on his Traffic Collision and Avoidance System (TCAS). He then received a Resolution Advisory (RA) alert/warning commanding a climb, with which he complied, and subsequently reported this manoeuvre event to Scottish Control.

The pilot reported the incident as an Airprox on 25 April 2002 to the UK authorities. Subsequent enquiries established that the Airprox had occurred with two Sea Harriers operating from a Royal Navy vessel in the North Sea, whilst on a practice interception. Interpretation of radar information indicated that the closest separation distance was between 3,450 and 3,700 feet.

SAFETY RECOMMENDATION 2002-055

The Civil Aviation Authority should re-examine the airspace categorisation, procedures and services currently available to Civil Air Transport aircraft which operate through unregulated airspace associated with regional airports in the north-east of the UK, with the aim of ensuring that a level of protection is afforded to such aircraft from military aircraft such that airprox events are avoided. The impact of any potential changes to the available unregulated airspace used by military aircraft should be minimised as far as possible.

Response

The airspace categorization, procedures and services available to Civil Air Transport (CAT) aircraft are continuously monitored and re-examined on a regular basis. However, the CAA does not consider that there are any airspace or Air Traffic Services Outside Controlled Airspace (ATSOCAS) service provision failings associated with the incident that occurred on 22 April 2002. Other incidents referred to in the bulletin are either still under investigation, or have been demonstrated to be due to either pilot or controller errors of judgement, rather than the airspace structure. Modifying the existing airspace structure to allow CAT unrestricted access to all parts of the UK FIR under the protection of Controlled Airspace (CAS), with the aim of removing the risk of airprox incidents between CAT and military aircraft, would unfairly penalise military and General Aviation activities, as well as being disproportionate to the level of existing and forecast CAT activity. Irrespective of the airspace classification awarded, the procedures used or the services provided, it is unrealistic to believe that airprox events can be avoided.

Revised airspace arrangements for the North Sea area, that included provision of CAS access to the National Airways System from Newcastle International Airport, were introduced in March 2003. Further augmentation of CAS connecting Newcastle and Aberdeen Airports together with an extension to the Scottish TMA are under discussion for possible adoption in Autumn 2004, the introduction of which would further enhance safety levels for CAT operating to and from

these regional airports. However, it is unrealistic to expect CAS to be established for every CAT need irrespective of the volume of traffic. The CAA has also issued a policy statement within which guidance regarding public transport flights outside CAS is provided to aircraft operators. Finally the CAA continues to be proactive in the monitoring of activity outside of CAS and has instituted a high-level steering group to oversee and co-ordinate all uncontrolled airspace and associated service provision matters. Under their guidance, a full review of the policy for ATSOCAS is already underway.

Status - Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2004-021

The concurrent use of unregulated airspace by both CAT and military aircraft in the north-east of the UK, should be reviewed jointly at the highest level by the CAA and MoD with the aim of eliminating Airproxes and potential collisions, with likely large scale loss of life, between Civil Air Transport and military aircraft.

Response

Successive studies of Airprox statistics between military and CAT in Class F and G airspace following earlier AAIB recommendations have demonstrated that the risk of collision has not increased. Meetings between the CAA and MoD will continue on a regular basis to analyse changing patterns of airspace usage by all participants and to propose appropriate changes when necessary. However, a joint CAA / MOD team is being proposed to review the current use of Class G airspace arrangements by military and commercial air transport aircraft.

The CAA and the MoD already conduct regular meetings at the highest levels to discuss the use of uncontrolled airspace, with particular emphasis on areas in the north-east of the UK. The major discussion point at every meeting is the maintenance or enhancement of safety standards. However, the diverse nature of operations within uncontrolled airspace means that the concept of eliminating all Airproxes, whilst a laudable aim, is unrealistic in practice. An expanding CAS structure serves Newcastle International Airport, but it is unrealistic to expect it to cater for every conceivable CAT desire. It is legitimate for commercial operators to elect to fly in uncontrolled airspace, but they must be aware that different operating procedures apply to those within CAS.

Status - Accepted - open (Appropriate Action Implemented/Planned)

Dornier 328-100	Edinburgh Airport	06 Mar 2002	Accident
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AAIB Bulletin: 3/2004
FACTOR: F18/2004

Synopsis

Prior to the planned flight the forward passenger door was closed and locked. The flight crew confirmed the correct positioning of the door during their pre-start checks. During the take-off run, at about 100 kt, the door opened and the flight crew aborted the take off. The door and locking mechanism were undamaged, however, the hinge arms of the integral air stairs were so severely damaged that it is unlikely that the door and the integral stairs would have remained attached had the aircraft continued to accelerate and become airborne. It is concluded that the most probable way in which the door opened was that the door-handle was inadvertently operated during the take-off run. The ergonomic features of the cabin crew station would have contributed to the handle being inadvertently grasped during this phase of flight.

SAFETY RECOMMENDATION 2003-109

It is recommended that the European Aviation Safety Agency review the design characteristics of the door operating, attachment and restraint mechanisms of the Dornier 328 aircraft type, in order to minimise the possibility of inadvertent door operation and to ensure that there is sufficient residual strength in the door/airstair attachments to prevent separation of the door in the event of a door coming open during takeoff or initial climb.

Response

EASA will evaluate the need to perform a certification design data review to evaluate if additional corrective action is needed to minimise the possibility of an inadvertent door opening during takeoff or initial climb.

Status - Partially Accepted - open

Boeing 737-8AS	London Stansted Airport	27-Feb-2002	Incident
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AAIB Bulletin: 7/2004
FACTOR: F37/2004

Synopsis

The aircraft was inbound to London Stansted from Dublin on the last of four consecutive sectors of duty for the whole crew. The first officer was undergoing line training during this sector and had been designated as Handling Pilot. The aircraft was established on final approach to Runway 23, when, shortly after lowering the landing gear, the flight and cabin crew became aware of an increased level of vibration in the aircraft. The flight deck instruments indicated that this was due to increased vibration in the No 2 engine. Although this indication was within the prescribed limit, the commander instructed the first officer, to use only idle reverse after landing.

The touchdown was normal but, shortly after touchdown, the cabin crew became aware of a smell of burning. During the landing roll, the commander took control of the aircraft, in accordance with standard operating procedures. The aircraft vacated the runway at the second 'high speed' exit.

As it passed an airfield operations vehicle, the airfield operations officer in the vehicle saw flames emitting from the rear of the aircraft's right engine. This was not visible from the Tower Visual Control Room. She advised ATC on the Tower radio frequency. Just before this conversation between the tower and the officer, the aircraft had been transferred to the Ground Movements Controller (GMC). The commander instructed the first officer to shut down the right engine. The GMC initiated an Aircraft Ground. By this stage the aircraft had been brought to a halt on the taxiway at Block 141, across Taxiway 'H' and heading 140°. This placed the aircraft crosswind with the right engine on the upwind side. Some of the cabin crew at the rear of the cabin were now aware of smoke outside the aircraft on the right hand side. The commander briefed the Senior Cabin Crew Member (SCCM), informing him that ATC had reported smoke coming from the right engine and that the Fire Service were on their way to investigate. The commander also briefed that, at that stage, there was no indication on the flight deck that an evacuation would be necessary. The SCCM returned to the cabin and briefed the other cabin crew members on the situation, telling them not to leave their doors. The commander briefed 'Fire One' that the aircraft had experienced vibration on the right engine, that there were no indications of a fire, but smoke had been noticed by ATC.

With the No 2 engine shut down, the commander requested the RFFS to investigate the state of the engine. When informed that aircraft had smoke billowing from number two engine, the commander briefed the SCCM on the impending evacuation, confirming that slides would be used and that the evacuation would be initiated on his command. As part of the evacuation procedure, the fire bottles were discharged into each engine. The commander ordered the passengers and crew to evacuate the aircraft, leaving the decision as to which exits were to be

used to the cabin crew, in accordance with standard operating procedures. At that time the fire crew called the aircraft saying "can you make sure you evacuate port side", which was not acknowledged. The cabin crew opened the Type I exits at the front and rear of the cabin. Passengers opened the overwing exits. Four positioning cabin crew assisted the operating cabin crew during the evacuation. About 40 passengers evacuated onto the right side of the aircraft, including six onto the right wing. This placed them in the vicinity of the right engine and the area where the fire crews were directing their firefighting efforts. These six passengers were instructed by the fire crew to return inside the aircraft and seek an alternative exit. The passengers who evacuated on the left side used the doors. The passengers were escorted away from the aircraft into two groups, depending on which side they had evacuated. Those who had exited to the left side congregated to the east, downwind of the aircraft. This placed them in an area where smoke drifted downwind from the right engine. Those who had exited to the right side assembled to the south of the aircraft on the grass adjacent to Block 51. Coaches were dispatched from the Terminal to pick up the passengers. All passengers and crew were accounted for.

SAFETY RECOMMENDATION 2004-050

It is recommended that the Civil Aviation Authority review the instructions to Air Traffic Controllers, when they are advising an aircraft on the ground of signs of fire, to include the surface wind in their notification transmission.

Response

A review of the instructions and advice to Air Traffic Controllers, when dealing with aircraft emergencies, with a view to including the surface wind when advising an aircraft on the ground of signs of fire, will be initiated without delay. This review is expected to be complete by mid-October and any necessary revisions or additions will be promulgated by means of an Air Traffic Services Information Notice (ATSIN) pending incorporation in the Manual of Air Traffic Services Part 1.

CAA Action

ATSIN Number 55, 'Recommended action to be taken in the event that an aircraft on the ground is on fire or where there are signs of fire', was issued on 19 October 2004. The ATSIN draws the title Recommendation, and its acceptance by the CAA, to the attention of Air Traffic Control providers and, in addition, to Flight Information Service providers and operators of Air/Ground Communication Services at aerodromes. A requirement to pass the surface wind to an aircraft on the ground, when it reports that it may be on fire or when it is advised of signs of fire, was incorporated in the Manual of Air traffic Services Part 1 with the issue of Amendment 63 which became effective on 29 October 2004.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-051

It is recommended that the Civil Aviation Authority review the instructions to Fire Officers, when attending an aircraft fire, to ensure that they consider advising the flight crew on the best route for evacuation, as well as advising on the need to evacuate.

Response

A review of the instructions to Fire Officers, when attending an aircraft fire, has been conducted and appropriate instructions, to ensure that they consider advising the flight crew on the best route for evacuation, as well as advising on the need to evacuate, have been issued. In addition, Fire Training Schools have been notified of this Safety Recommendation, so that the revised instructions can be incorporated within their training courses.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-052

It is recommended that the Civil Aviation Authority encourages aerodrome operators to provide suitable video recording facilities at airports operating public transport flights in order to preserve best evidence in the event of an accident or incident.

Response

The CAA has carried out an initial consultation and many aerodromes already undertake video recording of selected airside activities. Through its routine publications and other appropriate means, the CAA will encourage aerodrome operators to provide or utilise existing video recording facilities to monitor as much of the movement area as possible, in order to preserve best evidence in the event of an accident or incident.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-053

It is recommended that the Irish Aviation Authority and JAA review the requirements for cabin crew initial and refresher training in respect of the operation of all normal and emergency exits, to ensure that crew members become, and remain, familiar with the different operating procedures, and opening characteristics, in both normal and emergency modes of operation.

Response

The JAA Operations Sectorial Team took the decision to progress the content of the Safety Recommendation by mandating the Cabin Crew Study Group (CCSG) to conjugate it with their present work on reviewing JAR OPS 1 requirements for cabin crew exit training. The intention is to progress the matter further, via the normal Notice of Proposed Amendment (NPA) action.

Pending the proposals made by the CCSG, the entire process is likely to have an impact on the following operational requirements: Appendix 1 to JAR-OPS 1.1005-Initial Training; Appendix 1 to JAR-OPS 1.1020-Refresher Training. Any resultant proposals will be subject to the standard NPA-OPS process, which will include a three months public comment period, before being submitted to the JAA Committee (JAAC) for adoption.

Status - Accepted - open (Appropriate Action Implemented/Planned)

EMB145	En Route - Divert to EMA	15-Feb-2002	Incident
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AAIB Bulletin 5/2002
FACTOR: F9/2002

Synopsis

On the 15 February 2002 an Embraer 145, registration G-RJXC, en route from Leeds to Paris developed hydraulic problems and diverted into East Midlands Airport. When full flap was deployed the left outboard spoiler opened and resulted in the handling pilot requiring to use almost full roll trim and in excess of 75% of the available control wheel to maintain wings level attitude.

When the DFDR was replayed it was noted that data sampled at greater than one sample per second appeared not to have been updated at the appropriate time, in that a series of identical values were recorded. An alternative reason for the repeated samples was that the recorded resolution was inadequately low and variable in extent. It is possible that data sampled less frequently are similarly affected, but anomalies in the recording of data sampled at 1 sample per second are difficult to identify by inspection.

The AAIB has been involved in four other incidents to Embraer 145 aircraft of both British Midland and British Regional, and has data from two other routine downloads. All of these recorders exhibited similar faults. The inference must therefore be that the same problem exists on all Embraer 145 aircraft. The anomalies were discovered by detailed inspection of the data, it is unlikely that the problems would be picked up by the current routine replay system.

SAFETY RECOMMENDATION 2002-004

The CAA should ensure that other aircraft types operating on the UK register and fitted with similar flight data recording installations meet UK regulatory requirements.

Response

The CAA will take measures to ensure that other aeroplane types operating on the UK register and fitted with similar flight data recording installations meet the UK regulatory requirements. The measures taken will take into account the results of the investigation performed under Recommendation 2002-01.

CAA Action

Embraer and Honeywell have identified and rectified the incorrect parameters in the Digital Flight Data Recorder (DFDR) used on their aircraft types. The results of their investigations now show that the issue is specific to the Embraer Data Acquisition Units (DAU) within the DFDR only. The Brazilian CTA has issued an AD (item C145-31-041 Embraer SB 145-31-041), which addresses the EMB 145 incorrect parameter (sampling rate) issue. The DAUs used on other aircraft types are not affected. As a consequence no further action is proposed.

Status - Accepted - closed

Challenger CL600	Birmingham Airport	04-Jan-2002	Accident
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AAIB AAR: 5/2004
FACTOR: F39/2004

Synopsis

Immediately after takeoff from Runway 15 at Birmingham International Airport the aircraft began a rapid left roll, which continued despite the prompt application of full opposite aileron and rudder. The left winglet contacted the runway shoulder, the outboard part of the left wing detached and the aircraft struck the ground inverted, structurally separating the forward fuselage. Fuel released from ruptured tanks ignited and the wreckage slid to a halt on fire; the Airport Fire Service was in attendance less than 1 minute later. The accident was not survivable.

Numerous possible causes for the uncontrolled roll were identified but all except one were eliminated. It was concluded that the roll had resulted from the left wing stalling at an abnormally low angle of attack due to flow disturbance resulting from frost contamination of the wing. A relatively small degree of wing surface roughness had a major adverse effect on the wing stall characteristics and the stall protection system was ineffective in this situation. Possible asymmetric de-icing by the Auxiliary Power Unit (APU) exhaust gas during pre-flight preparations may have worsened the wing-drop tendency.

N90AG's pilots should have been aware of wing frost during pre-flight preparations but the aircraft was not de-iced and the ice detector system would not have alerted them. It was considered that the judgement and concentration of both pilots may have been impaired by the combined effects of a non-prescription drug, jet-lag and fatigue.

Possible contributory factors were: the inadequate warnings on the drug packaging, Federal Aviation Administration (FAA) guidance material suggesting that polished wing frost was acceptable and melting of the frost on the right wing by the APU exhaust gas.

The investigation identified the following causal factors:

1. The crew did not ensure that N90AG's wings were clear of frost prior to takeoff.
2. Reduction of the wing stall angle of attack, due to the surface roughness associated with frost contamination, to below that at which the stall protection system was effective.
3. Possible impairment of crew performance by the combined effects of a non-prescription drug, jet-lag and fatigue.

SAFETY RECOMMENDATION 2003-056

It is recommended that the Civil Aviation Authority require the following specific statement within the limitations section of the flight manuals of aircraft with a significant susceptibility to ice contamination, 'Wings and tail surfaces must be completely clear of snow, ice and frost prior to takeoff', and communicate this recommendation to other civil airworthiness authorities responsible for the primary type certification of new aircraft types.

Response

Since 28 September 2003, responsibility for the matters addressed in this Recommendation has passed to EASA under Regulation (EC) 1592/2002 and the recommendation should be addressed to that Agency.

CAA has, therefore, forwarded this recommendation to EASA.

CAA Status - closed

EASA Status - Response Awaited - open

Shorts SD3-60, Tornado F3	26.5nm north of Newcastle Airport	20-Mar-2000	Incident
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AAIB Bulletin: 2/2001
FACTOR: F20/2001

Synopsis

A Shorts SD3-60 aircraft, G-OLAH, was operating a scheduled service from Aberdeen to Newcastle. The direct track between the two aerodrome control zones followed by the aircraft lay within Class G airspace. At the same time a formation of three RAF Tornado F3 aircraft were engaged in a Tactical Leadership Training medium scale night exercise planned by the Air Warfare Centre and notified to civilian operators by NOTAM. As the SD3-60 descended to FL50 into Newcastle, under a Radar Advisory Service (RAS), one of the Tornados was manoeuvring at high speed and passed closely in front of the SD3-60 at the same level. The Newcastle radar controller, who observed the military traffic on his radar, provided the SD3-60 pilot with avoiding headings, which were followed. Despite this, and because the Tornado was manoeuvring, both aircraft conflicted, with the closest point of approach estimated to be some 300ft horizontally and 100ft vertically. The Tornado navigator detected the confliction on his radar moments before and warned his pilot of the danger. Neither he nor the pilot saw the aircraft until it had passed behind them and too late to take any avoiding action. The pilot of the SD3-60 did not see the Tornado until it passed in front of his aircraft.

SAFETY RECOMMENDATION 2000-057

The CAA, in conjunction with the Director of Airspace Policy, should, by means of risk assessment, quantify the risk of mid-air collisions occurring between scheduled public transport

services, which operate wholly or partially outside controlled airspace, and other users of Class F and G airspace.

Response

It is not possible to gather the statistical data required to conduct the quantitative risk assessment called for by this Recommendation. Therefore, the Directorate of Airspace Policy conducted an immediate safety assessment of operations by scheduled public transport services in Class F and G airspace throughout the UK. The study confirmed that there had been a concentration of incidents in the vicinity of Newcastle Airport and that provided a Radar Advisory Service or Radar Information Service is used, the target levels of safety are met. However, this and a number of other incidents indicate that not all military traffic is availing itself of such air traffic services. Consequently, the CAA is continuing to work closely, as a matter of urgency, with the MOD and Newcastle Airport, on a wide range of initiatives aimed at reducing conflicts of this nature in the future. This work is expected to be complete by October 2001, after which the subject will continue to be reviewed as part of the ongoing safety assurance process.

Action

A variety of initiatives aimed at reducing conflicts between scheduled public transport services and military aircraft have been introduced between May 2001 and October 2001. Use of a serviceable transponder is now mandatory for military flights within the UKLFS, and military pilots engaged in low-flying activities have been directed to make an information call to Newcastle Airport when operating close to the Newcastle CTR boundary and when transiting the Hexham Gap. During large-scale military exercises in the area, an airspace buffer is put in place around the Newcastle CTR for UKLFS participants. A Military Liaison Officer is deployed to Newcastle Airport ATC during such exercise periods. The Liaison Officer has full details of exercise activities and acts as a point of contact for any unusual occurrences or incidents. The situation in the Newcastle area remains under constant review, with Newcastle Airport providing CAA and MOD with monthly reports on any issues of concern, MOD subsequently investigates any suspected breaches of airspace, military regulations or UKLFS procedures arising from these reports and takes appropriate remedial action. The MOD and Newcastle Airport, in conjunction with the CAA, continue to meet at six monthly intervals to promote the safe and efficient use of airspace in the region.

Status - Partially Accepted - closed

SAFETY RECOMMENDATION 2000-058

The CAA, in conjunction with the Director of Airspace Policy, should assess whether there is adequate provision of regulated airspace for scheduled air transport operations to and from regional airports that are not directly linked by airways or advisory routes.

Response

The safety assessment referred to in the response to Recommendation 2000-57 indicates that target levels of safety are met where Radar Advisory and Radar Information Services are utilised. However, a further consideration of the adequacy of the airspace in the Newcastle area will be conducted following discussions with MOD. It is expected that this further work will be concluded by April 2002.

CAA Action

Following consultation with MOD, a joint CAA/MOD review team, the North East Airspace Team (NEAT), was formed specifically to review the risk of collisions between CAT aircraft and military fast jets flying in unregulated airspace in the North-East of the UK.

The Recommendations of the NEAT Review have yet to be published, but have been endorsed by both the CAA and MOD and will be notified separately. However, of the 48 Airprox incidents between CAT and military aircraft analysed by the NEAT review, only one was considered Category A (actual risk of collision). The risk of collision between CAT and military fast jet aircraft operating outside controlled airspace remains within ICAO target levels of safety.

Nevertheless, additional regulated airspace was introduced in February 2004 to connect Newcastle Airport with Aberdeen and the Scottish TMA and further changes to the Newcastle CTA/CTR are planned for early 2006, all of which further enhance the safe operation of CAT.

The CAA will continue to monitor the situation in the light of these developments to ensure that, as far as possible, there is sufficient controlled airspace to meet the needs of CAT having regard for the needs of other airspace users.

Status - Partially Accepted - open

Section 2

Aeroplanes above 2,250kg and below 5,700kg MTWA

L39 Albatros L39ZO	Near Duxford Airfield, Cambridgeshire	02-Aug-2003	Accident
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AAIB Bulletin: 2/2005
FACTOR: F6/2005

Synopsis

During a 'run and break' rejoin to the circuit at Duxford, the pilot turned crosswind, reduced the throttle to IDLE and extended the speed brakes. After lowering the landing gear he increased the throttle but then noticed "a change in the usual sound" of the engine. As the aircraft was descending below circuit height he added full power but the engine did not spool up. After making a MAYDAY call he considered that the aircraft was too low to attempt an engine restart and that he was also outside the safe ejection envelope. The pilot therefore decided to carry out a forced landing into a field. The landing was successful but the nose landing gear collapsed during the ground roll. An examination of the engine revealed that the inlet directing body of the high pressure compressor had seized. This could have caused a sub-idle engine surge when the throttle was rapidly retarded to IDLE. A service bulletin calling for a torque check of the inlet directing body had not been carried out. In addition, there was no record of the engine having been overhauled since its manufacture in 1982.

SAFETY RECOMMENDATION 2004-091

It is recommended that the UK Civil Aviation Authority considers mandating a calendar time limitation between overhauls for Ivchenko AI-25TL engines.

Response

The CAA accepts this recommendation to consider the imposition of a calendar time limitation between overhauls for Ivchenko AI-25TL engines. The CAA will assess related data and consult with known owners and operators to determine whether there is a need to define an appropriate calendar time limit, or an acceptable alternative maintenance programme. These actions will be complete by September 2005.

Status - Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2004-092

It is recommended that the UK Civil Aviation Authority takes appropriate action to inform owners, operators and maintainers of L-39 type aircraft of the need to check that the Inlet Directing Body (of the high pressure compressor) operates correctly in accordance with Service Bulletin Ivchenko Progress 225000521.

Response

The CAA accepts this recommendation. The CAA sent a letter, on the 3rd February 2005, drawing the attention of owners, operators and maintainers of L-39 type aircraft to the need to ensure correct operation of the Inlet Directing Body (of the high pressure compressor) in accordance with Service Bulletin (SB) Ivchenko Progress 225000521. The letter also contained a reminder that the conditions for L-39 Permit Maintenance Release require that aircraft and equipment (which includes engines) be maintained to manufacturers' instructions.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-093

It is recommended that the UK Civil Aviation Authority emphasises to operators of Permit to Fly aircraft that it is their responsibility to ensure that they possess all published service information and that they regularly check for new service information published by the manufacturer.

Response

It should be noted that published manufacturer's service information is not available for all aircraft issued with a Permit to Fly. However, the CAA will publish a Letter to Owners/Operators (LTO) of aircraft issued with a Permit to Fly administered by CAA, and to organisations who are approved in accordance with BCAR Chapter A8-20 that maintain ex-military aircraft, reminding them of their responsibilities to have access to current published service information when undertaking maintenance on an aircraft. In addition the CAA will forward a copy of this LTO to the Popular Flying Association and to the British Microlight Aircraft Association with a request that they bring it to the attention of their members. It is planned to publish this LTO before 31 March 2005.

CAA Action

The CAA has published Letter to Owners/Operators (LTO) No 2775 on 10 March 2005 to remind operators of Permit to Fly aircraft of the need to obtain the latest service information for their aircraft and that it is taken into account during maintenance. A copy of Letter to Owners/Operators No 2775 was sent to the Popular Flying Association and the British Microlight Aircraft Association on 14 March 2005 requesting them to advise their members of the content of this LTO.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-094

It is recommended that UK Civil Aviation Authority emphasises to operators of Permit to Fly aircraft that in situations where service information is only available in a foreign language, it is the operator's responsibility to obtain, if necessary, a translation of the service information into a language that the operator understands.

Response

Supplement 2 to BCAR Chapter A8-20 paragraph 2.5.1 d) already requires organisations involved in the maintenance of a foreign manufactured ex-military Permit to Fly aircraft to obtain copies of service information and any supporting documentation in the English language.

The CAA will at the next revision to BCAR Section A amend Chapter A3-7 to make similar provisions applicable to other aircraft of foreign origin issued with a Permit to Fly. The next revision of BCAR Section A is planned for June 2005.

In response to Recommendation 2004-93 the CAA is to publish a Letter to Operators (LTO) concerning the availability of service information. The need for service information to be available in the English language will be emphasised in this LTO. It is planned to publish this LTO before 31 March 2005.

CAA Action

The CAA published Letter to Owners/Operators (LTO) No 2775 on 10 March 2005 to remind operators of Permit to Fly aircraft of the need to obtain the latest service information for their aircraft in the English language. In addition the CAA is to revise British Civil Airworthiness Requirements Chapter A3-7 to require published service information to be available in the English language for all aircraft issued with a Permit to Fly. This revision is planned for the first quarter 2006.

Status - Accepted - open (Appropriate Action Implemented/Planned)

Aero L39C Albatros

Duxford Airfield

02-Jun-2002

Accident

AAIB Bulletin 7/2003
FACTOR F21/2003**Synopsis**

The planned flight was part of a conversion course onto the L-39 aircraft. The flight included navigation and general handling exercises and was to culminate in a landing at Duxford in order to refuel. The aircraft departed from its base at North Weald with the student occupying the front seat and the instructor in the rear seat. This is the conventional seating arrangement for an instructional flight in this tandem seat aircraft. The flight proceeded uneventfully and the aircraft joined the visual circuit at Duxford where Runway 06 was in use. The reported surface wind was 140°/10 kt, the visibility was greater than 10 km, there was no significant cloud or weather and the runway surface was dry.

When the aircraft arrived at Duxford the fuel quantity was 350 kg. The student pilot flew a slightly extended downwind leg, as requested by ATC, to allow time for a light aircraft to clear from the adjacent grass runway. The instructor considered that the subsequent approach profile was satisfactory although he noted that the airspeed during the final stages of the approach was reducing through 218 km/hr (118 kt) as opposed to the briefed speed of 200 km/hr (108 kt). During the landing flare the airspeed was 210 km/hr (113 kt) and still reducing. The instructor described the touchdown as "soft" (meaning a gentle touchdown) and noted that there was a slight drift to the left in the light crosswind. He estimated that the aircraft touched down about 150 to 200 metres along the runway and various eye-witnesses confirmed this estimate. This is the normal touchdown point for this type of aircraft. After landing the instructor was not aware of any retardation so he told the student pilot to "load the nose wheel and start braking". (Braking is inhibited until a micro switch on the nose wheel oleo operates). This instruction appeared to have been followed in that the control column moved further forward, but there was still no retardation. After further instructions to the student pilot to brake the instructor took control and applied the brake lever on his control column a number of times but to no avail.

When the aircraft was approaching the far end of the runway, with its attendant raised earth embankment, the instructor decided to steer the aircraft to the right towards open, level fields. However, he was able only to turn the aircraft through about 20° to 30° before the rudder became ineffective. ATC saw the aircraft deviate from the runway and asked the pilots if they had a problem; the student pilot replied "BRAKE FAILURE". The aircraft was, by then, running across a field of light crops towards the M11. The instructor asked the student in the front seat to operate the undercarriage retraction lever. He was unable to use the corresponding lever in the rear cockpit because the mechanism had been wire locked to prevent operation of the landing gear from that position. The instructor pilot did not use the emergency brake lever nor did he instruct the student pilot to do so. Moreover, the instructor did not shut down the engine nor did he instruct the student pilot to do so.

As the aircraft reached the airfield boundary, at a speed of about 20 kt, it passed to the south of the raised earth embankment and through the wooden boundary fence. It descended onto the motorway approximately 15 feet below, slid across the northbound carriageway, struck the central crash barrier and came to rest on the southbound carriageway. The instructor pilot, who had remained in his seat, was uninjured and the engine was still running.

At about the time that the aircraft went through the wooden fence and ran down the motorway embankment, the front ejection seat fired. The instructor had not ordered the student pilot to eject nor had he warned him not to do so (since by that time the aircraft's speed was well below the minimum for safe ejection on the ground). During the ejection sequence the student pilot separated from his seat but his parachute did not have sufficient time to deploy fully before he struck the ground.

The safety pins for the ejection seat and canopy jettison mechanisms were not carried on board the aircraft. Suitable safety pins were offered and fitted by a technician based at Duxford before the aircraft was removed from the motorway.

SAFETY RECOMMENDATION 2003-068

The Civil Aviation Authority should require operators of civil registered aircraft fitted with live ejection seats to carry the aircraft's escape systems safety pins: a. On all flights and high speed taxi tests. b. In a position where they are likely to be found and identified without assistance from the aircraft's flight or ground crews.

Response

The CAA accepts this Recommendation. Operational requirements applicable to ex-military aircraft are set out in Civil Aviation Publication (CAP) 632 (Operation of 'Permit-to-Fly' Ex-Military Aircraft on the UK Register). The CAA has notified current operators of civil registered, ex-military aircraft, fitted with live ejection seats, that they are required to carry the aircraft's escape systems safety pins:

- a. On all flights and high speed taxi tests.
- b. In a position where they are likely to be found and identified without assistance from the aircraft's flight or ground crews.

This requirement will be included in a newsletter and also the next addendum to CAP 632, both to be published in December 2003.

CAA Action

The amendment to CAP 632 has been delayed and is now planned for publication in May 2005. This will include the requirement for all operators of civil registered aircraft fitted with live ejection seats to carry the aircraft's escape systems safety pins: a. On all flights and high speed taxi tests; b. In a position where they are likely to be found and identified without assistance from the aircraft's flight or ground crews.

Status - Accepted - open (Appropriate Action Implemented/Planned)

Cessna C404 Titan	Near Glasgow Airport	03-Sep-1999	Accident
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AAIB AAR: 2/2001
FACTOR: F35/2001

Synopsis

The aircraft had been chartered to transport an airline crew of nine persons from Glasgow to Aberdeen. The aircraft was crewed by two pilots and its weight was close to the maximum permitted for take-off. ATC clearance for an IFR departure was obtained before the aircraft taxied from the business aviation apron for take-off from Runway 23, which has a take-off run available of 2,658 metres. According to survivors, the take-off proceeded normally until shortly after the aircraft became airborne when they heard a thud or bang. The aircraft was seen by external witnesses at low height in a wings level attitude that later developed into a right bank and a gentle descent. Witnesses reported hearing engine spluttering and saw at least one propeller rotating slowly. There was a brief 'emergency' radio transmission from the commander and the aircraft was seen in a steep right turn. It then entered a dive. A witness saw the wings being levelled just before the aircraft struck the ground on a northerly track and caught fire. Three survivors were helped from the wreckage by a nearby worker before flames engulfed the cabin.

The increased statistical risk in operating FAR/JAR Part 23 aircraft, in comparison with the larger FAR/JAR Part 25 "Transport Airplanes", is a strong incentive to incorporate at least some of upgraded seat requirements into the existing light aircraft fleet, particularly for those types in continuing production. For example, dynamic testing has shown the advantages of the fitting of upper torso restraints. Similarly, it is possible for seat attachment fittings to be strengthened without imposing a requirement that the FAR/JAR 23.562 injury criteria be demonstrated.

SAFETY RECOMMENDATION 2001-040

It is therefore recommended the CAA should undertake a study to identify those elements of the current JAR 23 seat standards which may be used for retrofit into existing aeroplanes whose maximum certified take-off mass is less than 5,700kg and, separately, for those designs in continuing production which are not covered by the current JAR 23 standards. These elements should then be applied at least to those that are operated in the Transport Category (Passenger).

Response

The CAA accepts this Recommendation. In the context of the factual information contained in Section 1 of the report, the CAA will undertake a study to identify any relevant parts of current JAR-23 seat standards that could effectively be applied retrospectively to aircraft. The study will separately focus on "in-service" aircraft and those "in continuing production" at weights under 5700kg operated in the Transport Category.

On completion of the study, by March 2002, consideration will be given to proposing amendments to the JAA operational requirements.

CAA Action

From a study to identify those relevant parts of JAR-23 seat standards that could effectively be applied retrospectively to aircraft, the CAA was satisfied that only the feasibility of retrospective application of upper torso restraint was worth pursuing. An investigation was then undertaken to examine this issue, which was completed in July 2003. A summary was then sent to Central JAA who responded by requesting CAA to draft an NPA for proposed rulemaking for inclusion in JAR 26. CAA agreed to submit the NPA by the end of June 2004. The NPA was drafted and reviewed internally within CAA in June 2004. It was however, also deemed necessary to provide a Regulatory Impact Assessment (RIA) to support the NPA. This was completed and sent with the NPA to the JAA in October 2004 who conduct the associated rulemaking activity in Europe.

Status - Accepted - closed

Section 3

Aeroplanes 2,250kg MTWA and below

DH 82A Tiger Moth	Duxford Aerodrome, Cambridgeshire	29-Jul-2004	Accident
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AAIB Bulletin: 3/2005
FACTOR: F11/2005

Synopsis

During a baulked landing on a temporary grass runway, the right main landing gear of the aircraft struck a proprietary 'Tribox' marker, being used to mark the runway's left edge. This caused the aircraft to decelerate, caused damage to the landing gear and gave the pilot cause to abandon his attempt to go-around. The investigation identified that the marker did not satisfy Civil Aviation Authority (CAA) requirements in terms of size, weight, or frangibility.

SAFETY RECOMMENDATION 2004-106

It is recommended that the United Kingdom Civil Aviation Authority Aerodrome Standards Department publish advice to aerodrome operators to ensure that obstacles placed within a runway's Cleared and Graded area are genuinely lightweight and frangible taking into account the types of aircraft that commonly use the runway.

Response

The CAA accepts the Recommendation and will issue informal guidance to industry regarding the frangibility of obstacles placed in the runway cleared and graded area by the end of March. Additionally, those aerodromes that use such markings will be contacted, to ensure that they are aware of the issue and the next amendment to CAP 168 will include guidance material regarding such markings and their frangibility - target date October 2005.

CAA Action

Informal guidance was issued to industry regarding the frangibility of obstacles placed in the runway cleared and graded area through Aerodrome Standards Department's "Reference Point" information leaflet on 30 April 2005. Additionally, their Aerodrome Inspector will contact those aerodromes that use such markings during the audit process, to ensure that they are aware of the issue, and the next amendment to CAP 168 will include guidance material regarding such markings and their frangibility – target date October 2005.

Status - Accepted - closed

Cozy	1 mile south of Junction 12, M5 motorway, Glos	10-Jul-2004	Accident
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AAIB Bulletin: 3/2005
FACTOR: F10/2005

Synopsis

At the conclusion of the previous flight, the aircraft landed at Kemble with the nose landing gear retracted (inadvertently). Damage to the underside of the nose was considered minor and the aircraft departed for Shobdon Airfield. During this flight, the inspection hatch for the retractable nose wheel system separated from the upper surface of the nose and passed through the

propeller at the rear of the fuselage. The resulting damage to the propeller caused severe vibrations, which necessitated the gradual reduction of engine power. The enforced power reduction culminated in a loss of height from 1,200 feet over a period of about three minutes and a forced landing. Before the landing the pilot turned off all the aircraft's systems.

The aircraft landed at a microlight field near Morton Valence which is located approximately one mile south of Junction 12 of the M5 motorway. The surface wind was from 300° at 15 kt and, being unable to discern a runway, the pilot elected to land to the south of the field, in a direction aligned with its length.

After touchdown, the aircraft's nosewheel sank into soft ground and the nose landing gear collapsed. The aircraft yawed and then pitched onto its back, causing substantial damage to the airframe including destruction of the right wing and canard, and the left wingtip-mounted fin. The aircraft was quickly righted by several people who were at the scene and the pilot then exited normally from the relatively undamaged cockpit, once the canopy, which opens upwards on a forward hinge, was free to open.

SAFETY RECOMMENDATION 2004-107

The European Aviation Safety Agency (EASA) should review the requirements for the design of exits and the provision of safety equipment within the Certification Specifications for Very Light Aeroplanes (CS-VLA), to enable rapid escape from such aircraft in any normal or crash attitude including turnover.

Response

The Agency's Rulemaking plan for 2006-2008 includes task number VLA.004. The Agency will establish a group by end 2005 to produce a Notice of Proposed Amendment (NPA) by end 2006 with an aim to amend CS-VLA by end 2007.

Status - Accepted - open (Appropriate Action Implemented/Planned)

Grob G115E	4.5 nm south-west of Salisbury, Wiltshire	29-Jun-2004	Accident
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AAIB Bulletin: 4/2005
FACTOR: F17/2005

Synopsis

The aircraft was completing an aerobatic manoeuvre when one of the propeller blades separated from the hub. Despite severe vibration, the pilot was able to shut down the engine quickly and perform a successful forced landing in a field. There were no injuries to either crew member.

The investigation determined that the No. 1 propeller blade had detached due to a high-cycle fatigue failure of the blade socket in the aluminium alloy hub. The pattern of cracking suggested that the failure may have been vibration related. It was also established that the propeller blade-retaining nut preload decreases rapidly in the first few hours of propeller operation, raising concerns that the reduction in blade retention stiffness could increase the blade's propensity to vibrate, thereby increasing the stresses in the hub.

SAFETY RECOMMENDATION 2004-102

The aircraft manufacturer, GROB-WERKE Aerospace Division, should perform testing of the HO-V343K-V/183GY propeller on the engine/airframe combination of the Grob G115E in order to establish the vibration characteristics of the propeller and the resultant stresses in the propeller blades and hub. This testing should also examine the effects of loss in preload of the blade retaining nut.

Response

Grob wrote to the Luftfahrt-Bundesamt, on 31 January 2005, in response to the AAIB recommendation agreeing to perform testing of the HO-V343K-V/183GY propeller on a Grob G115EG airframe (the 115EG differing from the 115E only in cockpit instrumentation).

Tests to examine the effect of the loss in preload of the blade retaining nuts would be limited to ground tests. Subject to the outcome of the ground tests, flight test manoeuvres would be carried out in accordance with the limitations of the G115E Flight Manual and evaluation of the results was expected in March 2005.

Status - Accepted - closed

Avid Speedwing (Modified)	Caernarfon Airport	28-Mar-2004	Accident
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AAIB Bulletin: 10/2004
FACTOR: F48/2004

Synopsis

Whilst taxiing, following an uneventful landing, the nose landing gear collapsed. Subsequent investigation revealed that circumferential cracking had developed from a through bolt hole used to retain a stop bushing (or lower bearing sleeve) on the nose gear strut. These holes had been drilled aligned with the fore and aft axis of the aircraft and were in the area of highest stress whenever the gear flexed, for example, during touchdown. It was recommended by the manufacturer and the PFA that the axis of this hole should be aligned perpendicular to the line of flight, in the axis of minimum stress loading, which is left to right and parallel to the nose wheel axle.

SAFETY RECOMMENDATION 2004-071

It is recommended that the PFA ensure all Avid Speedwing aircraft under construction or in service in the UK, that are fitted with a nose landing gear, have the nose gear strut installed with the axis of the bolt hole for the stop bushing aligned parallel to the nose wheel axle, and that none have been modified to leave redundant holes aligned with the aircraft longitudinal axis.

Response

The PFA published 'PFA Notes to Aircraft Inspectors (SPARS)' in October 2004 and will issue a PFA modification.

Status - Response Awaited - open

Piper PA-25-235	Crowland Airfield, Lincolnshire	01-Feb-2004	Accident
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AAIB Publications: 3/2005
FACTOR: F14/2005

Synopsis

The Pawnee carried out a normal takeoff towing a glider. At approximately 500 feet it inexplicably turned to the right and entered a descent. The glider released from the tow and was able to land normally back on the airfield. The aircraft however, continued its descent

striking the ground banked 35° to the right in a 45° nose down attitude. It is probable that the pilot became medically incapacitated in flight before being fatally injured in the impact.

SAFETY RECOMMENDATION 2004-101

It is therefore recommended that the Joint Aviation Authority (Licensing Sectorial Team) consider supporting a study of the continuing medical fitness of elderly pilots in order to ascertain whether a review of the medical requirements and periodicity for a Joint Airworthiness Authorities (JAA) Class II medical is required or, regardless of medical examination requirements, whether there should be an upper age limit placed on persons wishing to operate aircraft certificated for single pilot operations.

Response

After discussion and analysis by the Joint Aviation Authorities Licensing Division the JAA concluded that they would not support a study of the continuing medical fitness of elderly pilots in order to ascertain whether a review of the medical requirements and periodicity for a JAA Class 2 medical is required.

Furthermore, they would not support a move to place an upper age limit on persons wishing to operate aircraft certificated for single pilot operations (beyond the existing limit for commercial air transport operations).

They would, however, consider proposals for rulemaking placing restrictions on the privileges of elderly pilots such that they would be permitted to fly solo or with an appropriately licensed pilot.

Status - Partially Accepted - open

Piper PA-46-350P	Alderney Airport	30-Jan-2004	Accident
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AAIB Bulletin: 3/2005
FACTOR: F14/2005

Synopsis

The pilot reported that he obtained the appropriate weather reports from the Met Office website prior to his flight from Bournemouth to Alderney. On arrival at Alderney he flew a normal 90 kt visual approach to Runway 26 with the landing gear indicating down and locked. The pilot estimated there to be a strong surface wind of 200°/20-30 kt, so he used the 'wing down' technique to cater for the cross-wind. The aircraft touched down at the normal point on the main wheels followed by the nose wheel. After touchdown the aircraft started to veer to the right necessitating the use of left rudder and brake to correct for this. The nose of the aircraft then lowered allowing the propeller to come into contact with the tarmac, and the aircraft came to rest approximately 200 metres into the runway. The pilot transmitted a short MAYDAY, turned off the fuel and shut down the aircraft. He was then able to vacate the aircraft normally via the main door. The fire services, that were already on 'weather standby', arrived on the scene about 20 seconds later.

SAFETY RECOMMENDATION 2004-054

It is recommended that the European Aviation Safety Agency (EASA), through their Lead Authority / JAA Team of Austro Control GmbH (ACG), and the FAA make the inspection requirements of the latest revision to Piper Service Bulletin 1103 mandatory by Airworthiness Directive action.

Response

EASA 'Partially Accepted' the recommendation stating that the Agency will coordinate with the prime Airworthiness Authority for the aircraft type; the FAA to determine any need for further action.

The Atlanta Aircraft Certification Office (ACO) of the FAA stated that no decision has yet been reached as to whether AD action should be initiated. The reason for this being the issue is more complicated than just what is presented. There are actually two separate issues:

- SB 1103B - Cracks in the "feet" themselves (old style feet, two-piece welded design)
- SB 1154(Draft) - Cracks in the cluster attaching the "feet" and the engine mount tubes

The ACO intends to continue its investigation into the two issues and determine whether AD action will be initiated will be taken when it feels confident that it has a full and complete understanding of the issues.

Status - Partially Accepted - open

Sirocco 377GB	Near Ashby-de-la-Zouch, Leicestershire	27-Jan-2004	Accident
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AAIB Bulletin: 1/2005
FACTOR: F3/2005

Synopsis

The aircraft experienced an in-flight structural failure of the tailplane, which rendered it uncontrollable. This is the second such occurrence within the United Kingdom. Following a previous fatal accident in 1995, UK Sirocco aircraft were modified to address concerns over the design of the tailplane and its attachments. Although these modifications had been accomplished on G-MNDW, the tailplane had failed through loss of structural integrity and in a similar manner. The investigation identified shortcomings in the method of accomplishment of the modifications and raised further concerns over the design and construction of the tailplane and its mountings. Early during the investigation the continued airworthiness of the aircraft type was discussed with the British Microlight Aircraft Association (BMAA). Interim action to suspend the type's Permit to Fly was taken by the BMAA on 6 February 2004.

SAFETY RECOMMENDATION 2004-076

It is recommended that the British Microlight Aircraft Association (BMAA) indefinitely suspends the Permits to Fly of all UK registered Sirocco aircraft until appropriate design and modification action have been taken to restore the airworthiness of the aircraft.

Response

In addition to the immediate safety action taken on 6 February 2004, which was to suspend the validity of the Permits to Fly for the remaining Sirocco aircraft registered in the UK pending the outcome of the AAIB investigation, these permits to fly will remain suspended indefinitely, until such time as the BMAA receive an application by, or on behalf of, an owner containing appropriate design or modification submissions that will enable us to approve the continued airworthiness of the aircraft and revalidate the Permit or Permits to Fly.

Status - Accepted - closed

Piper PA-28-161

Wellesbourne
Mountford,
Warwickshire

28-Oct-2003

Accident

AAIB Bulletin: 9/2004**FACTOR: F53/2004****Synopsis**

The aircraft was being flown for the purpose of flight instructor training. The handling pilot was the instructor under training and he was seated in the right hand seat. Weather conditions were good with a surface wind of 240/07 kt. The aircraft made a normal approach and landing on Runway 18, which has an asphalt surface with 912 metres (2,990 feet) landing distance available. During the landing roll the pilots noticed some shaking through the airframe, the right wing began to lower towards the runway surface and the aircraft veered to the right. The aircraft came to rest at the right side of the runway, after which shutdown checks were completed and the crew evacuated.

The right main wheel and leg had broken away from the underside of the wing but remained attached to the aircraft by the hydraulic brake pipe.

SAFETY RECOMMENDATION 2004-014

It is recommended that the European Aviation Safety Agency (EASA) review the torque linkage in PA-28 aircraft with fixed main landing gears, with a view to implementing an improved inspection procedure for the lower torque link bolt. It is additionally recommended that EASA implement a similar procedure for the centre bolt that reinstates the intent of the Civil Aviation Authority's (United Kingdom) Additional Airworthiness Directive No. 016-02-80 Revision 1 which has now been cancelled.

Response

The UK CAA Additional Airworthiness Directives (AADs) and substantive material have been thoroughly reviewed and as a result the Agency position determined as not to issue an Airworthiness Directive (AD).

Status - Rejected - open**SAFETY RECOMMENDATION 2004-015**

Until such time as they gain experience in matters of continuing airworthiness, it is recommended that the European Aviation Safety Agency review the policy of cancellation of National Mandatory Items, including Additional Airworthiness Directives.

Status - Response Awaited - open**SAFETY RECOMMENDATION 2004-020**

It is recommended that the Federal Aviation Administration, (FAA), as certifying authority for the Piper PA-28 series of aircraft, mandate Piper Service Letter No 842, which called for an improved inspection procedure for the bolt attaching the upper and lower links in the main landing gear torque link assembly. It is further recommended that a similar inspection procedure should be mandated for the lower torque link bolt.

Status - Response Awaited - open

Robin DR400-180	Little Staughton Airfield, Bedfordshire	26-Sep-2003	Accident
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AAIB Bulletin: 2/2005

FACTOR: F7/2005

Synopsis

The aircraft was being flown to an airfield for some pre-arranged scheduled maintenance. Shortly after a normal landing the aircraft veered violently to the left and the nose landing gear (NLG) collapsed. The nose landing gear was submitted for a detailed metallurgical examination which established that a fatigue failure had occurred in the narrow strap section of the upper support plate which had been the result of the circumferential separation of the fillet weld between the upper support plate and the outer cylinder and normal in-service loads. The weld was found to be of very poor quality. The cross-sectional dimensions of the weld were inadequate around the complete circumference for the type of joint and there was gross gas porosity in the area of the separation. Further examination revealed gross gas porosity throughout the complete circumference of the weld. The examination also revealed that the weld was the original manufacturing weld.

SAFETY RECOMMENDATION 2004-086

It is recommended to the manufacturer, Apex Aviation, that Service Bulletin 101 be re-issued to include the inspection of the Upper Support Plate in the same areas as those specified on the Lower Support Plate.

Response

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-087

It is recommended that the Director Generale de L'Aviation Civile (DGAC), France as lead agency for the European Aviation Safety Agency (EASA), re-issue Airworthiness Directive No. 83-206(A) to include the inspection of the Upper Support Plate in the same areas as those specified on the Lower Support Plate.

Response

EASA will coordinate with the DGAC, France to determine any need for further action.

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-088

It is recommended that the Director Generale de L'Aviation Civile (DGAC), France assess the standard of welding made by Apex Aviation to ensure that it meets the European and French requirements and standards for the manufacture of aviation components.

Response

EASA will coordinate with the DGAC, France to determine any need for further action.

Status - Response Awaited - open

Stampe SV4C-C	Near Redhill, Surrey	26-Jul-2003	Incident
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AAIB Bulletin: 10/2004
FACTOR: F46/2004

Synopsis

The pilot, who was also the owner of the aircraft, departed from Runway 19 at Redhill Aerodrome, turned left onto a northerly heading and levelled off at 1,000 feet, with the engine at 1,900 RPM. The pilot's intention was to practise aerobatics to the north of the M25 but, about one mile to the north of the airfield, the engine faltered and the pilot saw an object fly off from around the propeller hub. This was followed almost immediately by the pilot observing the propeller detach itself from the engine. He closed the throttle, turned off the engine switches and made a MAYDAY call to Redhill, stating that he had lost his propeller and was making a forced landing.

Looking for a suitable landing area, the pilot found his options were very limited by standing crops. He then noticed a green area which was upwind and he was able to make a successful 'three point' landing. He found that he had landed in a former quarry which had been filled and grassed over. The pilot made his way by foot to the security guard at the gate and he was able to contact the airfield by telephone. The police arrived soon afterwards.

SAFETY RECOMMENDATION 2004-075

It is recommended that the UK Civil Aviation Authority specifies a calendar time limitation for Gipsy engines, at least for those aircraft operating in the Public Transport and Aerial Work categories, to cover areas where periodic predictive inspections are not effective.

Response

The CAA partially accepts this recommendation. The CAA will assess all related data and consult with known owners and operators to consider the need to define appropriate calendar time limits for Gipsy engines to cover areas where periodic predictive inspections are not effective. This will be complete by March 2005.

CAA Action

The CAA completed a review in March 2005 of current requirements and service experience, encompassing the issues relating both specifically to the G-OODE crankshaft failure, and to operation of high calendar time engines, particularly for the purpose of public transport.

The review demonstrated that service experience on the Gipsy engines does not support the link between corrosion and cracking indicated by the failure affecting G-OODE. In particular, crankshaft inspection records show that whilst extensive corrosion is frequently the reason for rejection of crankshafts, none of these crankshafts has shown evidence of cracking in the area of the crankpins or journals. Furthermore, an earlier AAIB investigation (ref. Bulletin 4/97) of a similar crankshaft failure did not find any evidence of corrosion, and concluded that an unrecorded event, such as propeller strike, was the most likely cause. The CAA considers that, despite the presence of corrosion in this recent case, the broader service experience supports the AAIB's conclusion of the cause of the earlier event. Shock loading can occur at any time in the life of an engine, and a mandatory calendar life would not be considered an appropriate response to address this risk. Instructions for appropriate inspections are already in place for operators to follow in the event of a shock loading occurrence.

In addition to the service history of Gipsy crankshafts, the review also considered the wider issues relating to operation of high calendar time engines, particularly for the purpose of public transport. The operating environment of the Gipsy engine, and of many other piston engine types, has changed considerably since their initial entry into service. Typical utilisation rates have reduced to very low levels, so that the possibility of extremely high calendar times now exists, even when operated within the operating time limitations permitted for public transport

use by CAA Airworthiness Notice Number 35 (AN35). This is particularly apparent for aircraft that are used for the purpose only of public transport after a long period of low utilisation in private category operation.

In response to this growing trend, the manufacturers of Textron Lycoming and Teledyne Continental piston engines introduced a recommended calendar time of 12 years. Recent changes have been introduced to AN35 to ensure that engines used for public transport are not operated beyond 120% of such recommendations. However, engine types for which no manufacturer's recommendation exists are not currently calendar-time limited.

The CAA has therefore concluded that there is a need to introduce a recommended calendar time between overhauls for all piston engine types for which no manufacturer's recommendation exists and a further revision to AN35 will be published to this effect in September 2005.

Status - Partially Accepted - open

Cessna F152	Headcorn Aerodrome, Kent	01-Jul-2003	Accident
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AAIB Bulletin: 5/2004
FACTOR: F23/2004

Synopsis

The instructor and her student were on a training flight from Lydd to Headcorn. The student who had accumulated 36 hours was the handling pilot and the intention was to do a touch and go at Headcorn and then return to Lydd. The engine power checks at Lydd were normal and the acceleration during takeoff was also reported as normal. During the cruise, at an altitude no higher than 2,100 feet, they observed some showers in the area and applied carburettor heat several times as a precautionary measure. After a direct join to the downwind leg at Headcorn, the student applied carburettor heat for approximately 10 seconds and then set it back to COLD. On base leg the student re-applied carburettor heat and reduced the power to 1,700 RPM to begin a descent. The aircraft was lined-up on finals for an approach to Runway 29 (grass) with full flap (30 degrees) at 65 KIAS. At approximately 200 feet agl the student set the carburettor heat back to COLD.

The instructor reported that the final approach was stable and she estimated that the aircraft touched down 30 feet beyond the runway threshold marker boards. During the landing roll the instructor reduced the flap setting to 10° and visually checked that the flaps had been retracted to this position. She then realised that the aircraft was not accelerating normally and called to the student "Full power! Full power!" She then placed her hand on the throttle, over the student's hand, and confirmed that the throttle was set to full power. She glanced at the RPM gauge, which was indicating approximately 2,100 RPM. The aircraft was still not accelerating normally and the airspeed indicator was rising slowly. At approximately 40 to 45 KIAS the instructor took control and aborted the takeoff because she did not believe the aircraft would gain sufficient speed to clear the hedge at the end of the runway. She closed the throttle, pulled the yoke aft and applied the wheel brakes. At this point she estimated the aircraft had used up more than two thirds of the runway length (landing distance available was 796 metres). The braking action was not very effective and the instructor believed that they were probably skidding on the short wet grass. The aircraft ran off the end of the runway and penetrated a hedge approximately 180 metres from the runway threshold. It came to a rest on a country road on the other side of the hedge. Both pilots had been wearing lap and diagonal harnesses and were able to exit the aircraft unaided and uninjured.

SAFETY RECOMMENDATION 2004-001

The CAA should sponsor or conduct research to determine:

- a. How readily carburettor ice can form at low power settings with carburettor heat ON;
- b. How quickly carburettor ice can form when carburettor heat is OFF;
- c. Whether the Authority’s advice on the use of carburettor heat during an approach to land should be revised in the light of its research findings.

Response

A CAA sponsored research programme has been initiated at Loughborough University to investigate a wide range of issues relating to Carburettor Icing. The scope of this research includes the need to determine the propensity for carburettor ice to form with the carburettor heat in both the on and off positions.

The CAA’s advice on the use of Carburettor Icing during an approach to land will be reviewed against the conclusions of this research and revised as necessary.

This work is expected to be complete by December 2005.

Status - open (Appropriate Action Implemented / Planned)

Denney Kitfox MK4	Smeeton Westerby, Leicestershire	13-Jun-2003	Accident
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AAIB Bulletin: 3/2004
FACTOR: F20/2004

Synopsis

The aircraft was being flown on one of a series of test flights, which were required before it could be issued with a Permit to Fly. The aircraft had been airborne for 15 minutes and, having completed some handling tests, was returning to Leicester Airport at 1,500 feet QFE when the engine stopped. The commander selected what he considered to be the only suitable field for a forced landing, knowing that it contained a standing cereal crop. He did not attempt to restart the engine or transmit a radio call because he decided that his priority should be to fly the aircraft.

With the aircraft flying just above the level of the top of the cereal crop its speed reduced and it started to sink. As the mainwheels contacted the crop, which the crew estimated stood two and a half feet tall, the aircraft pitched forward and came to rest inverted after travelling a further 30 to 40 feet. The pilots released themselves from their harnesses and exited the aircraft through the doors, which had already sprung open during the accident. All three emergency services attended the scene but there was no fire and the occupants of the aircraft were uninjured. The commander had particular praise for the four-point shoulder and lap harnesses, which he believes had saved both he and his fellow pilot from injury.

Subsequent examination revealed that the engine failure was the result of fuel starvation caused by debris in the fuel pipe and fuel pump. The debris was identified as a rubber jointing compound, which had been used to connect rubber fuel pipes to metal hose nipples during construction. During a previous ground run this substance had been responsible for a blockage in the fuel system causing the engine to stop. The commander, who is also a PFA inspector, had advised the owners to remove the jointing compound from the fuel system following the ground run. In hindsight he considers that the fuel system should have been replaced, but without the use of rubber jointing compound on the rubber to metal joints.

SAFETY RECOMMENDATION 2004-010

The Popular Flying Association should issue a technical instruction, which contains advice on the suitability of rubber jointing compound and alternate methods of achieving fuel tight joints in aircraft fuel systems.

Response

Status - Response Awaited - open

Spirit of St Louis Replica	Coventry Airfield	31-May-2003	Accident
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**AAIB Bulletin: 1/2004
FACTOR F10/2004**

Synopsis

Shortly after takeoff from Runway 23, whilst climbing and manoeuvring gently to begin its display sequence, the aircraft's right wing suffered a major structural failure and the aircraft fell steeply into an industrial compound bordering the airfield. There was no post impact fire. The pilot survived the impact, but died shortly afterwards from his injuries. The failure in fatigue of a combined right landing gear and wing strut support fitting was determined to have precipitated the wing failure.

SAFETY RECOMMENDATION 2003-116

The CAA, in conjunction with the Department for Transport, should review the process by which foreign registered replica homebuilt aircraft are granted Exemptions to Article 8(1) of the Air Navigation Order, which permits such aircraft to fly within UK airspace and at public air displays, without an appropriate Certificate of Airworthiness. Such a review should consider the possibility of requesting specific assurance from the State of Registry that such aircraft are maintained, and records have been kept, in accordance with the requirements of that State.

Response

The CAA, in conjunction with the Department for Transport, will review the process by which foreign registered replica homebuilt aircraft are granted Exemptions to Article 8(1) of the Air Navigation Order, which permits such aircraft to fly within UK airspace and at public air displays, without an appropriate Certificate of Airworthiness. The review will consider the possibility of requesting specific assurance from the State of Registry that such aircraft are maintained, and records have been kept, in accordance with the requirements of that State. It is planned to complete this review by end-December 2004.

CAA Action

The CAA, in conjunction with the DfT, has completed a review of the process by which foreign registered aircraft, including replica aircraft, are granted Exemptions to Article 8 (1) of the Air Navigation Order, which permits such aircraft to fly within UK airspace without a certificate of airworthiness being in force.

The CAA firmly believes that measures taken and standards employed at construction within the State of Registry has the greatest influence over flight safety and structural integrity of foreign homebuilt aircraft to the greatest degree. It is also a fundamental principle that a State of Registry should establish the conditions to ensure the ongoing continuing airworthiness of an aircraft that is issued with an airworthiness certificate in their country. Measures taken in this country, beyond the inspection for validity of documents, will not be able to compensate for any hidden failures or latent causal factors existing in foreign homebuilt aircraft.

The CAA conclusion is that the present policy for the issue of Exemptions, including homebuilt replica aircraft, is proportionate to the risks associated with such aircraft operating in the UK.

Status - Accepted - closed

Piper PA-34-200T	Sherburn-in-Elmet Aerodrome, Yorkshire	08-May-2003	Accident
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AAIB Bulletin: 5/2004
FACTOR: F24/2004

Synopsis

After completing the power and pre-takeoff checks, the handling pilot taxied the aircraft past the holding point in order to line up on Runway 29. At a reported groundspeed of approximately 5 to 7 kt the nose gear leg suddenly collapsed. The aircraft slid approximately 30 feet and came to rest with its nose and both propellers touching the ground. The aircraft was shut down and both occupants evacuated the aircraft via the main door. The probable cause of the nose gear collapse was a mis-rigged nose gear downlock spring link.

SAFETY RECOMMENDATION 2004-007

It is recommended that the Federal Aviation Administration, as the primary certificating authority for the Piper PA-34 Seneca aircraft series, should require the aircraft manufacturer to provide a clear and unambiguous description of the operation of the nose gear downlock spring link, its installation and its correct rigging by both narrative and pictorial means.

Response

The FAA's Atlanta Aircraft Certification Office recommends:

1. The nose gear on all models of the Piper Seneca's, upon reaching 5000 hours total time in service, be removed, the trunnion attach areas be stripped, and a minimum dye penetrant inspection be performed. As this inspection produces results, the time intervals can be adjusted.
2. The nose gear upper drag link bolt, part number AN7-35, be inspected immediately.
3. An Airworthiness Directive (AD) to be issued for installation of Ground Steering Limitation Markings on PA-34 aircraft nose and inspection of nose gear steering stops.
4. To investigate the causes of reported cases of Piper Seneca NLG collapse. Consideration to be given to design modification, which should minimise movement of the drag brace resulting from loads applied to the nose landing gear, and to ensure sufficient force is applied to the drag brace to retain it in the locked condition.
5. The New Piper Aircraft Company should review and amplify the instructions for rigging the NLG downlock mechanism contained in the Piper PA-34 Maintenance Manual.

The Atlanta ACO, in conjunction with the New Piper Aircraft Inc., have reviewed the above APR's, along with PA-34 service information and relevant design data and concur with the above recommendations. Piper has generated Service Bulletin SB1123 to address the above areas of concern and additionally provide instruction for inspection and possible replacement of the critical components of NLG. The Revision 'A' of this Service Bulletin has been reviewed by the FAA and was released on November 30, 2004.

APR 02.263 addresses STC SA00979NY installed on PA34-200 and PA-34-200T NLG. The STC installs a spring assembly mounted on the drag brace and an aluminium angle to the rear actuator support bracket. This APR recommends the following:

1. Owner operators, have the mounting bracket inspected for cracks and thereafter at 100 hours, or in the event of a hard landing.
2. Issue a Special Airworthiness Information Bulletin (SAIB)
3. Issue an Airworthiness Directive for aircraft that have been modified in accordance with STC SA00793NY. After review of APR 02.263 the Atlanta ACO has concluded that the failure of the existing bracket, modified in accordance with STC SA0079NY is not caused by the modification. To the contrary, the installation of the STC should aid in preventing nose landing gear failure.

The FAA also believe that Piper's SB 1123 provides information regarding inspection and replacement of cracked bracket referenced in this APR. Therefore the FAA disagree with the recommendations and believe that Service Bulletin 1123A will address concerns of this APR as well.

APR 04.019 notes that recently Piper released Service Bulletin (SB) 1123 (PA-34 Series Aircraft Nose Gear inspection and Product Improvement), initial release, does not address the proper description of the operation of the nose gear down-lock spring, its installation and its correct rigging. The APR therefore recommends that the Maintenance Manual be revised to address these issues by both narrative and pictorial changes. The New Piper Aircraft has revised the SB 1123 to provide the rigging and adjustment instructions for the nose gear down-lock spring link. The FAA believe release of the revision 'A' of SB 1123 and mandating the inspection instructions referenced in this SB will satisfy the intent of the above safety recommendations. An AD proposal worksheet has been generated and was sent to Small Aircraft Directorate on December 13, 2004 for processing. The AD proposal mandates inspections instructions referenced in the SB 1123A.

Status - Accepted - closed

Yak 52	Two miles north-east of Towcester	05-Jan-2003	Accident
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**AAIB Bulletin 10/2003
FACTOR F37/2003**

Synopsis

The pilot was a member of a syndicate who operated the aircraft from a private farm strip at Cuddesdon, Oxfordshire. On the morning of the accident he arrived at the farm strip with his brother who was to fly in the rear seat as a passenger. His brother was also a qualified pilot although less experienced. The aircraft, which was started with the help of another syndicate member, then departed Cuddesdon and flew to Turweston Airfield to refuel. The pilot and passenger re-entered the cockpit when the refuelling was complete. Both were seen to be wearing flying suits, parachutes and helmets. They then departed Turweston, from Runway 27, at 1110 hrs and flew to the north-east. The pilot informed the air ground radio operator that they were intending to carry out aerobatics to the north-east of the airfield for approximately 30 minutes before returning to Turweston to refuel again. The weather in the area was fine with no cloud, a light north-westerly wind and a temperature of +1°C.

Five minutes later the aircraft was observed flying aerobatics two miles to the north-east of Towcester. After flying a sequence of manoeuvres lasting approximately 10 minutes the aircraft was seen to enter a vertical climb and execute a stall turn. The aircraft completed the manoeuvre and began a vertical descent, from which there was no apparent sign of recovery. It impacted the ground directly beneath power lines without disrupting the electrical supply. There was no fire and the rescue services arrived at the scene 15 minutes later. Both pilot and passenger were fatally injured.

SAFETY RECOMMENDATION 2003-072

The CAA should publicise the circumstances of this accident in order to bring to the attention of Licensed Engineers (LAE) and maintenance organisations the need for them to have in place an effective tool system that reduces the likelihood of tools being left in aircraft after maintenance.

Response

The CAA will publicise the circumstances of this accident, including the need to have in place an effective tool system that reduces the likelihood of tools being left in aircraft, by means of an article in GASIL in November 2003 and an Airworthiness Notice in March 2004.

CAA Action

Airworthiness Notice 12 Appendix 7 entitled Foreign Object and Loose Articles, was issued in April 2004.

Status - Accepted - closed

Cessna 152	Chenies, Buckinghamshire	28-Sep-2002	Incident
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AAIB Bulletin: 3/2004
FACTOR: F15/2004

Synopsis

The commander of the aircraft, a flying instructor, reported that he departed from Denham, with the student pilot handling, on a dual training flight. The aircraft climbed initially to 1,000 feet on the Denham QNH before initiating a further climb at Chalfont St Giles (approximately 5 nm from Denham), levelling at 1,900 feet over Amersham, (some 8 nm NNW of Denham). The aircraft was turned right towards Maple Cross and Denham Information/Radio was called for rejoin information.

The Instructor stated that carburettor air was selected hot and power reduced from 2,100 RPM to 1,800 RPM to commence a descent towards Maple Cross. A routine check (FREDA) was then carried out and all engine indications appeared to be normal. The Denham QFE was set and at a point some 5 nm north of Denham, the instructor remarked to the student that the aircraft was slightly high. The student therefore reduced power to approximately 1,700 RPM. Shortly afterwards the engine lost power, its speed decreasing to about 1,000 - 1,100 RPM.

The student opened the throttle but obtained no response from the engine. The instructor then operated the throttle with little effect; the engine spluttered and its speed increased by 50 – 100 RPM.

The instructor therefore took over control and turned the aircraft away from a built-up area. He tried the effect of various throttle settings with the carburettor air control in both the hot and cold positions but was unable to obtain any increase in engine power and subsequently transmitted a distress call. He then selected a field, established the aircraft on a right hand base leg and desisted from making further attempts to obtain power from the engine. He selected 20 degrees of flap on the base leg and made a right hand turn onto a final approach, before selecting full flap.

The instructor noticed a low fence, half way along the field, which he was able to fly over. He stated that crash drills were carried out; however, he did not consider, or have time, to switch off the fuel or the battery master switch. Seat belts were tightened and both doors opened. A normal touch-down was made with the stall warner sounding and the Instructor brought the aircraft to a halt despite the downslope of the chosen field. The engine was then found to be operating at idle power so the instructor shut it down and the aircraft was vacated.

SAFETY RECOMMENDATION 2004-011

The Civil Aviation Authority should consider the safety implications of Rule 5 with respect to its effect on realistic training for engine failure after takeoff and en route engine power loss on single engined aircraft and publish a paper on the subject, for the information of Flight Instructors, making clear the Authority’s philosophy and promulgating what they believe to be acceptable best practice.

Response

The CAA partially accepts this Recommendation. The CAA has recently reviewed Rule 5 in its entirety and takes the view that, practice of Engine Failure After Take-Off (EFATO) in single engine aeroplanes can be conducted effectively and realistically without infringement of Rule 5.

The CAA has taken steps to ensure that guidance on this topic is included in the seminars required for revalidation of Flight Instructor (FI(A)) ratings and Flight Instructor Examiner (FIE(A)) authorisations with immediate effect. Further guidance will be promulgated to all holders of a current FI(A) rating through the CAA’s routine advisory document (TrainingCom).

Status - Partially Accepted - closed

Miles Gemini 1A	Old Warden Aerodrome, Bedfordshire	24-Aug-2002	Incident
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AAIB Bulletin: 2/2005
FACTOR: F9/2005

Synopsis

The aircraft had been on a local flight when, whilst descending at a low throttle setting in the overhead of the airfield, the pilot heard a ‘thump’. He then observed the left propeller, which had become detached from the engine, flying away after striking the nose of the aircraft. The aircraft returned to the airfield and landed without further incident. The propeller was recovered from a nearby field together with the hub sleeve; none of the propeller retaining bolts were found in the field but two of the bolt heads remained with the aircraft and were recovered from the cowling.

The owner of the aircraft had acquired it relatively recently and had flown it more frequently than had been the case in the recent past. The aircraft was being maintained to the Light Aircraft Maintenance Schedule (LAMS) and no special conditions or out-of phase maintenance items had been imposed. The last scheduled maintenance performed had been an Annual check, in February 2002, at which time the tightness of the attachment bolts of both propellers had been checked as required. Between that time and the incident, the aircraft had accumulated a further 24 hours flying time.

SAFETY RECOMMENDATION 2004-104

The Civil Aviation Authority should, when approving the application of the Light Aircraft Maintenance Schedule to historic aircraft, review the appropriateness of the resulting inspection intervals against those of the original Maintenance Schedule, if this is available, and require out of phase maintenance actions where appropriate.

Response

The Light Aircraft Maintenance Schedule (LAMS) is an approved document based on a series of generic requirements that places responsibility on an owner / operator to supplement the basic inspections to suit their particular aircraft.

CAP 520 and Section 3 of LAMS currently places responsibility on an owner / operator to ensure that service information published by the type design organisation be formally technically assessed and if required adopted to ensure operational safety and reliability.

The CAA has published edition 4 of CAA/LAMS/A/1999 Issue 1 in February 2005 and Section 3 has been revised to further emphasise and clarify the need to include amendments to reflect applicable instructions for continuing airworthiness as part of the maintenance schedule.

Status - Accepted - closed

Piper PA-24-250	Osea Island, Essex	12-May-2001	Accident
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AAIB Bulletin: 12/2002

FACTOR: F24/2002

Synopsis

The left seat pilot on the accident flight had been a part owner of G-ARIE since 1995. He had held a PPL since 1992 and his most recent revalidation for his single-pilot, single-engine rating had been 3 July 1999. He had a total of 265 hours flying experience of which 130 hours were on type. In accordance with Joint Aviation Requirements - Flight Crew Licensing (JAR-FCL) 1.245(c)(1), this revalidation was required every two years and, as a consequence, the pilot had made a private arrangement with a Qualified Flying Instructor (QFI) to fly a one hour dual flight in G-ARIE. No witnesses were found to confirm the intended profile of the flight although Aeronautical Information Circular (AIC) 127/1999 details the content of such a flight. The QFI had been a flying instructor since 1991.

An acquaintance had sat with the two pilots before the flight and saw them walk out to G-ARIE. He saw the pilot sit in the front left seat and the QFI sit in the front right seat. One witness heard a sound of 'backfiring' during engine start but no other unusual events were reported. Take-off appeared normal at approximately 1515hrs. The acquaintance described the weather as 'CAVOK' with the surface wind as 10 to 12 kt from the northeast.

Numerous eye witnesses, on the surface, near Osea Island saw the final manoeuvres of G-ARIE. Most described it as being in a descent, pointing nose down and "spiralling" or "spinning". Additionally, a pilot who was flying a Yak 11 in the area also saw the aircraft spinning. This pilot was flying between 2,500 and 3,000 feet amsl when he saw the aircraft to his left and below him; he described it as being in a spin to the right with a nose down pitch attitude of about 60deg. Initially he thought that it was a training spin but became puzzled as it continued to spin and so he flew towards the area. He saw about four to six complete turns before the aircraft impacted the ground; as it did so, he saw a ring of spray from the crash site.

Numerous personnel alerted the emergency services. The Yak pilot transmitted a 'Mayday' call on 121.5 Mhz and remained over the crash site until the emergency helicopters arrived; the 'Mayday' call was recorded at 1527hrs. The RAF Search and Rescue (SAR) helicopter reported on the frequency at 1533hrs and was in visual contact with the Yak at 1541hrs. By 1547hrs, the RAF helicopter, a police helicopter and an air ambulance helicopter were on the scene and had confirmed that the accident had been fatal. The police had recorded the first telephone call from the public at 1529 hrs.

All the witnesses described the weather as very good with a clear horizon. The pilot of the RAF rescue helicopter estimated that the visibility was about 15km although the horizon was "hazy".

SAFETY RECOMMENDATION 2002-023

The Civil Aviation Authority should develop an appropriate recognised performance specification against which carbon monoxide detectors can be assessed and approved, with the eventual aim of mandating their use on all piston engine aircraft.

Response

The CAA partially accepts this Recommendation.

The CAA will commission a feasibility study to determine whether an appropriate airworthiness specification could be developed that would form the basis for a practicable and cost effective CO detector for aviation use. This study will investigate also whether any of the currently available domestic detectors would work sufficiently reliably in the aircraft environment.

The target for completion of this feasibility study is 31 December 2003.

Until the feasibility study is complete, it would be inappropriate for CAA to commit to an action to mandate carriage of an instrument, which may eventually prove impractical or not cost effective to produce.

CAA Action

The CAA considered it feasible to develop an appropriate performance specification for CO detectors. Since 28 September 2003, the European Aviation Safety Agency (EASA) has been the organisation responsible for setting the design standards for most aircraft operated in the European Union. To assist EASA in addressing this recommendation, CAA commissioned an aviation consultant to produce a draft performance specification for a CO detector suitable for aviation use. The draft specification was delivered to CAA in March 2005, and is in a form suitable for establishing the foundation of a new European Technical Standards Order (ETSO). CAA is now developing proposals for regulatory action and supporting justification material for submission to EASA. This, together with the draft ETSO will be submitted to EASA in July 2005, with a request that EASA takes rulemaking action to reduce incidents of CO caused pilot incapacitation.

Status - Partially Accepted - open

Piper PA-28-180	Nayland Airfield, Suffolk	28-Apr-2001	Accident
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AAIB Bulletin: 1/2004

FACTOR: F7/2004

Synopsis

The aircraft, flown by two qualified and experienced pilots, suffered a power loss necessitating a forced landing. At that time the aircraft was in a position to land on Nayland airfield in Essex. At a late stage in the approach however, the handling pilot was unable to prevent the aircraft's right wing from impacting with a large tree; the right wing was torn from the fuselage and the aircraft came to rest inverted on its right side. Both pilots, one of whom was seriously injured, were able to vacate the cabin with external assistance. The fuel selector was selected to the right tank, that was ruptured in the impact, and although it was not possible prove that this tank contained fuel at impact calculations showed that it should have contained approximately 8 US Gallons. Subsequent examination and testing of the engine and its components revealed no anomalies and it was concluded that, due to the ambient weather conditions at the time, induction system icing was the most likely cause of the power loss. A recommendation has been made to the CAA for measures to be taken to significantly reduce the numbers of accidents resulting from forced landings, brought about by induction system icing.

SAFETY RECOMMENDATION 2003-125

It is recommended that the CAA take measures, both technological and procedural, including the review and promulgation of published material and the re-assessment of warning systems and their capabilities and reliability, to significantly reduce the number of potential accidents, to UK registered piston-engined aircraft, resulting from engine failures brought about by induction system icing.

Response

The CAA partially accepts this recommendation. On 28 September 2003, responsibility for the technological measures addressed in this Recommendation passed to the European Aviation Safety Agency (EASA) under Regulation (EC) 1592/2002 and the recommendation should be addressed to that Agency. Nevertheless, the CAA has been drafting new design requirements intended to prevent induction system icing and these will be forwarded to the EASA by March 2004.

With regards to the procedural measures, a CAA sponsored research programme has been initiated. This programme will review both the adequacy of the current carburettor ice prevention operating procedures and the viability of warning systems. This research is due to be completed by December 2005. The CAA is also reviewing the PPL training syllabus to ensure that the subject of carburettor icing is adequately addressed. This review will be completed by July 2004. In the meantime, the CAA will continue to publicise widely the problem of carburettor icing.

CAA Action

A change to the engine design certification requirements was introduced in the initial issue of the EASA Certification Specification for Engines (CS-E) which was published in October 2003. This change now requires provision for the fitting of an induction thermometer or ice indicator as appropriate for the control of ice prevention systems.

The CAA will review the output from the research activity to assess the potential need for further rulemaking.

A review of the PPL training syllabus has been completed. This has shown that based upon our current understanding the subject of carburettor icing is adequately addressed. However this will be re-evaluated as necessary, along with the subjects of ice prevention operating procedures and potential warning systems, in light of the results of the current research programme.

Status - Partially Accepted - open

Section 4

Microlights

Pegasus Quik	Eastchurch, Isle of Sheppey, Kent	21-Aug-2004	Accident
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AAIB AAR: 2/2005 (To be published 15 November 2005)

FACTOR: FACTOR TO BE ISSUED

Synopsis

The Pegasus Quik microlight, with an instructor and passenger on board, departed Rochester Airfield for a trial lesson. Thirty five minutes into the flight, as it was flying at 500 ft along the north coast of the Isle of Sheppey, it pitched up steeply to the near vertical and entered a series of tumbling manoeuvres. As the microlight tumbled the trike unit, containing the two occupants, separated from the wing and descended vertically to the ground. Neither the pilot nor his passenger survived the impact. The initiation of the pitching moment and subsequent entry into the tumbling sequence was brought about by the failure of the right upright upper fitting, which caused full nose-up trim to be suddenly applied.

Some time previously the microlight's uprights upper fittings had been modified to comply with Service Bulletin 116 requiring the fitting of additional rivets. The additional rivets were not only fitted incorrectly, and without reference to the Service Bulletin, but two of them did not match the specification of those rivets supplied by the manufacturer in the modification kit. Additionally, no duplicate independent inspection was carried out on the correct embodiment of the modification.

SAFETY RECOMMENDATION 2004-080

It is recommended that the British Microlight Aircraft Association, take the necessary immediate steps to ensure the continued safe operation of the Pegasus Quik microlight aircraft with regard to the application of Service Bulletin 116 issue 2.

Response

Mandatory Permit Directive 2004 009 R2, requiring Service Bulletin 116 Issue 2 to be undertaken before the next flight, was issued by the CAA on 29 September 2004.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-081

It is recommended that the British Microlight Aircraft Association consider reviewing its policy, procedures and standards with regard the implementation and inspection of 'field fitted' modifications and service bulletins.

Response

The BMAA advised the AAIB that they would consult widely and produce a Code of Practice, which would be published as a BMAA Technical Information Leaflet.

Status - Accepted - closed

Puma Sprint	Sandbach, Cheshire	15-Aug-2004	Accident
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AAIB Bulletin: 12/2004
FACTOR: F1/2005

Synopsis

During a normal landing on a grass strip, the nose wheel assembly became detached from the microlight causing it to roll forward seriously injuring the pilot and passenger. The failure of the nose wheel assembly was caused by a fatigue fracture of the 'snoot', which grew from a probable defect in the weld securing the nose wheel mounting bush to the 'snoot'.

SAFETY RECOMMENDATION 2004-089

It is recommended that Medway Microlights should require the welds securing the nose wheel assembly mounting bush to the snoot fitted to Puma Sprint, Raven and Raven X microlight aircraft, to be inspected for cracks at the earliest opportunity.

Response

Medway Microlights advise they will be issuing a Service Bulletin.

Status - Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2004-090

It is recommended that Medway Microlights review the maintenance and inspection requirements and life expectation of the snoot assembly fitted to the Puma Sprint, Raven and Raven X microlight aircraft.

Response

Medway Microlights advise they will be issuing a Service Bulletin.

Status - Accepted - open (Appropriate Action Implemented/Planned)

CFM Streak Shadow SA	Old Sarum, Wiltshire	17-Sep-2003	Accident
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AAIB Bulletin: 5/2004
FACTOR: F25/2004

Synopsis

During the take-off run, a weld connecting the right stub axle to the right landing gear strut, failed. The end of the strut contacted the ground and twisted rearwards, the aircraft veered to the right and came to rest just off the runway. Fuel leaked from the slipper fuel tank located beneath the fuselage, as a result of the rearward twisting of the landing gear having crushed, and holed, the top of the slipper tank. The investigation revealed the very poor standard of this weld on this aircraft, and on eight other examples examined, suggesting that many other aircraft might be similarly affected.

SAFETY RECOMMENDATION 2004-002

The UK Civil Aviation Authority, in conjunction with the British Microlight Aircraft Association (BMAA) and the Popular Flying Association (PFA), should review the adequacy of the main landing gear lower fittings currently in service on Shadow aircraft, in light of the evidence

suggesting that significant numbers of these are likely to contain weld defects which significantly reduce their static strength compared with that assumed at the time of certification.

Response

The CAA in conjunction with the British Microlight Aircraft Association (BMAA) and the Popular Flying Association (PFA), has reviewed the adequacy of the main landing gear lower fittings currently in service on Shadow aircraft. As a result of this review, a new main undercarriage has been developed and is in the process of being approved under the control of the BMAA and PFA. This new undercarriage includes a redesigned lower fitting with increased strength and post welding heat treatment. The UK CAA has issued Mandatory Permit Directive 2004-007 making the replacement of the standard undercarriage mandatory on all UK registered Shadow, Streak Shadow and Starstreak aircraft types under the control of the PFA.

CAA will revise this MPD to address BMAA aircraft when the BMAA modification approval process has been completed.

Status - Accepted- closed

SAFETY RECOMMENDATION 2004-003

The UK Civil Aviation Authority, in conjunction with the British Microlight Aircraft Association (BMAA) and the Popular Flying Association (PFA), should review the adequacy of the slipper fuel tank mounting arrangement, insofar as this makes the tank vulnerable to fracture and leakage of fuel during any incident which causes a rearward rotation of the gear about its attachment to the fuselage.

Response

This CAA accepts this recommendation. The CAA in conjunction with the British Microlight Aircraft Association (BMAA) and the Popular Flying Association (PFA), has reviewed the adequacy of the slipper fuel tank mounting arrangement, insofar as this makes the tank vulnerable to fracture and leakage of fuel during any incident which causes a rearward rotation of the gear about its attachment to the fuselage. The new main undercarriage, developed under the control of the BMAA and PFA, includes strengthened main undercarriage attachment fittings and reinforcement of the fuselage floor at the attachment point, to prevent rotation of the gear about its attachment point and minimise the risk of slipper tank fracture and leakage of fuel. The UK CAA is in the process of mandating the replacement of the standard undercarriage on all UK registered Shadow, Streak Shadow and Starstreak aircraft types.

Status - Accepted - closed

Skyranger 912(1)	Barton Airfield, Manchester	08-Jul-2003	Accident
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AAIB Bulletin: 11/2004
FACTOR: F51/2004

Synopsis

Just after takeoff, at an estimated height of 40 feet, the aircraft was seen to roll to the left. The bank continued to increase to the point where the nose dropped and the aircraft descended and struck the ground in a steeply banked, nose down attitude. The aircraft came rapidly to a halt with the pilot trapped in the wreckage having suffered serious injuries. An engineering investigation revealed that the aileron cables had been rigged in the reverse sense to normal.

SAFETY RECOMMENDATION 2004-048

It is recommended that the PFA and the BMAA ensure that as aircraft, which are certificated to the requirements of BCAR Section S, continue in service, no degradation of any distinctive

markings applied to the flight control systems connections intended to minimise the possibility of cross connection of flight controls during the aircraft rigging process, occurs.

Response

The PFA published 'PFA Notes to Aircraft Inspectors (SPARS) Incidents & Defects' in October 2004 and an article in the Popular Flying Magazine in January 2005.

BMAA Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-049

It is recommended that the Civil Aviation Authority, in conjunction with the British Civil Airworthiness Requirements (BCAR) Section S steering group, amend the requirements so that all elements of the flight control systems of new aircraft types certified to BCAR Section S rely solely upon design features in order to prevent flying control cables or rods being cross connected during the aircraft rigging process.

Response

The CAA partially accepts this Recommendation. The CAA, in conjunction with the BCAR S Working Group, will, by the end of April 2005, review and consider an amendment to the requirements so that all elements of the flight control systems of new aircraft types certified to BCAR Section S rely solely upon design features in order to prevent flying control cables or rods being cross connected during the aircraft rigging process.

CAA Action

The Civil Aviation Authority, in conjunction with the British Civil Airworthiness Requirements (BCAR) Section S Steering Group, has reviewed the recommendation to amend the requirements so that all elements of the flight control systems of new aircraft types certified to BCAR Section S rely solely upon design features in order to prevent flying control cables or rods being cross connected during the aircraft rigging process. The review has established that the BCAR S requirement, S685d), is identical to the corresponding requirement of CS 22, CS VLA and CS 23, which all require design features or permanent and distinctive marking to minimise the possibility of incorrect assembly of the control system. The CAA and BCAR Section S Steering Group consider the existing requirement to be adequate.

Status - Partially Accepted - open

Section 5

Rotorcraft 5,700kg MTWA and above

Sikorsky S61N	Poole, Dorset	15-Jul-2002	Accident
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AAIB AAR: 2/2004
 FACTOR F21/2004

Synopsis

G-BBHM, which was based at Portland, was being operated in the Search and Rescue role. Following the first alert of the day, G-BBHM had been airborne for about 40 minutes over Poole Harbour when the two rear crew members became aware of an unusual noise. Almost immediately, the pilots saw the 'NO 2 ENG FIRE WARN' light illuminate accompanied by the audio alert. The pilots commenced their emergency procedures, including shutting down the No 2 engine and activating the fire extinguisher, and initially set heading for Bournemouth Airport. However, with the 'FIRE' light still illuminated and indications of hydraulic failures from both tactile and warning systems, the co-pilot alerted the commander to a suitable nearby landing area. The commander called for an immediate landing and made a successful approach and touchdown; during the approach, the pilots became aware that 'NO 1 ENG FIRE WARN' was also illuminated. After touchdown, the pilots shut down No 1 engine and the crew quickly vacated the helicopter. G-BBHM was destroyed by fire shortly after they were clear. The time between the onset of the original fire warning and touchdown was 82 seconds.

The investigation identified the following causal factors:

- 1 The No 2 engine had suffered rapid deterioration of the No 5 (location) bearing of the free turbine, causing failure of the adjacent carbon oil seal and mechanical interference between the Main Drive Shaft Thomas coupling and the Engine Mounting Rear Support Assembly tube, which completely severed the support tube.
- 2 A severe fire, outside of the engine fire zone, was caused because the released engine oil was ignited either by this mechanical interference, or by contact with the hot engine exhaust duct.
- 3 The No 2 engine's No 5 bearing failed because of unusual and excessive cyclic loading conditions arising from shaft vibration. The bearing deterioration was exacerbated by a reduction in its oil supply during the same period, when the live oil jet fractured as a consequence of the vibration.
- 4 It is probable that the Main Drive Shaft vibration was caused by damage or distortion sustained during one or more previous No 2 engine starts involving a high torque rotor engagement.
- 5 There was no specific torque limitation published in the manufacturer's Flight Manual, used by Bristow Helicopters Limited, during rotor engagement after engine start.

SAFETY RECOMMENDATION 2003-083

The aircraft manufacturer, Sikorsky, should relocate the No 1 and No 2 engine bay fire warning lights on the main instrument panel of the S-61N helicopter, with the intention of ensuring as far as possible that unambiguous information is presented to both flight crew members in the event of an engine bay fire.

Response

The FAA have determined that relocating the No 1 engine fire warning light, proposed in this recommendation is not necessary at this time. They state that the fact that the crew did not recognise this warning is not necessary rationale to modify its current location. Complex failure conditions demand prompt and decisive crew response and may detract from the ability to recognise additional failure conditions annunciated during such a period. The FAA consider that the recommendation should be based on a more comprehensive evaluation and should consider existing industry standards for flight deck design in addition to human factor issues.

Status - Rejected - open

SAFETY RECOMMENDATION 2003-084

The FAA, CAA, and engine manufacturer should introduce a modification to the oil jet assembly that, in the event of fracture of the tube which supplies oil to the carbon seal, would prevent a large reduction in supply pressure to the nozzle which supplies oil to the No 5 bearing.

Response

The CAA comments that the accident report states clearly that failure of the oil tube was not the primary cause of the No 5 bearing deterioration.

In view of the report's conclusion, the CAA believes that action focused upon preventing fractures of this oil tube would be preferable and would support any design activity undertaken by the manufacturer and the FAA to this effect.

Status - Rejected - closed

SAFETY RECOMMENDATION 2003-085

The CAA, together with the FAA, airframe and engine manufacturers, should consider the possible value of measuring short term variability in the recorded N_F speed on S-61 helicopter engines, in order to provide early warning of loss of integrity of the drive shaft system, which could lead to failure of the engine mounting rear support assembly tube and subsequent fire.

Response

The FAA states that fluctuations in instrument panel gauges, such as N_F signal, are not sufficiently understood or calibrated against specific failure conditions to warrant their use as primary indicators of the health of the drive train. Since such signal fluctuations are not a sufficiently reliable indicator of a system anomaly, the FAA does not support additional evaluations to explore the use of N_F as a primary indicator of an imminent failure condition. Dedicated systems are already installed that are designed and certified to reliably perform a specified failure detection function. These now include the No.5 bearing chip detector.

The CAA states that the accident report acknowledges that the N_F speed variation increased during the final hour of flight. The CAA however, does not agree that a 'noticeable change could be observed at this time. The report also acknowledges that such speed fluctuations are inherently variable and that, consequently, an early warning by this means may be neither reliable nor adequate.

In addition, the CAA considers that the timely introduction of a practicable warning means has been provided through the action already taken in addressing recommendation 2003-051.

Status - Rejected - open

SAFETY RECOMMENDATION 2003-086

The FAA and CAA should require Flight Manuals for all variants of the S-61 and similar types to include an appropriate torque limitation during rotor engagement.

Response

The CAA accepts this recommendation. In accordance with standard practice the CAA will support the FAA and the manufacturer in introducing appropriate torque limitations to the Flight Manual.

Status - Accepted - closed

SAFETY RECOMMENDATION 2003-087

The FAA and CAA, together with the airframe and engine manufacturers, should investigate the dynamic behaviour of the S-61 MDS and associated high speed rotating components in support of the introduction of an appropriate torque limitation during rotor engagement.

FAA Response

The FAA states that unusually high torque levels experienced during the engine start sequence, but to levels which do not exceed prescribed limitations, have not been proven to cause excessive unbalance conditions that affect the engine transmission drive-train integrity. The FAA comments that this hypothesis needs considerably more engineering evaluation and testing and would need to address the variables that influence dynamic response before concluding that this it is necessary to impose a limitation for airworthiness purposes.

Status - Partially Accepted - open

CAA Response

The CAA states that the results of the analytical MDS dynamic analysis undertaken during the course of this investigation contradict those of comprehensive tests and analyses undertaken previously by the aircraft manufacturer. The results of the manufacturer's work do not support the need for torque limitations to be imposed as a result of any dynamic behaviour of the S-61 MDS.

The manufacturer has accepted that there is a potential for damage to the No. 5 bearing of the engine to occur as a result of high torque during rotor engagement and it is for this reason that appropriate torque limits are being established.

It is considered that the manufacturer's proposed action to introduce engine torque limitations during rotor engagement (Refer to Recommendation 2003-86) within the Flight Manual addresses this Recommendation.

Status - Rejected - closed

SAFETY RECOMMENDATION 2003-088

The CAA, in conjunction with the HUMS systems designers, should require the incorporation into future software versions the capability of providing, automatically, appropriate information about the recorded parameters and the integrity and completeness of the data.

Response

The CAA partially accepts this Recommendation.

Failure fully to acquire HUMS data during a single flight is in itself not a safety concern as the HUMS is intended to identify trends and thereby anticipate those failures that could escalate to a potentially Hazardous condition over a number of flights.

Nevertheless, the CAA recognises the potential for benefits to be realised through more robust HUMS designs that may result from action taken to address this Recommendation. Therefore,

whilst not requiring the implementation of such means in future software at this stage, the CAA will review the need for a capability to provide, automatically, appropriate information about the recorded parameters and the integrity and completeness of the data. This review will be undertaken in conjunction with HUMS designers and operators and will be completed by December 2005.

Status - Partially Accepted - open

SAFETY RECOMMENDATION 2003-090

The CAA, together with HUMS system designers, should incorporate in future HUMS software versions, algorithms which can identify changing signal parameters, other than levels, such as frequency changes and the development of harmonics.

Response

The CAA partially accepts this Recommendation.

The investigation report does not suggest either that the HUMS data or its interpretation was flawed, and contributed in any way to this accident.

The service experience to date indicates that HUMS are approximately 69% effective at detecting incipient failure modes. The CAA considers that with further design enhancements this figure may increase to 80% and beyond. The CAA has therefore invited tenders for the research and development of neural networks and associated algorithms that will contribute towards the achievement of this goal. The results of this research will be used to help inform a decision on the need for algorithms which can identify changing signal parameters, other than levels, such as frequency changes and the development of harmonics.

This research is expected to commence in 2004 and to be completed by July 2006.

CAA Action

The research is now expected to be completed by December 2006.

Status - Partially Accepted - Open

SAFETY RECOMMENDATION 2003-091

It is recommended that the CAA, together with HUMS systems designers, should incorporate in future HUMS requirements, a requirement for a suitable infrastructure to facilitate the comparison of stored HUMS data between aircraft.

Response

The CAA partially accepts this Recommendation.

The investigation report does not suggest either that the HUMS data or its interpretation was flawed, and contributed in any way to this accident.

Nevertheless, the CAA recognises the potential for benefits to be realised through comparison of stored data. The CAA will therefore include this subject within a review undertaken in conjunction with HUMS designers and operators that will be completed by December 2005. The results of this review will be used to help inform a decision on the need for a requirement for an infrastructure to facilitate the comparison of data.

Status - Partially Accepted - open

SAFETY RECOMMENDATION 2003-092

The CAA, in conjunction with HUMS system designers, should consider in future design, the incorporation of modified DAPUs which provide an indication of the completion of the data acquisition cycle.

Response

The CAA accepts this Recommendation.

The investigation report does not identify incomplete HUMS data acquisition as a contributory factor in this accident.

Nevertheless, the CAA recognises the potential for benefits to be realised through more robust HUMS designs that may result from action taken to address this Recommendation. Therefore, the CAA will consider for future designs the incorporation of modified DAPUs that provide an indication of the completion of the data acquisition cycle. This will be included in a review undertaken in conjunction with HUMS designers and operators that will be completed by December 2005.

In the meantime, it has been confirmed that SAR operational procedures are in place that ensure complete in-flight data collection. These procedures include a safeguard to ensure that when a failure to acquire a full data set is detected, an additional "rotors running" data acquisition is required.

Status - Accepted - open (Appropriate Action Implemented/Planned)

AS332L	West Navion Ship, west of Shetland	10-Nov-2001	Accident
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AAIB AAR: 3/2004
FACTOR: F29/2004

Synopsis

The helicopter landed on the helideck of the West Navion drilling ship and was being refuelled with the rotors running. The commander remained on board whilst the co-pilot disembarked and assisted the ship's crew. About five minutes after landing, unknown to the pilot and unnoticed by the ship's crew, the West Navion's Dynamic Positioning (DP) system reverted to MANUAL heading control and the ship's heading started to drift slowly to the right. The wind at that time was westerly at 32 kt with gusts to 42 kt, and, as the ship's heading drifted, the helicopter was subjected to an increasing crosswind component. At 1254 hrs, some seven minutes after the ship's heading started to drift, the helicopter toppled over to its right. The co-pilot, who was the only person outside the helicopter on the helideck, was severely injured by flying debris as the helicopter's main rotors broke up on impact with the helideck. The helicopter came to rest on its right side and the commander vacated, with some difficulty, through the left pilot's door. Mathematical analysis of the forces acting on the helicopter indicated that the most significant toppling moments were caused by aerodynamic forces arising from the increasing lateral wind component to which the aircraft was subjected as the ship yawed to the right.

The investigation identified the following causal factors:

- (i) Unknown to the crew on the bridge, the ship's Dynamic Positioning system reverted to manual heading control and the ship's heading began to drift to the right.
- (ii) The increased lateral wind component to which the helicopter was consequently subjected, generated increasing aerodynamic forces to the right due to the change in the relative wind, and these forces provided the most significant toppling moments of all the forces acting on the helicopter.
- (iii) The 'static' roll attitude of the helicopter adopted after landing, relative to the helideck, of 2.5° to the right, together with the lift force generated by the main rotor in the prevailing wind, the 1° list of the ship to the right at the time of the accident and the natural motion of the ship, contributed to the de-stabilisation of the helicopter.

(iv) The lack of procedures on the ship to transmit the change in the alert status to the crew of the helicopter, and of any specified procedure available to flight crews concerning action to be taken if control of the ship is lost or degraded whilst on the helideck, denied the pilot an appropriate course of action to ensure the safety of the helicopter.

SAFETY RECOMMENDATION 2003-133

It is recommended that the CAA should require Operators conducting offshore operations to publish crosswind limitations for helicopters when operating to, and when positioned on, helidecks, incorporating these limits into their company Operations Manuals.

Response

The CAA accepts this Recommendation.

A FODCOM will be published by 31 August 2004 informing operators conducting offshore operations of the need to publish crosswind limitations for helicopters when operating to, and when positioned on, helidecks, and the incorporation of these limits into their company Operations Manuals.

CAA Action

The CAA has commissioned research into operations on moving decks. This research is still continuing and the issue of defining crosswind limitations is proving to be more complex than originally envisaged. However, following a further incident on a fixed-deck (The Tartan), and in the light of the earlier recommendations, a FODCOM (10/2005) has been published recommending to offshore operators that Ops Manuals include deck handling procedures for operating on decks during adverse weather conditions, including squalls. This FODCOM also includes additional information relating to helicopter roll-over incidents. The FODCOM is interim guidance only and it will be reviewed in April 2006 or sooner if the research programme has been completed before then.

Status - Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2003-134

It is recommended that the CAA require offshore operators to review their landing procedures such that, after landing on moving helidecks, the helicopter's roll attitude, relative to the helideck, is neutral.

Response

The CAA accepts this Recommendation.

A FODCOM will be published by 31 August 2004 requiring operators conducting offshore operations to review their landing procedures such that, after landing on moving helidecks, the helicopter's roll attitude, relative to the helideck, is neutral.

CAA Action

The CAA has commissioned research into operations on moving decks. This research is still continuing and the issue of defining crosswind limitations is proving to be more complex than originally envisaged. However, following a further incident on a fixed-deck (The Tartan), and in the light of the earlier recommendations, a FODCOM (10/2005) has been published recommending to offshore operators that Ops Manuals include deck handling procedures for operating on decks during adverse weather conditions, including squalls. This FODCOM also includes additional information relating to helicopter roll-over incidents. The FODCOM is interim guidance only and it will be reviewed in April 2006 or sooner if the research programme has been completed before then.

Status - Accepted - open (Appropriate Action Implemented/Planned)

Section 6

Rotorcraft above 2,250kg and below 5,700kg MTWA

Sikorsky S76-C Spirit	Cranfield Airfield, Bedfordshire	11-Oct-2003	Accident
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AAIB Bulletin: 5/2004

FACTOR: F27/2004

Synopsis

The helicopter landed heavily from a practice rejected takeoff, following a simulated engine failure, during a short field or semi-oblique take-off profile. The helicopter was not fitted with a Flight Data Recorder (FDR), but data retrieved from the Cockpit Voice Recorder (CVR) was compared with flight test data and this showed a shorter than normal time spent in descent. In addition, both pilots recalled a higher than normal rate of descent and the absence of translational lift. The investigation concluded that the most probable cause of the heavy landing was the high rate of descent, which was in turn due to the absence of translational lift, possibly as a result of the manoeuvre being flown in a slight tailwind.

SAFETY RECOMMENDATION 2004-004

The Civil Aviation Authority require operators of the S76 to carry out an analysis of the risks associated with flying vertical and short field rejected takeoff manoeuvres with a view to mitigating the risks as much as possible.

Response

In the view of the CAA this Recommendation should have been directed at operators of the S76 who fly vertical and short field rejected takeoff manoeuvres. It is the operators who have the responsibility for analysing the risks associated with their operation, and of mitigating these risks as much as possible.

However the CAA will, through a FODCOM to be published by 31 August 2004, recommend that operators of the S76 conducting vertical and short field rejected takeoff manoeuvres carry out an analysis of the risks associated with these manoeuvres with a view to mitigating the risks as much as possible. The FODCOM will be forwarded to relevant corporate operators of the type.

CAA Action

FODCOM 21/2004 was published in October 2004 and distributed to all AOC holders.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-005

The Civil Aviation Authority require Sikorsky to rewrite the S76C+ Rotorcraft Flight Manual to emphasise the potential hazards when flying vertical and short field rejected takeoff in light winds or winds close to the beam.

Response

Since 28 September 2003, responsibility for the matters addressed in this Recommendation has passed to EASA under Regulation (EC) 1592/2002 and the recommendation should be addressed to that Agency.

Under the EASA transition arrangements and as the lead authority for the S76C+ type, the CAA accepts this recommendation on behalf of EASA.

The CAA has written to the manufacturer requiring them to amend Part 2 (Pilot Training Provisions) of the S76C+ Rotorcraft Flight Manual to emphasise the potential hazards when flying vertical and short field rejected takeoff in light or variable winds or winds close to the beam.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-006

The Civil Aviation Authority require Sikorsky to rewrite the S76C+ Rotorcraft Flight Manual to make the required handling techniques for the rejected takeoff from the short field or semi-oblique take-off profile clearer.

Response

Since 28 September 2003, responsibility for the matters addressed in this Recommendation has passed to EASA under Regulation (EC) 1592/2002 and the recommendation should be addressed to that Agency.

Under the EASA transition arrangements and as the lead authority for the S76C+ type, the CAA accepts this recommendation on behalf of EASA.

The CAA has written to the manufacturer requiring them to rewrite the S-76C+ Rotorcraft Flight Manual to make the required handling techniques for the rejected takeoff from the short field or semi-oblique profile clearer.

Status - Accepted - closed

Sikorsky S76	Near the Leman 49/26 Foxtrot Platform, North Sea	16-Jul-2002	Accident
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AAIB AAR: 1/2005
FACTOR: F8/2005

Synopsis

The aircraft operator's base at Norwich operates S-76 helicopters in support of offshore oil and gas operations in the southern North Sea. On the evening of the accident the aircraft departed Norwich to complete a scheduled flight consisting of six sectors in the southern North Sea offshore gas fields. The first four sectors were completed without incident but whilst en-route between the Clipper, an offshore production platform, and the Global Santa Fe Monarch, a drilling rig, the aircraft suffered a catastrophic structural failure. The helicopter's main rotor assembly separated almost immediately and the fuselage fell to the surface about 0.8nm north-west of the Global Santa Fe Monarch which at the time was attached to the Leman 49/26 Foxtrot platform, a normally unmanned installation. Witnesses reported hearing a single or double muffled bang or boom, and seeing the aircraft fall into the sea. The fuselage disintegrated on impact and the majority of the structure sank. Fast rescue craft launched from the Putford Achilles, a multipurpose standby vessel, arrived at the scene of the accident within a few minutes. There were no survivors amongst the nine passengers and two crew.

SAFETY RECOMMENDATION 2004-037

The Sikorsky Aircraft Company should, within Repair Procedure No 6, clearly specify a durable transparent patch material for covering cracks in the leading edge erosion covers of S-76 main rotor blades.

Response

The S-76 Composites Maintenance Manual (CMM) now specifies only 3M transparent polyurethane tape for all leading edge erosion cover repairs. This is the best material available. Sikorsky continually evaluates new products for this application, and updates the manuals as appropriate. The FAA has approved this manual and has found no shortcoming.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-038

The Sikorsky Aircraft Corporation should ensure that new cracks in the leading edge erosion covers of S-76 main rotor blades are frequently monitored for growth by an appropriately qualified person and for a suitable period to ensure that the crack is not symptomatic of a deeper flaw within the blade.

Response

Sikorsky does not concur with this recommendation. Sheath cracks are an independent phenomena and are not symptomatic of a deeper flaw, ie a crack in the spar, within the blade structure. In more than 15 million blade flight hours, other than the July 16, 2002 blade fracture, which was the result of the confluence of two highly improbable external factors (a sheath anomaly and a lightning strike), there has never been an in-service failure of an S-76 main rotor blade.

Status - Rejected - open

SAFETY RECOMMENDATION 2004-039

The Sikorsky Aircraft Corporation should amend the S-76 Pre-Flight Check and 50-Hour Inspection procedures to include a search for cracks in the upper and lower skins of main rotor blades. The procedures should prompt investigation of the underlying reason(s) for such cracks before the next flight.

Response

Sikorsky will amend the 50 hour inspection procedure to include a search for chordwise skin cracks. The existing FAA approved pre-flight checklist is sufficient.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-040

It was recommended to the European Aviation Safety Agency and to the US Federal Aviation Administration that their Airworthiness Requirements for helicopters should ensure that any future design of main rotor blade that incorporates a hollow metal spar should be designed from the outset to incorporate an automatic onboard crack detection system covering spar areas which cannot readily be inspected and are not damage tolerant.

Response

EASA will determine any need to amend the Large Rotorcraft Certification Specification CS-29 as proposed. The Agency will conduct a pre-regulatory impact assessment in order to prepare for such activities.

The FAA have evaluated the subject safety recommendation that the FAA Rotorcraft Airworthiness Requirements should include requirements for an automatic onboard crack detection system covering spar areas that cannot readily be inspected and are not damage tolerant. This recommendation is a result of an accident involving a Sikorsky S-76A helicopter, type certified November 21, 1978, and approved for Category A January 9, 1979.

The current regulatory requirements, amended October 7, 1989, does address the fatigue issues for rotorcraft fatigue critical components, such as the rotor blades, as well as those

components that cannot readily be inspected and are not damage tolerant. These design requirements preclude the need for an automatic onboard detection system.

The FAA are involved in future rulemaking activities that will further enhance safety of rotorcraft fatigue critical components. However, the FAA believes the current requirements adequately address this safety recommendation.

Status - Partially Accepted - open

SAFETY RECOMMENDATION 2004-041

The UK Offshore Operators Association should amend its guidelines to include a responsibility on offshore installation operators to ensure that, for all flights between manned offshore installations, radio operators of such installations establish positive contact with the destination installation immediately after the departure of a helicopter and convey the relevant flight details such as persons on board and estimated time of arrival.

Response

UKOOA acknowledged the specific recommendation 2004-41 directed at the UK Offshore Operators Association and confirmed that they have amended the Guidelines for the Management of Offshore Helideck Operations to take account of this recommendation. The Preface to the guidelines, which will be published as Issue No 5 2005 in March 2005, and will be distributed to all Offshore Operators.

Status - Accepted - closed

Bolkow BO 105-DBS-4	Brough of Birsay, Orkneys	24-May-2002	Accident
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AAIB Bulletin: 8/2003
FACTOR: 8/2003

Synopsis

The helicopter was carrying out external load lifting operations from the Brough of Birsay island lighthouse off the north-west coast of the Island of Orkney to a site some two miles away on the main island. The pilot was very experienced in carrying out external load lifting and had transported a number of loads that morning without incident. On the accident flight the load was seen to become unstable and contact the tail rotor resulting in total loss of tail rotor thrust. The helicopter was seen to descend rapidly in a spiral to the right and impact the sea. The pilot was fatally injured during the impact and the helicopter sank almost immediately. Recommendations are made concerning the guidance available to load constructors and enhancing a pilot's chances of surviving a tail rotor strike.

SAFETY RECOMMENDATION 2003-037

In consultation with the helicopter industry, the Civil Aviation Authority should produce guidance for the preparation, construction and carriage of external loads. This guidance should include methods of improving the stability of loads that have poor or unpredictable flight characteristics.

Response

The Civil Aviation Authority accepts this Recommendation.

The CAA, in consultation with the helicopter industry, will produce guidance for the preparation, construction and carriage of external loads and include methods of improving the stability of loads that have poor or unpredictable flight characteristics.

The subject was discussed at the inaugural meeting of the CAA/British Helicopter Advisory Board (BHAB) Onshore Liaison Committee meeting on 12 June 2003. The BHAB has agreed to draft guidelines on best practice for the preparation, construction and carriage of external loads. When agreed and accepted, this guide will form the basis of a revised CAA publication, CAP 426 (Helicopter Underslung Load Operations). It is expected that this revision to CAP 426 will be completed during 2004.

CAA Action

The Civil Aviation Authority has consulted with the helicopter industry and draft guidelines on best practice for the preparation, construction and carriage of external loads have been agreed and accepted. These have now been incorporated into a comprehensive amendment of CAP 426 (Helicopter Underslung Load Operations). This amendment is due for publication before 31 May 2005.

Status - Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2003-038

The Civil Aviation Authority should take forward a proposal to the appropriate helicopter manufacturers and type certification bodies that the flight characteristics of a helicopter following the loss of tail rotor effectiveness should be promulgated in every helicopter type's Flight Manual.

Response

The CAA accepts this Recommendation.

In view of the imminent transfer of type certificate responsibility in European Union States from national aviation authorities to the European Aviation Safety Agency (EASA), the CAA will, by 31 March 2004, propose to EASA that it amend its standards to require helicopter manufacturers to promulgate, in every helicopter type's Flight Manual, the flight characteristics of the helicopter following the loss of tail rotor effectiveness.

CAA Action

The CAA has published Paper 2003/1 Helicopter Tail Rotor Failures, which is a comprehensive review of the title subject. The paper makes a number of recommendations for actions aimed at minimising the probability of tail rotor failure events and mitigating their effects on the continued safe conduct of flight should one actually occur. This includes enhancements to the Certification Specifications and a recommendation that manufacturers should be required to analyse the effects of tail rotor failures on their products. Where the effects are significant it is recommended that either advice on how to cope with a Tail Rotor Failure (TRF) should be provided or if such advice is not available then advisory operational restrictions should be applied.

The EASA which, since September 2003, is responsible for both type certification and rulemaking in Europe has been requested to receive the paper from the CAA UK at the next Advisory Group National Authorities (AGNA) meeting on 21 June 2005. The EASA will be requested to consider adopting the recommendations of the paper into its certification and rulemaking activities. Additionally the paper has been made available on the CAA website and will be circulated to helicopter manufacturers worldwide by June 2005.

Status - Accepted - open (Appropriate Action Implemented/Planned)

Section 7

Rotorcraft 2,250kg MTWA and below

Hughes 369-HS	Knockholt, Sevenoaks, Kent	19-Jul-2003	Accident
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AAIB Publications: 1/2005

FACTOR: F2/2005

Synopsis

The helicopter was seen to depart normally in good weather conditions. Shortly after takeoff, as the pilot acknowledged a frequency change instruction, the helicopter was seen to enter a descending left turn from which it did not recover. Eyewitnesses reported seeing the helicopter 'fishtailing' and emitting unusual noises, cyclical in nature, which they thought consistent with changes in engine power. The pilot made one more RTF transmission just before ground impact but this message did not declare the nature of any problem. The machine struck the ground in a 30 degrees nose-down pitch attitude at about 80 kt forward speed, severely disrupting the structure and imparting fatal injuries to the family on board. There was no evidence of any pre-impact technical failure and the engine was running at impact. The reasons for the accident could not be determined. However, information recovered from a Cockpit Voice Recorder (CVR) or Flight Data Recorder (FDR) could have enabled the investigators to determine the likely cause but there was no requirement for either on this rented public-transport category helicopter and none was fitted.

SAFETY RECOMMENDATION 2004-084

The Department for Transport should urge the International Civil Aviation Organisation (ICAO) to promote the safety benefits of fitting, as a minimum, cockpit voice recording equipment to all aircraft operating with a Certificate of Airworthiness in the Commercial Air Transport category, regardless of weight or age.

SAFETY RECOMMENDATION 2004-085

The Department for Transport should urge the International Civil Aviation Organisation (ICAO) to promote research into the design and development of inexpensive, lightweight, airborne flight data and voice recording equipment.

Response

The Department for Transport fully support these two safety recommendations and have urged ICAO to take steps to promote the safety benefits of fitting cockpit voice recording equipment to all aircraft with a Certificate of Airworthiness in the Commercial Air Transport category and to promote research into the design of inexpensive lightweight flight data and voice recording equipment.

ICAO will refer discussion on this topic to FLIRECP when convened.

Status - Accepted - closed

**Ponsford Bensen
B8MR (Modified)****Shipdham Airfield,
Norfolk****29-Jun-2003****Accident****AAIB Bulletin: 9/2004
FACTOR: F31/2004**

Synopsis

The accident occurred on the first unsupervised flight following the pilot's completion of his Private Pilot's Licence (Gyroplanes) course. It resulted from the rotor blades striking the rudder, which rendered the gyroplane uncontrollable. Witness accounts indicated that G-BIGU was flying straight and level at a reasonable speed just before the event, although there were reports of possible 'over-controlling' during the flight.

The specific reason for the rotor blades striking the rudder could not be determined but a pilot induced oscillation appeared to be the probable cause. An examination of the aircraft, and subsequent computer modelling by the University of Glasgow indicated that the aircraft could have had poor longitudinal stability characteristics. The investigation also highlighted the poor safety record of gyroplanes in general compared to other types of recreational aircraft. Accordingly, recommendations have been made concerning the approval of gyroplanes and the training and licensing of gyroplane pilots.

SAFETY RECOMMENDATION 2004-042

The Civil Aviation Authority should differentiate between wheel balancing and airborne exercises when detailing the flying hours required for the issue of a Private Pilot's Licence (Gyroplanes).

Response

The CAA will make the necessary amendments to the Private Pilot's Licence (Gyroplanes) requirements in the LASORS (Licensing, Administration, Standardisation, Operating Requirements and Procedures) publication in time for the next re-print, which is scheduled for January 2005.

CAA Action

The necessary amendments have been incorporated into the LASORS publication (Section C3-10).

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-043

The Civil Aviation Authority should review the present gyroplane training requirements with the aim of establishing a minimum number of supervised flying hours, discounting wheel balancing, when undertaking differences training on gyroplanes.

Response

Following a review of the present gyroplane training requirements, the CAA will introduce a specified minimum number of supervised flying hours, discounting wheel balancing, for differences training on gyroplanes. The necessary amendments to the Private Pilot's Licence (Gyroplanes) requirements in the LASORS (Licensing, Administration, Standardisation, Operating Requirements and Procedures) publication will be made in time for the next re-print, which is scheduled for January 2005. In the meantime all Gyroplane Flying Instructors will be instructed, by letter, to implement the change to flight training with immediate effect.

CAA Action

The necessary amendments have been incorporated into the LASORS publication (Section C3-10).

Status - Accepted - closed**SAFETY RECOMMENDATION 2004-044**

It is recommended that the Civil Aviation Authority in conjunction with the Popular Flying Association (PFA) ensures that test pilots evaluating the handling qualities of gyroplanes against British Civil Airworthiness Regulations Section 'T' are appropriately trained to make such evaluations.

Response

The CAA is working with the PFA to define a process which ensures that test pilots evaluating the handling qualities of gyroplanes against BCAR Section T requirements are appropriately trained to make such an evaluation. This work will be completed by end 2004.

CAA Action

CAA, in conjunction with PFA, has defined and implemented a process which requires CAA to review all applications for modification of Gyroplanes to agree those projects that can be delegated. All delegated projects that involve handling assessments require CAA agreement of the proposed Flight Test Schedule, the Test Pilots to be used and any instruction/training to be given by the CAA Flight Department. The Flight Test results are presented to and reviewed by CAA before acceptance and approval.

Status - Accepted - closed**SAFETY RECOMMENDATION 2004-045**

It is recommended that the Popular Flying Association (PFA) in conjunction with the Civil Aviation Authority revises the format of the PFA Gyroplane Flight Test Schedule such that a completed form contains all the data required by British Civil Airworthiness Regulations Section 'T'.

Response

The CAA is working with the PFA to define a process which ensures gyroplane flight test schedules include fields for recording all the data required by BCAR Section T. This work will be completed by end 2004.

CAA Action

PFA Flight Test Schedules previously used to assess design investigations against BCAR Section T are no longer in use. Revised Flight Test schedules for those Gyroplanes with modifications being assessed against BCAR Section T now include fields for recording all the data required by BCAR Section T.

The CAA is working with the PFA to define a process which ensures gyroplane flight test schedules include fields for recording all the data required by BCAR Section T. This work will be completed by end 2004.

Status - Accepted closed

Bell 206-L	Longfaugh Farm, near Pathhead, Midlothian	30-Apr-2003	Accident
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AAIB Bulletin: 3/2004
FACTOR: 3/2004

Synopsis

Towards the end of a flight, the pilot had transited through Edinburgh Airport Zone in preparation for a landing at his home site of Oxenfoord Castle, north of Pathhead. When to the east of Edinburgh, he deviated to the south to avoid some low cloud but, as he started heading east towards his intended landing area, the pilot encountered further low cloud at the beginning of a valley. He descended to remain in sight of the ground and almost immediately saw pylon cables directly ahead of the helicopter. He initiated a climb but the rear of the helicopter struck a cable and the tail rotor/fin assembly detached. G-IANG force landed heavily on the upslope of a grass field. The helicopter was extensively damaged but the three occupants escaped with minor injuries. The pilot's shoulder harness failed during the forced landing.

SAFETY RECOMMENDATION 2004-012

The CAA should re-emphasise to the aeronautical community in general, and licensed engineers in particular, the importance of ensuring that any occupant restraint systems already fitted, or to be replaced, on an aircraft or helicopter, comply with the relevant airworthiness requirements.

Response

The CAA will re-emphasise to the aviation industry, including licensed aircraft engineers, the importance of ensuring that any occupant restraint system already fitted, or to be replaced, on an aircraft or helicopter, complies with the relevant airworthiness requirements. A Flight Operations Department Communication (FODCOM) and a GASIL article will be published in June 2004.

CAA Action

FODCOM 13/2004 was published in July 2004 and distributed to all AOC holders. In addition an article on this subject was published in GASIL in June 2004.

Status - Accepted - closed

RAF 2000	Hall Farm Strip, near Lichfield	05-Feb-2003	Accident
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AAIB Bulletin: 2/2004
FACTOR: F13/2004

Synopsis

The aircraft, built from a kit by its previous owner, had suffered at least one roll over accident and the rotor blades had been replaced twice before it was sold to the pilot. He fitted new parts including further new rotor blades and the aircraft subsequently completed about 60 hours of flying without incident.

Not long before the accident flight, chord-wise cracks had been found in both of the composite main rotor blades and the aircraft had been grounded. The AAIB commissioned a detailed material examination of the cracks as they were thought to be related to a fatal accident involving another RAF 2000. The examination indicated that the cracks, that were not relevant to the earlier fatal accident, were a result of 'lay-up' issues which were subsequently taken up by the CAA with the kit manufacturer.

A further set of new blades for G-BWAE were received from the manufacturer, and these were fitted. A new, taller teeter block was also obtained. While attempting to fit this however, some damage was found to bolts in the assembly. This was considered to have been damage undetected after the roll over accident and consequently a complete new gimbal head was procured. Much effort was expended carefully aligning the new rotor hub bar and gimbal head, in order to achieve low vibration levels. Ultimately the gimbal head was successfully fitted to the aircraft and signed off by a PFA inspector who was also a gyroplane instructor.

The aircraft was inspected on the morning of the accident and issued with a flight release note by the PFA inspector. The inspector then carried out two solo flights, in calm wind conditions, during which the aircraft performed well with no undue vibration. The third flight was flown dual with the inspector being accompanied by the owner.

A handling check, carried out after a normal takeoff and climb to 1,500 feet, showed no problems and the flight was continued as a circuit training detail at a local microlight airfield. The aircraft landed back on its home grass strip without incident 1 hour and 15 minutes later. The aircraft was then refuelled and prepared for a further flight.

After the usual checks, including control checks, the aircraft was positioned for takeoff, the pre-rotator engaged and the takeoff commenced. The aircraft lifted into a level attitude and the owner, who was handling, gently eased the stick forward to increase airspeed. As expected the aircraft maintained a level attitude as the speed increased until, at an estimated height of approximately 10 feet, it developed a marked nose down attitude and rolled slightly right. The instructor felt the pilot compensate but considered, from the attitude of the aircraft, that he had not been positive enough with the controls, and so pulled firmly and fully aft. The aircraft did not respond and hit the ground hard breaking off the nose gear and coming to rest upright with the engine still running. The aircraft was shut down and the occupants vacated the cockpit without injury. The pilot and instructor both felt that there had been no response to the controls, and that the stick had moved without the usual resistance from normal control forces.

SAFETY RECOMMENDATION 2003-130

It is recommended that the CAA and PFA ensure that the 'eye end' fittings of the RAF 2000 rotor head control rods are manufactured from material of a suitable specification to prevent failure during operation within the certified flight envelope.

Response

The CAA accepts this Recommendation.

The CAA will establish whether the eye end fittings of the RAF 2000 rotor head control rods are manufactured from material of a suitable specification to prevent failure during operation within the certified flight envelope. The CAA is currently discussing this with the Manufacturer and anticipates the necessary structural analysis will be concluded by June 2004.

CAA Action

The process of showing compliance with the design requirements of BCAR Section T ensures the suitability of the material specification of the eye end fittings of the RAF 2000 by requiring demonstration of reserved factors appropriate to the chosen material. The manufacturer's design data and a PFA assessment of the RAF 2000 rotor head control rod eye ends has identified that, with the exception of the bottom control rod situated between the front and rear control arms, reserve factors for the eye ends are adequate. CAA will, by July 2005, issue an MPD, to mandate a PFA modification, (Bulletin MOD/G-13/001 refers) for this bottom pitch control push rod that replaces the aluminium tube with a stainless steel pitch control rod also

incorporating strengthened rod ends. This modification will ensure compliance with BCAR Section T.

Status - Accepted - closed

Bell 206B JetRanger III	Cudham, Kent	17-Jan-2003	Accident
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**AAIB Bulletin: 12/2003
FACTOR F4/2004**

Synopsis

The pilot, a part-time flying instructor, planned to collect the helicopter from Biggin Hill Airport, Kent and fly it to Southend, Essex. The weather for the departure from Biggin Hill was generally poor with low cloud and reduced visibility in rain. The pilot's stated intention was to depart to the north-east, but after initially departing on an easterly track the helicopter turned toward the south. Witnesses in an area about one and a half miles east-south-east of Biggin Hill saw the helicopter disappear from view into cloud and later reappear in a steep descent and strike the ground. Both occupants were killed on impact. An engineering examination of the helicopter revealed no defects that could have caused the accident. The investigation concluded that the accident was probably a result of the pilot's spatial disorientation brought on by inadvertent entry into cloud.

SAFETY RECOMMENDATION 2003-110

It is recommended that, the CAA place visibility, and consider placing cloudbase, minima on VFR helicopter cross country flights to be undertaken by PPL (Helicopter) holders.

Response

The CAA accepts this Recommendation.

The CAA will take action to require flights by UK PPL (Helicopter) Licence holders to be conducted in conditions not less than specified minimum visibilities unless the licence holder has an instrument rating. The CAA will table the subject for consideration by the Small Helicopter Action Group, a joint CAA/Industry working group, at its meeting on 22 January 2004.

CAA Action

The Small Helicopter Working Group (SHWG) (previously known as the Small Helicopter Action Group), at its meeting on 22 January 2004, agreed that the CAA should take action to amend Schedule 8 of the Air Navigation Order 2000 to introduce requirements that holders of UK PPL (Helicopters), PPL (Gyroplanes) and JAR FCL PPL (Helicopters) will require a visibility of at least 3 km for a cross-country flight and 10 km for a special VFR flight in a control zone. Also, holders of all helicopter licences that do not include an instrument rating will be prohibited from undertaking a flight out of sight of the surface. A letter of consultation was issued by GAD on 25 February 2005, with a comment period until 27 May 2005.

Status - Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2003-111

It is recommended that, the CAA take action to amend the ANO to forbid flying in IMC on IFR flights in Class D, E, F or G airspace by UK PPL (Helicopters) holders unless they hold an instrument rating.

Response

The CAA partially accepts this Recommendation.

The CAA will not take action to amend the ANO. However, the CAA will take action to require flights by UK PPL (Helicopter) Licence holders to be conducted in conditions not less than specified minimum visibilities unless the licence holder has an instrument rating. The CAA will table the subject for consideration by the Small Helicopter Action Group, a joint CAA/Industry working group, at its meeting on 22 January 2004.

CAA Action

The Small Helicopter Working Group (SHWG) (previously known as the Small Helicopter Action Group), at its meeting on 22 January 2004, agreed that the CAA should take action to amend Schedule 8 of the Air Navigation Order 2000 to introduce requirements that holders of UK PPL (Helicopters), PPL (Gyroplanes) and JAR FCL PPL (Helicopters) will require a visibility of at least 3 km for a cross-country flight and 10 km for a special VFR flight in a control zone. Also, holders of all helicopter licences that do not include an instrument rating will be prohibited from undertaking a flight out of sight of the surface. A letter of consultation was issued by GAD on 25 February 2005, with a comment period until 27 May 2005.

Status - Partially Accepted - open

RAF 2000 GTX-SE	Black Notley, Essex	17-May-2002	Accident
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AAIB Bulletin: 9/2003

FACTOR: F34/2003

Synopsis

On the afternoon of the accident the pilot and his colleague had arranged to go for a flight together in G-BYDW. They took off in the middle of the afternoon from the farm strip at Rayne and spent about twenty minutes flying in the local area. The pilot then took his colleague's wife for a short flight, again in G-BYDW. On their return it was agreed that the pilot would fly once more with his colleague, but this time in his colleague's machine, G-CBAG. The pilot then went on to conduct some solo circuits in G-BYDW, whilst his friend got G-CBAG out of the hangar and completed a pre-flight check and engine warm up.

After landing from his solo flight the pilot put G-BYDW away before getting into the right hand seat of G-CBAG. His unqualified colleague occupied the left-hand seat, which on the RAF 2000 is usually occupied by the pilot flying the aircraft as the blade pre-rotator required during takeoff is only operable from this seat. They then taxied out and took off, flying back over the airfield before heading off in a southerly direction. A witness at the airfield later estimated the departure time as 1600 hrs. Witnesses reported seeing or hearing nothing unusual.

The weather that afternoon was described by witnesses as bright and sunny. Some described the wind as calm, but others estimated that there was a north-easterly wind of between 10-15 kt. One witness commented that whilst it had been generally calm, there had also been some gusts of wind. An aftercast from the Met Office indicated that there was a moderate south-easterly flow covering the area at the time of the accident, with winds up to 1,000 feet being generally easterly at 13 to 20 kt. Stansted Airport, 12 nm to the west of the accident site, had fine weather and an easterly wind of about 12 kt and Andrewsfield, located 4 nm to the north-west, also had an easterly wind of about 13 kt. No gusts were recorded in these reports. However, by convention, no gusts below 10 kt are required to be reported. Hence it is possible that, at times, the wind speed could have been gusting to just over 20 kt.

Several witnesses in the local area reported seeing a gyroplane at various times that afternoon. Most of these sightings were at the time when the pilot was flying G-BYDW. However, there were also some witnesses to the accident itself. These all reported seeing G-CBAG suddenly fall vertically to the ground, shedding parts as it fell, with some able to identify one of the rotors separating.

The aircraft seemed to have been flying normally up to this point, although one witness reported seeing the gyroplane lose height both shortly before and then again immediately before it started to fall. Descriptions of the height at which G-CBAG was flying varied, but it was probably between 500 and 1,000 feet.

There were also varying eyewitness descriptions about the engine noise. Whilst all agreed there had been engine noise up to the point where the aircraft had dropped, there were differences in the point at which witnesses heard the noise cut out. Some reported this to be when the gyroplane had started to fall, some reported it cutting out during the fall and others reported that the engine could be heard until the aircraft hit the ground.

On seeing the crash witnesses close by notified the emergency services and made their way to the accident site to offer what assistance they could. The emergency services were quickly at the scene. Both occupants sustained fatal injuries on impact.

SAFETY RECOMMENDATION 2003-001

It is recommended that the CAA should review the pitch stability requirements of BCAR Section 'T' in the light of current research, and amend the Requirement as necessary. The CAA should consider the need for an independent qualified pilot assessment of the handling qualities of different gyroplane types currently approved for the issue of a Permit to Fly against the standards of BCAR Section T, as amended.

Response

The CAA accepts this Recommendation.

The CAA will review the pitch stability requirements of BCAR Section T in the light of current research and introduce amendments, where found to be appropriate. This review will be completed by 31 November 2003.

The CAA will, by 31 December 2003, also consider the need for an independent qualified pilot assessment of the handling qualities of different gyroplane types currently approved for the issue of a Permit to Fly against the standards of BCAR Section T, as amended.

CAA Action

The CAA reviewed the static and dynamic pitch stability requirements in the course of a general review of BCAR Section T prior to 31 November 2003. Under European Directive 98/34/EC, National Airworthiness Authorities are required to gain agreement by the European Commission, prior to national requirements being published. The CAA has received agreement for the publication of the amendment to BCAR Section T, which will be published in July 2005.

The CAA considered the need for an independent test pilot prior to 31 December 2003 and has engaged the services of an experienced autogyro pilot to conduct independent assessments of gyroplane flying characteristics against the standards of BCAR Section T after its amendment.

Status - Accepted - open (Appropriate Action Implemented/Planned)

SAFETY RECOMMENDATION 2003-003

It is recommended that the CAA should assess the RAF 2000 for compliance with the requirements of BCAR Section 'T', as amended, and, if necessary, require appropriate modification to achieve compliance.

Response

The CAA accepts this Recommendation.

The CAA will, within one year of the completion of amendments to BCAR Section T, assess the RAF 2000 for compliance with the requirements of BCAR Section 'T', as amended, and, if necessary, require appropriate modification to achieve compliance.

CAA Action

Under European Directive 98/34/EC, National Airworthiness Authorities are required to gain agreement by the European Commission, prior to national requirements being published. The CAA has received agreement for the publication of the amendment to BCAR Section T, which will be published in July 2005. The assessment of the RAF 2000 for compliance with the requirements of BCAR Section 'T', as amended, will follow thereafter.

Status - Accepted - open (Appropriate Action Implemented/Planned)

Hughes 269C	Hare Hatch, Berkshire	08-Mar-2000	Accident
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AAIB AAR: 1/2003

FACTOR: F3/2003

Synopsis

On the day of the accident the owner, who was an instructor and type-rating examiner, had intended to use the helicopter for recurrent training and testing of a private pilot, but the wind conditions were unsuitable. The helicopter was therefore released to the owner's son and his friend for their use.

During the morning the helicopter had been refuelled at Shoreham Airport and had then flown to a private landing site nearby. At around 1500 hrs, the two pilots and a mutual female friend had boarded the helicopter to fly to Wycombe Air Park. The mutual friend occupied the centre seat position. Before the centre seat can be occupied, the right seat occupant's collective lever must be removed and the gap between the seats bridged with a purpose-designed cushion. The helicopter manufacturer provided a lap belt for the centre seat occupant, whereas the other two 'permanent' seats were equipped with lap and shoulder straps. The flight to Wycombe Air Park was apparently uneventful.

During the time that the helicopter was shut down at Wycombe Air Park, the female passenger had remained onboard while one pilot had collected some ground handling wheels and the other had paid the landing fee, 'booked in and out', and attended to some private business. Before the helicopter took off, a member of staff at a training centre had taken a digital photograph of the friend who had just completed his helicopter instructor's course. The picture showed the friend standing at the left side of the helicopter, with his back to the tailboom attachment area. After the photograph was taken, the friend had ducked under the tailboom and had gone to the right hand door, which led to the seat without a collective lever.

Nobody recalled seeing the two pilots boarding the helicopter and only two people saw it take off; they reported nothing abnormal. At 1631:40 hrs, one of the pilots transmitted that he was changing to an en-route frequency; this was the last RT message recorded from the helicopter on any of the likely frequencies. However, a minute later the helicopter's transponder was interrogated by radar at Heathrow and the data was recorded. The data did not include height encoding, but after making due allowance for the likely wind it enabled an accurate reconstruction of the helicopter's track which ceased some two minutes later, a few metres from the crash site.

The helicopter was tracking over the town of Wargrave on a southerly heading at about 65kt indicated airspeed (IAS) when witnesses on the south side of the town first noticed it. Their attention was drawn to the helicopter because it was quite low and the sound of its engine changed as it progressed towards the village of Hare Hatch. They reported that the engine note changed from a steady noise to a 'spluttering sound'. Other witnesses in the vicinity of Hare Hatch also heard an unusual engine note, but most saw the helicopter either coming towards them or going away from them.

Only two witnesses had an appreciable side view of the helicopter. They were standing in a garden and saw it flying at a steady height and speed, but the engine note sounded 'course'. Suddenly the helicopter broke into two sections with an audible 'pop' sound. They thought the cockpit section broke away from the combined engine and tailboom assembly, amidst a short-lived but large ball of dark coloured smoke; the main rotor blades then folded downwards and stopped. The witnesses saw smaller parts detach from the two main sections as they fell, in a manner similar to a ballistic trajectory. One witness reported seeing one of the occupants 'jump out' of the helicopter.

This person's body, that of the female passenger, was found some 50 metres from the main wreckage and to the north of the cockpit section's trajectory.

CAA Summary

Aviation safety regulations and requirements, in conjunction with manufacturer's published recommendations, establish the sound basis that contributes to the continued safe operation of aircraft. This includes the requirements and standards for maintenance, including repair and inspection, so that aircraft remain in an airworthy condition. It is therefore essential that those who have legal obligations and authority to certify that an aircraft is fit to fly ensure that manufacturer's and regulatory continued airworthiness requirements are fully complied with. Deviation from these standards will directly affect the safe operation of the aircraft.

The CAA, consistent with its ongoing safety improvement process and, recognising the events that may have contributed to the accident involving G-ZAPS, carried out a detailed review of its procedures, working practices, the training of technical staff and the Technical Procedures they are required to follow. The review concluded that CAA's continued airworthiness requirements and standards continue to be relevant and valid. Additionally, the Safety Regulation Group in its 2002 / 2003 Business Plan included a review designed to provide greater focus on industry's management of airworthiness directives and other mandatory requirements. This review culminated with the CAA publishing additional best practice advice to industry, the briefing of its Surveyors, further enhancements to its aircraft survey programme and, in 2003, the delivery of Continued Airworthiness industry seminars to promote applicable requirements and standards.

The CAA, having carried out a comprehensive review of this report into the accident involving Hughes 269C G-ZAPS, has concluded that it does not provide the clarity or credence to the different roles, interfaces and responsibilities of those involved. These include the Licensed Aircraft Engineer, the CAA approved welder, the aircraft commander on the day of the accident and the CAA. The report challenges the long established continued airworthiness assurance process prevailing in the UK that fully conforms to international standards and which has positively contributed to the UK aviation safety record that is amongst the best in the world.

The CAA therefore responds to the report's safety recommendations as follows:

SAFETY RECOMMENDATION 2001-082

The CAA should take early action to introduce a requirement that Welding Certificates of Conformity must state details of the applicable aircraft registration, type, component/part number, serial number and approval for the related weld repair.

Response

The CAA partially accepts this Recommendation.

The CAA approves welders who have demonstrated competence to carry out particular weld techniques. They are not required to have knowledge of an aircraft type or components on which they are carrying out a weld repair. Their involvement is restricted to the accomplishment

of a weld or series of welds in accordance with approved technical data. The responsibility for ensuring a repair scheme conforms to approved technical data rests with the LAE who will certify the work done.

Both Airworthiness Notice No. 3 and BCAR Chapters A6-2 and A6-7 require a summary of the work carried out, including a reference to any associated repair schemes or approved drawings, to be recorded in the legally required aircraft records.

The Welding Certificate of Conformity is not a required document. Where the work is carried out on an aircraft, the details of a welding repair will be added to the maintenance work sheets already in use. Alternatively, a welder or an organisation, at a facility remote from the aircraft, may carry out work on a component or part. The responsible welder or organisation will then supply an appropriate record of the work carried out which includes the details of the component, part number and serial number. The aircraft registration may not be appropriate, since the component or part may be returned after repair and fitted to another aircraft.

The LAE accepting the repaired component or part, prior to fitting to an aircraft, is responsible for ensuring that the weld repair carried out has been done to approved technical data and that the details of the repair are sufficient to meet the requirement for appropriate records to be satisfied. Although this is considered to be implicit in paragraph 1.5 of Airworthiness Notice No. 3 this will be reviewed.

CAA Action

AN3 was published on 28/09/2004.

Status - Partially Accepted - closed

Section 8

Others

Puchacz Glider	Near Husbands Bosworth, Leicestershire	18-Jan-2004	Accident
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AAIB Bulletin: 1/2005
FACTOR: F3/2005

Synopsis

The flight, with an instructor and student on-board, was planned from Husbands Bosworth. Although no-one overheard the pre-flight briefing, it is likely that the primary aim of the flight was spinning training. Witnesses saw the aircraft enter a spin at around 1,500 feet agl and continue in a normal, steeply nose-down, spin with no significant change in the flight path before it impacted the ground. A number of likely explanations for the accident were considered but no conclusive evidence was found. The investigation was unable to dismiss the possibility of pilot incapacitation or of a control restriction/malfunction, and so five Safety Recommendations are made.

SAFETY RECOMMENDATION 2004-065

It is recommended that the British Gliding Association require all Gliding Clubs to ensure that instructors and pilots establish and brief students on, minimum entry heights, minimum recovery initiation heights and minimum recovery heights, whenever intentional spinning is planned. These heights should take into account the characteristics of the glider type being flown, the experience and ability of the crew, and the possible need to abandon the glider.

Response

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-066

The Civil Aviation Authority should review the National Private Pilot's Licence medical standards to confirm that the combination of the Driver and Vehicle Licensing Agency (DVLA) Scheme and National Private Pilot's Licence Information Sheets adequately address the risk of medically induced distraction or incapacitation for instructors and pilots authorised to carry passengers.

Response

The CAA accepts this recommendation. The CAA Safety Regulation Group (SRG) Safety Plan contains a Safety Intervention which requires an annual review of the National Private Pilot Licence (NPPL) Medical Standards with a report to the SRG Executive Committee. Two reports have been given since the Licence was introduced, and the 2005 report (due in March) will incorporate this recommendation to review the NPPL medical standards to confirm that they adequately address the risk of medically induced distraction or incapacitation for instructors and pilots authorised to carry passengers.

CAA Action

The report was presented to the Executive Committee of the CAA on Monday 21 February 2005.

Status - Accepted - closed

SAFETY RECOMMENDATION 2004-067

It is recommended that the British Gliding Association should undertake a review of their medical standard requirements to assess whether it remains appropriate for glider pilots with any valid instructional ratings to give flying instruction in gliders whilst only in possession of a valid DVLA Class 2 Medical Declaration.

Response

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-068

It is recommended that the British Gliding Association require regular inspections to be conducted on the left wing bevel gear support structure associated with the airbrake actuation system of the SZD Puchacz glider, paying particular attention to the bond between the gear support web and the inner face of the wing root rib.

Response

Status - Response Awaited - open

SAFETY RECOMMENDATION 2004-100

The Civil Aviation Authority should re-emphasise the advice to pilots concerning the need to discuss with their treating physician and/or GP, any changes in medical condition, treatment, or the need for additional investigations not previously thought necessary when renewing or applying for medical documentation in relation to a flying licence.

Response

The CAA accepts this recommendation. The explanatory notes to the Medical Declaration which pilots with a National PPL are required to sign, and the CAA web site advice, have been changed to re-emphasise that pilots should discuss with their treating physician and/or GP any changes in their medical condition, their treatment or the need for additional investigations, at any time, not just when they are renewing or applying for medical documentation in relation to their licence. This will be further re-emphasised to all General Aviation pilots by an article in a forthcoming GASIL CAA safety publication.

Status - Accepted - closed

Sports Vega Glider T65D	Wormingford Airfield, Colchester	23-Jun-2002	Accident
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AAIB Bulletin: 7/2004
FACTOR: F38/2004

Synopsis

This accident was the subject of an investigation conducted on behalf of the AAIB by the British Gliding Association (BGA). Further investigation, concerning the apparent failure of the pilot's restraint harness, was undertaken by the AAIB.

A practice 'competition finish' was being attempted when the glider descended below tree top level but failed to climb again due to insufficient energy. The aircraft crashed through the upper branches of the trees and came to rest in a field. The pilot was released from his harness during the impacts. He sustained serious injuries and the aircraft was damaged beyond economic repair.

SAFETY RECOMMENDATION 2004-046

The British Gliding Association should review the document 'Maintenance of seat harnesses and belts' so as to reflect best industry practice and to provide clearer guidance for airworthiness inspection.

Status - Response Awaited - open

Index by Section

Aircraft Type	Location	Date	Incident / Accident	Page No
Section 1	Aeroplanes above 5,700kg MTWA			
Fokker F27-500	Bournemouth Airport	07-May-2004	Incident	3
Raytheon 390 Premier	Blackbushe Airport	07-Apr-2004	Accident	4
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Boeing 737-59D	Cardiff Airport	21-Feb-2004	Accident	8
Airbus A320-232	Overhead Birmingham	29-Nov-2003	Incident	8
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Embraer 145-EP	Venice Airport, Italy	15-Nov-2003	Incident	11
L1011-500 Tristar	London Stansted Airport	19-Aug-2003	Accident	11
Airbus A320-200	Cardiff International Airport	03-Aug-2003	Incident	12
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Airbus A320-200	Bristol Lulsgate Airport	16-Jun-2003	Accident	21
HS125-700A	London Luton Airport	13-Jun-2003	Incident	22
Boeing 737-436	In flight near Lyon, France	30-May-2003	Incident	23
Airbus A321-231	Approx 70nm south-east of Vienna	26-May-2003	Incident	24
BAe 146-300	In the cruise, near Carlisle, Cumbria	02-Mar-2003	Incident	25
Swearingen SA227-AC Metroliner	Aberdeen Airport	24-Dec-2002	Accident	25
BAe 146-200	During climb from Birmingham to Belfast City	12-Dec-2002	Accident	26
Boeing 747-300	London Heathrow Airport	07-Dec-2002	Accident	29
Boeing 727-230F Freighter	East Midlands Airport	19-Nov-2002	Incident	30
Boeing 737-436	Near Clacton, Essex	08-Nov-2002	Incident	31
Boeing 747-240B	Manchester International Airport	13-Jun-2002	Incident	32
DHC-8-311	30nm north-east of Newcastle Airport	22-Apr-2002	Incident	33
Dornier 328-100	Edinburgh Airport	06-Mar-2002	Accident	34
Boeing 737-8AS	London Stansted Airport	27-Feb-2002	Incident	35
EMB145	En Route - Divert to EMA	15-Feb-2002	Incident	37
Challenger CL600	Birmingham Airport	04-Jan-2002	Accident	38
Shorts SD3-60 / Tornado F3	26.5nm north of Newcastle Airport	20-Mar-2000	Incident	39

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Section 2	Aeroplanes above 2,250kg and below 5,700kg MTWA			
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Cessna C404 Titan	Near Glasgow Airport	03-Sep-1999	Accident	45

Section 3	Aeroplanes 2,250kg MTWA and below			
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Cozy	1 mile south of Junction 12, M5 motorway, Glos	10-Jul-2004	Accident	46
Grob G115E	4.5nm south-west of Salisbury, Wiltshire	29-Jun-2004	Accident	48
Avid Speedwing (Modified)	Caernarfon Airport	28-Mar-2004	Accident	49
Piper PA-25-235	Crowland Aifield, Lincolnshire	01-Feb-2004	Accident	49
Piper PA-46-350P	Alderney Airport	30-Jan-2004	Accident	50
Sirocco 377GB	Near Ashby-de-la-Zouch, Leicestershire	27-Jan-2004	Accident	51
Piper PA-28-161	Wellesbourne Mountford, Warwickshire	28-Oct-2003	Accident	52
Robin DR400-180	Little Staughton Airfield, Bedfordshire	26-Sep-2003	Accident	53
Stampe SV4C-C	Near Redhill, Surrey	26-Jul-2003	Incident	54
Cessna F152	Headcorn Aerodrome, Kent	01-Jul-2003	Accident	55
Denney Kitfox MK4	Smeeton Westerby, Leicestershire	13-Jun-2003	Accident	56
Spirit of St Louis Replica	Coventry Airfield	31-May-2003	Accident	57
Piper PA-34-200T	Sherburn-in-Elmet Aerodrome, Yorkshire	08-May-2003	Accident	58
Yak 52	Two miles north-east of Towcester	05-Jan-2003	Accident	59
Cessna 152	Chenies, Buckinghamshire	28-Sep-2002	Incident	60
Miles Gemini 1A	Old Warden Aerodrome, Bedfordshire	24-Aug-2002	Incident	61
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Section 5	Rotorcraft 5,700kg MTWA and above			
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Bell 206-L	Longfough Farm, near Pathhead, Midlothian	30-Apr-2003	Accident	83
RAF 2000	Hall Farm Strip, near Lichfield	05-Feb-2003	Accident	83
Bell 206B JetRanger III	Cudham, Kent	17-Jan-2003	Accident	85
RAF 2000 GTX-SE	Black Notley, Essex	17-May-2002	Accident	86
Hughes 269C	Hare Hatch, Berkshire	08-Mar-2000	Accident	88

Section 8	Others			
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Sports Vega Glider T65D	Wormingford Airfield, Colchester	23-Jun-2002	Accident	92

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2004-106	DH82A Tiger Moth	Duxford Aerodrome, Cambridgeshire	29-Jul-2004	47
2004-104	Miles Gemini 1A	Old Warden Aerodrome, Bedfordshire	24-Aug-2002	61
2004-103	Boeing 737-59D	Cardiff Airport	21-Feb-2004	8
2004-102	Grob G115E	4.5nm south-west of Salisbury, Wiltshire	29-Jun-2004	48
2004-101	Piper PA-25-235	Crowland Airfield, Lincolnshire	01-Feb-2004	50
2004-100	Puchacz Glider	Near Husbands Bosworth, Leicestershire	18-Jan-2004	92
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2004-098	Raytheon 390 Premier	Blackbushe Airport	07-Apr-2004	5
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2004-091	L39 Albatros L39ZO	Near Duxford Airfield, Cambridgeshire	02-Aug-2003	42
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2004-086	Robin DR400-180	Little Staughton Airfield, Bedfordshire	26-Sep-2003	53
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2004-075	Stampe SV4C-C	Near Redhill, Surrey	26-Jul-2003	54
2004-074	Airbus A321-211 / Boeing 747-436	London Heathrow Airport	23-Mar-2004	7
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2004-071	Avid Speedwing (Modified)	Caernarfon Airport	28-Mar-2004	49
2004-070	Boeing 747-300	London Heathrow Airport	07-Dec-2002	30
2004-069	Boeing 747-300	London Heathrow Airport	07-Dec-2002	30
2004-068	Puchacz Glider	Near Husbands Bosworth, Leicestershire	18-Jan-2004	92
2004-067	Puchacz Glider	Near Husbands Bosworth, Leicestershire	18-Jan-2004	92
2004-066	Puchacz Glider	Near Husbands Bosworth, Leicestershire	18-Jan-2004	91
2004-065	Puchacz Glider	Near Husbands Bosworth, Leicestershire	18-Jan-2004	91
2004-062	Airbus A320-232	Overhead Birmingham	29-Nov-2003	9
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2004-060	Airbus A320-232	Overhead Birmingham	29-Nov-2003	9
2004-059	Airbus A320-232	Overhead Birmingham	29-Nov-2003	9
2004-058	Airbus A320-200	Bristol Lulsgate Airport	16-Jun-2003	22
2004-057	Airbus A320-200	Bristol Lulsgate Airport	16-Jun-2003	22
2004-056	Airbus A320-200	Bristol Lulsgate Airport	16-Jun-2003	21
2004-055	Airbus A320-200	Bristol Lulsgate Airport	16-Jun-2003	21
2004-054	Piper PA-46-350P	Alderney Airport	30-Jan-2004	50
2004-053	Boeing 737-8AS	London Stansted Airport	27-Feb-2002	37
2004-052	Boeing 737-8AS	London Stansted Airport	27-Feb-2002	37
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2004-032	L1011-500 Tristar	London Stansted Airport	19-Aug-2003	12
2004-031	Swearingen SA227-AC Metroliner	Aberdeen Airport	24-Dec-2002	26
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2004-029	Embraer 145EU	Birmingham Airport	18-Nov-2003	10
2004-028	Embraer 145EU	Birmingham Airport	18-Nov-2003	10
2004-027	Embraer 145EU	Birmingham Airport	18-Nov-2003	10
2004-026	Embraer 145-EP	Venice Airport, Italy	15-Nov-2003	11
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2004-021	DHC-8-311	30nm north-east of Newcastle Airport	22-Apr-2002	34
2004-020	Piper PA-28-161	Wellesbourne Mountford, Warwickshire	28-Oct-2003	52
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2004-011	Cessna 152	Chenies, Buckinghamshire	28-Sep-2002	61
2004-010	Denney Kitfox MK4	Smeeton Westerby, Leicestershire	13-Jun-2003	57
2004-009	Boeing 747-240B	Manchester International Airport	13-Jun-2002	32
2004-008	Airbus A310-308	Manchester Airport	15-Jul-2003	18
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2004-004	Sikorsky 76-C Spirit	Cranfield Airfield, Bedfordshire	11-Oct-2003	75
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2003-120	BAe 146-200	During climb from Birmingham to Belfast City	12-Dec-2002	27
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2001-082	Hughes 269C	Hare Hatch, Berkshire	08-Mar-2000	89
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GLOSSARY OF ABBREVIATIONS

ACAS	Airborne Collision Avoidance System	KTAS	knots true airspeed
ACARS	Automatic Communications And Reporting System	lb	pound(s)
ADF	automatic direction finding equipment	LP	low pressure
AFIS(O)	Aerodrome Flight Information Service (Officer)	LDA	landing distance available
AFRS	Aerodrome Fire & Rescue Service	LPC	licence proficiency check
agl	above ground level	ltr	litre(s)
AIC	Aeronautical Information Circular	m	metres
amsl	above mean sea level	mb	millibar(s)
AOM	aerodrome operating minima	MDA	Minimum Descent Altitude
APU	auxiliary power unit	METAR	a timed aerodrome meteorological report
ASI	airspeed indicator	min(s)	minutes
ATC(C)(O)	Air Traffic Control (Centre)(Officer)	mm	millimetre(s)
ATIS	Automatic Terminal Information System	mph	miles per hour
BMAA	British Microlight Aircraft Association	MTWA	maximum total weight authorised
BGA	British Gliding Association	N	Newtons
BBAC	British Balloon and Airship Club	N_R	Main rotor rotation speed (rotorcraft)
BHPA	British Hang Gliding & Paragliding Association	N_g	Gas generator rotation speed (rotorcraft)
CAA	Civil Aviation Authority	N_1	engine fan or LP compressor speed
CAVOK	Ceiling And Visibility OK (for VFR flight)	NDB	non-directional radio beacon
CAS	calibrated airspeed	nm	nautical mile(s)
CG	centre of gravity	NOTAM	Notice to Airman
cm	centimetres	OPC	Operator proficiency check
cc	cubic centimetres	PAPI	Precision Approach Path Indicator
°C,F,M,T	Celsius, Fahrenheit, magnetic, true	PF	Pilot flying
DGAC	Direction Général à l'Aviation Civile	PFA	Popular Flying Association
DME	distance measuring equipment	PIC	pilot in command
EAS	equivalent airspeed	PNF	Pilot not flying
EASA	European Aviation Safety Agency	psi	pounds per square inch
EGPWS	Enhanced GPWS	QFE	pressure setting to indicate height above aerodrome
EGT	exhaust gas temperature	QNH	pressure setting to indicate elevation above mean sea level
EPR	Engine Pressure Ratio	RA	Resolution Advisory
ETA	estimated time of arrival	rpm	revolutions per minute
ETD	estimated time of departure	RTF	radiotelephony
FAA	Federal Aviation Administration (USA)	RVR	runway visual range
FIR	flight information region	SAR	Search and rescue
FL	flight level	SSR	secondary surveillance radar
ft	feet	TA	Traffic Alert
ft/min	feet per minute	TAF	Terminal Aerodrome Forecast
g	normal acceleration	TAS	true airspeed
GPS	Global Positioning System	TAWS	Terrain Awareness and Warning System
GPWS	Ground Proximity Warning System	TCAS	Traffic Collision Avoidance System
hrs	hours (clock time as in 12:00 hrs)	TGT	turbine gas temperature
HP	high pressure	TODA	takeoff distance available
hPa	hectopascal (equivalent unit to mb)	UHF	ultra high frequency
IAS	indicated airspeed	USG	US gallons
IFR	Instrument Flight Rules	UTC	Co-ordinated Universal Time (the contemporary equivalent of GMT)
ILS	Instrument landing system	V_1	Takeoff decision speed
IMC	Instrument Meteorological Conditions	V_2	Takeoff safety speed
in	inch(es)	V_R	Rotation speed
IP	intermediate pressure	V_{REF}	Reference airspeed (approach)
IR	Instrument Rating	V_{NE}	never exceed airspeed
ISA	International Standard Atmosphere	VASI	Visual Approach Slope Indicator
kg	kilogram(s)	VFR	Visual Flight Rules
KCAS	knots calibrated airspeed	VHF	very high frequency
KIAS	knots indicated airspeed	VMC	Visual Meteorological Conditions
KTAS	knots true airspeed	VOR	VHF omni-range
km	kilometre(s)		
kt	knot(s)		

