Safety Regulation Group

Civil Aviation Authority

CAP 702

Progress Report 1999

CAA and DETR Responses to Air Accidents Investigation Branch (AAIB) Safety Recommendations

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CAA and DETR Responses to AAIB Recommendations received up to 31 December 1998, presented to the Secretary of State for the Environment, Transport and the Regions

Important Note

The CAA has made many of the documents that it publishes available electronically (in addition to traditional printed format). The contents of this document are unchanged from the previously printed version. For consistency with other CAA documents new cover pages have been added. Further information about these changes and the latest version of documents can be found at www.caa.co.uk.

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Foreword

In the UK, the Civil Aviation Authority (CAA) is responsible for civil air safety ie. the establishment and monitoring of standards, including the licensing of flight crews, aircraft engineers, air traffic controllers and aerodromes and the certification of airlines and aircraft.

The Air Accidents Investigation Branch (AAIB), a branch of the Department of the Environment, Transport and the Regions (DETR), 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 UK.

The two functions, and associated responsibilities, of accident investigation and safety regulation are clearly different and the two organisations 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 ie. the responsibility of the CAA. Thus a good working relationship between the two organisations is essential, while in no way jeopardising the independence of the accident investigation.

While day to day liaison is maintained between the CAA and the AAIB in the aftermath of any accident, the formal procedure by which the AAIB identify and convey to the CAA, 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 in place formal procedures for the receipt and evaluation of such Recommendations and initiation of necessary action. In its evaluation the CAA has to consider all the implications of the Recommendation and any action being proposed; it must also take into account the views of other Regulatory Authorities eg. the European Joint Aviation Authorities or any Authority responsible for the initial certification of the aircraft type. 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. In the case of AAIB Formal Investigations for which an Aircraft Accident Report (AAR) is published, all Recommendations made are listed in the final AAR. In such cases, the CAA publishes its Response to the Recommendations on the day the AAR is published.

The CAA Responses to all Recommendations addressed to the CAA are published, initially, by means of a FACTOR (Follow-up Action on Occurrence Report) but will subsequently appear in this annual Progress Report.

Some Recommendations involve long term investigation or research. In order to determine appropriate action when this is so, the CAA's response will indicate that the status of the Recommendation is 'Open' until all action by the CAA has been completed. This Report contains the current status of earlier Recommendations addressed to the CAA which were listed as 'Open' in the previous Progress Report.

Once CAA action is completed it will be designated 'Closed' in this Report and will not appear in subsequent Reports. However, in some instances this may mean that further action is still necessary but is being progressed by organisations outside the jurisdiction of the CAA, for example, by the Joint Aviation Authorities. In these cases CAA will continue to monitor the progress on these Recommendations as part of its normal regulation activity.

The Report

This is the tenth annual Progress Report submitted to the Secretary of State for the Environment, Transport and the Regions. It contains all Recommendations addressed to the CAA and received during 1998 together with the CAA's responses.

The Report also contains all Recommendations addressed to the CAA that remained 'Open' in the ninth annual Progress Report together with a statement of their position as at 31 May 1999 and all 'Open' Recommendations addressed to the DETR.

The Recommendations addressed to the CAA have been separated into three Parts:–

Part 1 – Aeroplanes at or above 5700kg Maximum Take-off Weight Authorised (MTWA)
Part 2 – All Rotorcraft.
Part 3 – Aeroplanes below 5700kg MTWA and others, (eg. Balloons)

Note: The definition of Aeroplane and Rotorcraft are as stated in the Air Navigation Order

Within each Part the accidents are listed by event date but in reverse chronological order. This date order should not be taken as an indication of the date of receipt of the Recommendation by the CAA as some recommendations are received a significant time after an accident.

Some of the Recommendations made by the AAIB are addressed to organisations other than the CAA. Following a request from the DETR, responses to Recommendations involving the DETR appear in a Part 4.

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CAA Responses to AAIB Recommendations 10th Report

1 INTRODUCTION

This Report is in response to the Secretary of State for the Environment, Transport and the Regions' request to the CAA for Annual Reports on the status and progress of its responses to the Recommendations made to the CAA from the Air Accidents Investigation Branch. This Report covers all of those Recommendations which remained 'Open' from the previous Report and all Recommendations received during 1998.

2 RECOMMENDATIONS – STATUS SUMMARY

2.1 Recommendations Outstanding from Previous Report

37 Recommendations remained 'Open' from the previous Report, of which 14 have now been closed and 23 remain 'Open' requiring further CAA action.

2.2 New Recommendations Received

During 1998, a total of 39 Recommendations addressed to the CAA were received compared with 46 for 1997. A Summary of the Acceptance and Current Status of these is as follows:

	Acceptance				*Current Status*	
	Fully	*Partially*	*Fully & Partially*	*Not Accepted*	*Open*	*Closed*
PRE 1997	586	77	663	131	17	772
1997	29	7	36	10*	6	31
1998	27	8	35	4	13	26
TOTAL	642	92	734 (83%)	145	36	829

* While in this period there were 10 Recommendations which had not been accepted by the CAA, it should be noted that, in effect, five of these Recommendations dealt with the same broad issue.

Of the currently Open Recommendations, it is expected that about 17 will be closed before the end of 1999.

3 OVERALL SUMMARY OF RECOMMENDATIONS ADDRESSED TO THE CAA

The total number of Recommendations received by the Authority since 1976 is 879.

It should be noted that the average number of Recommendations either fully or partially accepted is currently 83% of the total and shows little variation over the years.

Part 1 – AAIB Recommendations relating to Aeroplanes at or above 5700kg MTWA

B737; B757	**London Heathrow Airport**	**27Aug97**	**Incident**

References: 5/98 dated 15 Oct 98
FACTOR F8/98 dated 15 Oct 98

RECOMMENDATION 98–19

It is recommended that the National Air Traffic Services Ltd should ensure that the missed approach procedures at London Heathrow Airport are revised to minimise the potential for confliction with departing traffic and to reduce the requirement for ATC co-ordination.

Status – Fully Accepted – Closed

CAA Response

National Air Traffic Services Ltd accepts this Recommendation. Implementation of revised missed approach procedures for Heathrow Airport, which meet the criteria called for by the Recommendation, is complete and was introduced on 10 September 1998.

RECOMMENDATION 98–20

It is recommended that the National Air Traffic Services Ltd should reduce the present blanking on the Air Traffic Monitor screens at London Heathrow Airport to maximise the operationally relevant information presented to controllers.

Status – Fully Accepted – Closed

CAA Response

National Air Traffic Services Ltd accepts this Recommendation. Refinements have been made and the blanking area has been reduced to enable more extensive coverage of the runways and overlying airspace. The area displayed on the ATM will continue to be refined with operational experience.

B757-200	London (Gatwick)	24Aug97	Incident

References: Bulletin 7/98 dated 17 Jul 98
FACTOR F23/98 dated 2 Nov 98

RECOMMENDATION 98–47

It is recommended that the CAA positively encourage all UK Public Transport Operators to assess their current aircraft Emergency and Abnormal Checklists or Quick Reference Handbooks with a view to improving their format and content in accordance with the guidelines published in CAP 676.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The Authority has sent a copy of CAP 676 ('Guidelines for the Design and Presentation of Emergency and Abnormal Checklists', published in September 1997) to all UK public transport operators. In addition, Flight Operations Department Communication 10/98, dated 16 March 1998, urged such operators to read the contents of the publications and determined whether, as a result, amendment action is needed to the style and presentation of their emergency and abnormal checklists.

Boeing 737-200; Ilyushin 76 & two SU30	10nm East of Compton VOR	16Jul97	Incident

References: Bulletin 12/97 dated 9 Dec 97
FACTOR F7/98 dated 9 Apr 98

RECOMMENDATION 97–45

The Air Traffic Services Standards Department (ATSSD) of the CAA Safety Regulation Group (SRG) should conduct a review of the Manual of Air Traffic (MATS) Part 1 provisions for the conduct of military formation flights as GAT (civil traffic) in controlled airspace.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. The Air Traffic Services Standards Department is conducting a review of the requirements for military formation flights operating as General Air Traffic (GAT) within controlled airspace to determine the provisions required to be made in the Manual of Air Traffic Services (MATS) Part 1 for such operations. Amendments will be made to the appropriate document following the review, which is expected to be completed by June 1998.

CAA Action

The review of the requirements for military formation flights within Controlled Airspace is now complete. Currently, action is in hand to obtain assurance as to the efficacy of the use of the present 5 nm separation criteria from such flights and, once complete, appropriate procedures will be published in MATS Part 1.

RECOMMENDATION 97–47

NATS should ensure that the maximum possible amount of any supplementary flight plan information is shown in the remarks field of the flight progress strip or any other flight plan display media.

Status – Fully Accepted – Open

CAA Response

NATS accepts this Recommendation. NATS are presently exploring the feasibility of providing as much supplementary flight plan information as possible to controllers.

CAA Action

NATS continues to work towards providing as much supplementary flight plan information as possible to controllers. Resolution is expected by the end of the year 2000.

Boeing B747-300 /Gulfstream IV	**14NM East of Lambourne VOR**	**3Jul97**	**Incident**

References: AIR 4/98 dated 17 Sep 98
FACTOR F18/98 dated 17 Sep 98

RECOMMENDATION 98–36

The CAA, in conjunction with the various ATS providers, should ensure that controllers are familiar with those operating characteristics of the aircraft for which they are likely to be responsible and which affect the provision of ATS. Consideration should be given to suitable methods which may include the use of simulators and familiarisation flights as a means of achieving this objective.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. It is considered essential that controllers are aware of the operating characteristics of the aircraft for which they are likely to be responsible and which affect the provision of ATS.

The Authority's Safety Regulation Group will therefore enter into a period of consultation with ATS providers to consider how current initiatives aimed at achieving this awareness can be enhanced.

CAA Action

A review of current methods used to ensure that controllers are familiar with those operating characteristics of the aircraft for which they are likely to be responsible and which affect the provision of Air Traffic Services (ATS) has been conducted by the Authority's ATS Regional Managers and Principal Inspectors. The review group concluded that the current extent and nature of the activity being undertaken is satisfactory. Further reviews of familiarisation initiatives will be conducted at regular intervals to ensure that the industry's needs continue to be met.

RECOMMENDATION 98–37

The CAA, in conjunction with other ECAC members should prepare UK AIP instructions relating to the present and future operation of TCAS, taking account of the relevant ICAO Standards and Recommended Practices.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The Authority, in conjunction with other ECAC members, will prepare UK AIP instructions relating to the present and future operations of TCAS, taking into account the relevant ICAO Standards and Recommended Practices.

CAA Action

The UK AIP entry relating to the operation of TCAS has been amended to reflect ICAO Standards and Recommended Practices (UK AIP ENR 1-1-3-2 General Flight Procedures – 31 December 1998).

RECOMMENDATION 98–39

NATS should ensure that the development and introduction of an effective MTCA system is given a high priority.

Status – Fully Accepted – Open

CAA Response

NATS accepts this Recommendation. NATS has already commenced work in this area in preparation for providing an MTCA at its Swanwick Centre.

CAA Action

NATS continues to work on preparations to include an MTCA at its Swanwick Centre.

Fokker F27-500	**Jersey**	**6May97**	**Accident**

References: Bulletin 12/97 dated 9 Dec 97
FACTOR F2/98 dated 11 Mar 98

RECOMMENDATION 97–68

The CAA should require that an aircraft operator maintains, for each recorder installation type, a data frame layout document which contains details of all parameters recorded, the layout of the recorded data and the algorithms required to convert that data to engineering units. The layout of the document should be of a format standard to be stipulated by the CAA.

Status – Partially Accepted – Open

CAA Response

The Authority partially accepts this Recommendation. The Civil Aviation Authority Specification 10A, which covers the installation of flight data recorders into aircraft, already requires a reference document to be prepared that provides details of the conversion data and logic required for the translation of the data held in memory to parameters expressed in engineering units. The Authority's earlier version of Specification 10 allows the record to be kept as an analogue trace, digital transcription or original record. These Specifications are provided as a means by which operators can meet the requirements of the Air Navigation Order. In addition, the implementation of Joint Aviation Requirement JAR–OPS 1.160 has required JAR–OPS operators to keep a document which presents the information necessary to retrieve and convert the stored data into engineering units. The Authority is, however, aware that the accident investigators of various states are collaborating to define and standardise documents for the data frame layout and conversion of flight recorder data to engineering units. The Authority will, therefore, await the outcome of this work with the intention of promulgating recommendations for a standardised document.

CAA Action

The initial work of defining and standardising documents for the data frame layout and conversion of flight recorder data to engineering units has been completed and is currently being considered by the international EUROCAE Working Group 50, who are currently reviewing flight data recorder requirements. The Authority's future position will be determined when the review of the working group has been completed and is made known. Target date: December 1999.

RECOMMENDATION 97–69

The CAA should require that, prior to a scheduled mandatory flight data recorder readout being conducted, the aircraft operator shall ensure that the facility conducting the readout is provided with a copy of the data frame layout document applicable to the installation to be assessed.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The Authority will issue a Flight Operations Department Communication (FODC) requiring operators to include procedures in their Maintenance Management Exposition (MME) to ensure that the facility conducting the readout is provided with a copy of the data frame layout document applicable to the installation to be assessed. Target date: 31 August 1998.

CAA Action

The Authority issued Flight Operations Department Communication number 12/98, dated 8 September 1998, requiring operators to include procedures in their Maintenance Management Exposition (MME) to ensure that the facility conducting the readout is provided with a copy of the data frame layout document applicable to the installation to be assessed.

RECOMMENDATION 97–70

The CAA should require that an organisation conducting scheduled mandatory readouts from a digital flight data recorder has procedures in place to ensure that all information, within a data frame layout document, is correctly interpreted, used for a scheduled mandatory readout of the relevant recording installation and that any assessment is conducted only on data that has been converted to engineering units. Furthermore, any report issued by the organisation shall reference, both by document number and issue status, the data frame layout document against which the readout was performed.

Status – Partially Accepted – Open

CAA Response

The Authority partially accepts this Recommendation. Whilst understanding the rationale for this Safety Recommendation the Authority foresees practical difficulties if organisations were constrained to convert to engineering units and to interpret a complete data recording against a data frame. Consequently, the Authority proposes to consult industry on this matter to determine the value of such a requirement.

The Authority does, however, accept that reports on FDR readouts should reference, both by document number and issue status, the applicable data frame document used. The Authority will therefore advise all organisations who undertake FDR readouts that the associated reports are to contain this information. Target date: 31 December 1998.

CAA Action

The CAA has set up a working group to create a Best Practice document for flight data recorder (FDR) replay. This document is intended to provide guidance on all aspects of FDR replay, including those associated with this recommendation, and will be made available to operators and those organisations who undertake FDR readouts. The document is planned to be issued by the end of 1999.

Boeing 747-400	Lilongwe, Malawi	5Apr97	Accident

References: Bulletin 11/97 dated 7 Nov 97
FACTOR F26/97 dated 31 Dec 97

RECOMMENDATION 97–42

It is recommended that the CAA and FAA monitor the manufacturer's review of the Hard Landing Inspections and any subsequent amendment to the 747 Maintenance Manual to ensure that there is a high level of confidence in detecting structural damage which follows a heavy landing.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

The Authority will request that the FAA monitors the manufacturer's review of the Hard Landing Inspections. Subsequent amendments to the Boeing 747 Maintenance Manual hard landing inspections will be reviewed by the Authority to confirm that the instructions given are adequate to provide a high level of confidence that structural damage will be detected following a hard landing.

CAA Action

The review of the 747 Maintenance Manual Chapter 5 'Conditional Inspections' has shown that skin panels behind wing-to-body fairings and keel beam webs are not specifically addressed. The manufacturer has undertaken to provide additional inspections in the maintenance manuals by 31 July 1999.

B757-200	Birmingham Airport	27Jan97	Accident

References: Bulletin 4/98 dated 16 Apr 98
FACTOR F3/98 dated 31 Jul 98

RECOMMENDATION 98–31

It is recommended that the CAA require organisations offering type rating courses to amend their syllabus to include the subject of cadmium embrittlement, where relevant.

Status – Not Accepted – Closed

CAA Response

The Authority does not accept this Recommendation. The Authority believes that the necessary level of safety is achieved by the present system which functions as follows in respect of cadmium embrittlement.

The basic knowledge required for licence without type ratings covers the subject of metals, protective finishes and fatigue. Whilst not specifically detailed for study as an individual topic, cadmium embrittlement, hydrogen embrittlement and similar problems with materials would be expected to be known in general terms. The certifying engineer must be dependent upon the potential hazards being identified by the manufacturer and promulgated by cautions or specific actions within the relevant sections of the maintenance manual.

The UK is to require training organisations to be approved in accordance with Joint Aviation Requirement – 147 by 1 June 2001. As part of this approval process organisations will be expected to demonstrate that the training for a particular type includes instruction on the manufacturer's maintenance information and the use of cautions or notes to highlight specific maintenance hazards or requirements.

RECOMMENDATION 98–32

It is recommended that the CAA requires the operator to review their procedures for maintenance away from a main base with the object of making them more robust, ensuring compliance with the AMM and removing some of the pressure from the certifying engineers sent to rectify aircraft down route.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The matter has been discussed with the operator's engineering organisation, as a result of which its procedures for the conduct of maintenance away from a main base have been reviewed. The engineering organisation's maintenance procedures have now been amended, emphasising the need to comply with the maintenance manual. These amended procedures now form part of the CAA-approved Maintenance Organisation Exposition which is subject to routine monitoring by the Authority.

BAe146	**London (City) Airport**	**18Nov96**	**Incident**

References: Bulletin 8/97 dated 11 Aug 97
FACTOR F27/97 dated 1 Nov 97

RECOMMENDATION 97–27

It is recommended that the CAA, in conjunction with the manufacturer, airport authority and operators, carry out a project to determine the scatter of significant landing parameters for the BAe146 aircraft operating into London (City) Airport.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The Authority is currently drafting the specifications and requirements for a trial, to be conducted in conjunction with the manufacturer, airport authority and operators, to determine the scatter of significant landing parameters for the BAe 146 aircraft operating into London (City) Airport. It is intended that this trial will be completed by 31 December 1998.

CAA Action

The trial to determine the scatter of significant landing parameters for the BAe 146 aircraft operating into London City Airport has now been completed.

Boeing 737-400; MD81	**Lambourne Hold**	**12Nov96**	**Incident**

References: 5/97 dated 1 May 97
FACTOR F21/97 dated 26 Aug 97

RECOMMENDATION 97–19

It is recommended that, where STCA programs are in use, NATS ensures that information is provided in such a way that accurate Mode C data for all aircraft involved is clearly and continuously visible to the controller.

Status – Partially Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The National Air Traffic Services Ltd (NATS) is currently conducting research, which is planned to be complete by December 1997, to determine the accuracy of Mode C data when aircraft are in close proximity. If the research indicates that the integrity of such data can be assured, NATS will introduce a facility to display accurate Mode C information to controllers of aircraft involved in Short Term Conflict Alert (STCA) situations.

In addition, should the research prove the viability of such a facility, the Authority's Safety Regulation Group will consult with industry to ensure that future STCA systems incorporate provision of aircraft callsign and level/altitude information, which obviates the difficulties caused by data block overlap.

CAA Action

The NATS Operational Display Equipment – LATCC (NODE-L) has been modified so that the Short Term Conflict Alert list provides clear and continuous level information throughout an encounter.

RECOMMENDATION 97–20

It is recommended that NATS investigate improvements to radar displays such that controllers are able to see label information in circumstances, particularly in holding stacks, when the labels would normally overlap.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. The research notified in the response to Safety Recommendation 97–19 will also be used to determine whether the advances in radar display systems will allow a facility to be introduced so that data block overlap does not occur. If the research indicates the viability of such a facility the National Air Traffic Services Ltd will consider its introduction as a matter of urgency. Similarly, the Authority will consult with industry with regard to introducing a requirement for such a facility into current and future Air Traffic Services radar displays.

CAA Action

A programme to allow a 'windows' based viewing of aircraft in holding stacks is to be incorporated into the NATS Operation Display Equipment – LATCC (NODE-L). It is expected that the equipment will become operational in late summer 1999.

HS748	**Liverpool Airport**	**16Aug96**	**Accident**

References: AAR 1/99 dated 4 Feb 99
FACTOR F1/99 dated 4 Feb 99

RECOMMENDATION 96–69

The CAA should require an early check of UK registered HS748 aircraft for adequate flight control system clearances.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation.

In addition to the fleet-wide gust lock inspections that were carried out following this accident, the Authority will continue to work with the aircraft manufacturer to develop a mechanism which ensures adequate flight control system clearances on UK registered HS748 aircraft. Detailed considerations are expected to be concluded by September 1999.

RECOMMENDATION 96–70

The CAA should require an early check of aircraft with an operating and maintenance background similar to G-ATMI's for foreign objects that could possibly interfere with flight control systems.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

The Authority agrees with the principle that in any aircraft, regardless of operating and maintenance background, foreign objects must not be allowed to interfere with the correct operation of flight control systems. Control of foreign objects and loose articles in aircraft is considered to be a 'best practice' which is the responsibility of all personnel associated with the manufacture, operation and maintenance of aircraft. The Authority continues to highlight foreign object problems to Aircraft Owners, Licensed Aircraft Engineers and Approved Organisations. This is done through the various CAA/industry forums and by publishing guidance in relevant documents. To raise awareness further, a revision to Airworthiness Notice 12 Appendix 7 has been drafted. The Airworthiness Notice was published in March 1999.

In addition the Authority's Aircraft Maintenance Standards Department (AMSD) has issued an internal circular. This emphasises to AMSD survey staff the need to encourage those concerned with airworthiness of the benefits from implementing best practices designed to reduce the risk of interference by foreign objects and loose articles.

RECOMMENDATION 96–71

The CAA should require an early check of the complete gust lock system on UK registered HS748 aircraft, with particular attention to:

1 The rigging of the system.

2 Play at the joint between the flight deck lock lever assembly input and output levers.

3 Contact between the two aft differential pulley idler levers.

4 Excessive play in the aft differential pulley idler lever bearings.

5 Incorrect aft differential pulley idler lever orientation.

6 Contact of the aft differential pulley assemblies with the structure.

7 Contact between the roller lever and lock plate of elevator, aileron and rudder gust locks.

8 Absence of any of the bushes at the pivot of the elevator gust lock roller lever.

9 Distortion of the elevator gust lock roller lever.

10 Excessive separation of any gust lock roller from its 'OFF' stop with the flight deck lever assembly at its 'Minimum OFF' position, with limits to be supplied by the manufacturer.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

Alert Service Bulletin HS748-A27-128 was made mandatory by the Authority and was issued on 20th December 1996. This Bulletin introduced new inspection, rectification and rigging actions to be applied to the HS748 gust lock system and highlighted correct system maintenance practices.

The Bulletin introduced an initial inspection within 30 days of receipt of the Bulletin and required a subsequent in depth inspection within a further 750 flight hours. Both inspections are to be repeated at 'C Check' and 'Period 1' intervals respectively.

RECOMMENDATION 96–72

The CAA should require measures to prevent contact between the aft differential levers of the HS748 flight control gust lock system.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

Alert Service Bulletin HS748-A27-128 was made mandatory by the Authority and was issued on 20th December 1996. This ASB introduced measures to prevent contact between the aft differential levers of the HS748 flight control gust lock system.

An initial inspection was required within 30 days of receipt of the ASB and inspections are to be repeated at every 'C' Check and Period 1 maintenance interval to determine and maintain system serviceability. This includes checks of the aft differential pulley arms and associated rudder lock sideplates for adequate clearance and to identify deficiencies that might result in contact.

RECOMMENDATION 96–74

The CAA should require British Aerospace Regional Aircraft to introduce measures to preclude the possibility of any HS748 gust lock system cable turnbuckles jamming against floor beam aperture edges.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

The design, installation and maintenance standard of the flight control gust lock system was the subject of a CAA review with the aeroplane manufacturer and the relevant maintenance

organisation. As part of this review it was established that had the aeroplane been correctly rigged in accordance with the Aircraft Maintenance Manual, the turnbuckle could not have contacted or passed through the floor beam cut out.

However, to preclude the possibility of turnbuckles jamming against floor beam aperture edges, Service Bulletin HS748-A27-128 was made mandatory by the Authority and was issued on December 20 1996. This required an initial inspection within 30 days of receipt of the ASB and repeat inspections, together with system re-rigging, at every 'C' Check and Period 1 maintenance interval. Additional checks are specifically required to ensure clearance between the inboard cable turnbuckle and the cut out in the floor beam.

RECOMMENDATION 97–49

The CAA should require modification of the HS748 gust lock system to provide substantial overtravel of the mechanism with respect to the flight deck selector lever assembly.

Status – Partially Accepted – Open

CAA Response

The Authority partially accepts this Recommendation.

The Authority intends to review with the aeroplane manufacturer the practicality and benefits of a modification to provide substantial overtravel of the mechanism with respect to the flight deck selector lever assembly mechanisms, in order to determine whether such a modification should be required. It is intended to complete this review by 31st July 1999.

RECOMMENDATION 97–50

The CAA should require for UK registered HS748 aircraft the development and fitment of a system to continuously monitor the position of each of the three gust lock rollers and to provide an associated flight deck indication of a potentially unsafe condition.

Status – Partially Accepted – Open

CAA Response

The Authority partially accepts this Recommendation.

The Authority intends to review with the aeroplane manufacturer the practicality and benefits of developing and fitting a system which would monitor continuously the position of each of the three gust lock rollers and provide an associated flight deck indication of a potentially unsafe condition, in order to determine whether such a system should be required. It is intended to complete this review by 31st July 1999.

RECOMMENDATION 98–02

The CAA should prohibit the use of flight data recording systems that use a non-digital method of recording data.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

JAR–OPS 1 (Commercial Air Transport (Aeroplanes)) contains a provision which will prohibit the use of non-digital flight recorders on this class of aircraft after 1st April 2000. The Authority is in the process of implementing JAR–OPS 1.

RECOMMENDATION 98–03

The CAA should take additional measures aimed at ensuring that adequate standards of maintenance are achieved on UK registered aircraft and undertake more extensive monitoring of actual aircraft maintenance standards achieved, with effective enforcement action where these are found to be inadequate.

Status – Partially Accepted – Closed

CAA Response

The Authority partially accepts this Recommendation.

The Authority has always recognised the need for continuous improvement in its safety regulation: this remains a core objective of the Safety Regulation Group.

An example of the continuous improvement which directly relates to this Recommendation has been the adoption of JAR–145, Change 2. This introduced, for organisations approved to the JAR–145 maintenance code, the need to conduct both scheduled and random product audits. The effectiveness of these product audits will be monitored by the Authority during its routine oversight of aircraft maintenance organisations. The Authority is empowered under the provisions of the Air Navigation Order to implement enforcement actions where deemed necessary and appropriate.

RECOMMENDATION 98–04

The CAA should inform Foreign Airworthiness Authorities with responsibility for HS748 aircraft operations of the findings arising from this investigation and the associated Safety Recommendations.

Status – Partially Accepted – Closed

CAA Response

The Authority partially accepts this Recommendation.

The Authority is required by ICAO Annex 8, Part II paragraph 4.2 (Information related to continuing airworthiness of aircraft) to transmit mandatory continuing airworthiness information to appropriate Authorities. In this case, the manufacturer's Service Bulletin SB748-27-128, having been made Mandatory in response to a number of the AAIB Recommendations, was sent to all known operators and their responsible Authorities.

The Authority does not consider that it should directly transmit other findings or Recommendations made by AAIB. The manufacturer is required to notify operators of all important service-related information, in accordance with the ICAO Airworthiness Technical

Manual, BCAR Section A (Airworthiness Procedures where CAA has Primary Responsibility for the Type Approval of the Product) and JAR 21 (Certification Procedures for Aircraft and Related Products and Parts). In this case, notification was accomplished using an All Operators Message, and was subsequently supported by a Notice To Operators.

RECOMMENDATION 98–05

The CAA should re-assess its response to Safety Recommendation 4.1 in AIB Aircraft Accident Report 1/81, 'Report on the Accident to BAe HS748 G-BEKF at Sumburgh Airport, Shetland Islands, on 31 July 1979', in the light of the subsequent occurrence of the accident to G-ATMI at Liverpool Airport on 16 August 1996, and other possible instances of inadvertent gust lock engagement on HS748 aircraft.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation.

Following the detailed reviews to be undertaken in response to AAIB Recommendations 97–49 and 97–50 of Aircraft Accident Report No 1/99, the Authority will reassess its response to Safety Recommendation 4.1 in AIB Aircraft Accident Report 1/81. This reassessment will consider all other relevant service history and it is intended that it will be completed by 30th September 1999.

Lockheed L188C Electra	**Nr Berlin (Schonefeld) Germany**	**30Jul96**	**Accident**

References: Bulletin 5/97 dated 8 May 97
FACTOR F18/97 dated 1 Jul 97

RECOMMENDATION 96–66

In order to prevent the freight doors on Lockheed L188 Electra freighter aircraft from opening in flight, as a result of failure to ensure correct latching of such doors before flight, the CAA should require that the following safety action is applied to all such aircraft on the UK register, and the FAA should require the same safety action for all other such aircraft worldwide:

1 An inspection to confirm that the 'cabin-doors unsafe' annunciator illuminates when the freight door is not in the closed and fully latched condition, and when all other cabin doors are in a fully safe condition.

2 An examination of any wiring diagrams or schematics of the door warning system in L188 Flight Manual supplements and Maintenance Manuals to confirm that they correctly represent the state of the wiring of the individual aircraft to which they apply, are in accordance with an FAA approved design and have been the subject of a design safety analysis.

3 The revision of the Electra 188C Operating Manual to identify any door(s) which are not monitored by the 'cabin-doors unsafe' annunciator once the above actions have been carried out.

4 Consideration be given to providing a clear physical warning, in addition to the existing locks unsafe light, of the absence of correct lock engagement, visible from outside of outward opening freight doors on L188 freighter aircraft.

Status – Partially Accepted – Open

CAA Response

The Authority partially accepts this Recommendation. Responses to the individual parts are as follows:

1 The Authority does not require the cargo door warning system to be connected to the cabin doors warning annunciator provided a dedicated cargo door annunciator is installed. However, a review of the warning system logic has indicated that not all UK registered aircraft incorporate acceptable cargo door unsafe warning systems due to possible dormant failure modes. The Authority intends to issue an Additional Airworthiness Directive by 31st August 1997, which will require Mandatory Action to ensure that all UK registered L188 Electra cargo aircraft incorporate acceptable unsafe warning systems. This Mandatory Action will address any need for periodic inspections of the cargo door warning systems.

2 The above Mandatory Action will also ensure that the applicable wiring diagrams, Flight Manual Supplement and Maintenance Manuals represent the state of wiring of the aircraft to which they apply. However, depending on the outcome of discussions that the Authority has initiated with FAA, those manuals may not necessarily be in accordance with an FAA approved design. Modifications which are found to be necessary will be the subject of a design safety analysis and will be approved by the Authority.

3 As a result of the above Mandatory Action, all doors whose failure to remain closed could hazard the aircraft will be monitored by an appropriate doors unsafe annunciator, the function of which will be reflected in the Aircraft Flight and Operational Manuals.

4 Current design requirements for doors do not require a 'clear physical warning' visible from the outside of the aircraft. The in-service experience of these doors supports this position. However, current requirements for outward opening doors require the installation of viewing ports, visible either from the inside or outside the aircraft to permit the locked/unlocked status of the door to be ascertained, but these are not considered to constitute a 'clear visible warning' and are normally used only for diagnostic purposes in the event of an unwanted unsafe door indication on the flight deck prior to flight.

The Authority intends to conduct further investigations of the L188 cargo doors by 31st August 1997 to determine whether design changes are required.

CAA Action

FAA have notified the Authority that following the investigation of the cargo door modification installed on the accident aircraft, they do not consider there to be an immediate need to take action to ensure the continued airworthiness of the aircraft. This is based on the fact that following withdrawal of the accident aircraft from service, FAA are only aware of one other similarly configured L188 and this is believed to be used as a water bomber. They did however acknowledge that a design review of all L188 cargo conversions was warranted but could not indicate when this would be carried out. The FAA is currently involved in a broad review of the cargo conversion of certain other major transport aircraft.

Following receipt of this information, the Authority notified UK operators of the L188 of its intention to mandate retrospective embodiment of means to ensure positive mechanical retention of cargo doors and a fail-safe system to warn the crew when this has not taken place. A date for the issuing of the associated Airworthiness Directive has yet to be agreed between operators and the Authority.

Fokker F27 MK500	**Belfast City Airport**	**4Aug95**	**Accident**

References: Bulletin 4/96 dated 1 Apr 96
FACTOR F14/96 dated 15 Aug 96

RECOMMENDATION 96–11

The CAA should review other Rolls Royce Dart powered turboprop aircraft to determine whether engine operating procedures require changing to minimise the risk of turbine 'burnout' as a result of propeller pitch lock malfunction.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

The CAA will undertake to complete a review of the available in-service data for other Rolls Royce Dart powered aircraft by 31 September 1996.

CAA Action

The Type Certificate holder for the Viscount 800 Series aircraft has informed the Authority that it wishes to withdraw its support for the type in accordance with BCAR Section A5. Whilst the Authority is investigating the status of the few aircraft that are potentially airworthy under BCAR A5-1 paragraph 1.2, it is likely that the Authority will agree with the manufacturer's position and withdraw the Type Certificate. As this would prevent any remaining examples of the type from holding a Certificate of Airworthiness in accordance with ICAO Annex 8, it is considered that the remaining action associated with AAIB Safety Recommendation 96–11 is no longer required.

Boeing B737-400	Nr Daventry	23Feb95	Incident

References: AIR 3/96 dated 25 Jul 96
FACTOR F18/96 dated 25 Jul 96

RECOMMENDATION 96–30

The CAA in conjunction with the JAA should review the requirements of JAR–145, relating to the monitoring of available manpower of maintenance organisations, to enable Authorities to retrospectively sample the availability of correctly qualified staff for the conduct of aircraft maintenance performed.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. The current JAR–145 requirement provides the basis whereby National Aviation Authorities can retrospectively sample the availability of correctly qualified staff. JAR–145.30(b) requires the Approved Maintenance Organisation to employ sufficient personnel to plan, perform, supervise and inspect the work. Access for monitoring by the Authority is enabled by JAR–145.90.

The Authority interprets JAR–145 such that the responsibility for day to day monitoring of compliance rests with the Accountable Manager of the JAR–145 Approval holder. Retrospective sampling is performed by the Authority's Aircraft Maintenance Standards Department (AMSD) survey staff in accordance with the Joint Aviation Authorities' (JAA) Administrative and Guidance Material Section 2: Maintenance, Part Two, Procedures. In the light of this Recommendation, the Authority will ask the JAA Maintenance Committee to review the adequacy and interpretation of the requirement. A Departmental Circular has been issued emphasising to AMSD survey staff the importance of monitoring, on a sampling basis, the availability of correctly qualified staff in maintenance organisations. Such monitoring processes are routinely reviewed in accordance with the AMSD Quality Management System.

CAA Action

Following a review of JAR–145, proposals drafted by the Authority to amend the current JAR–145 manpower advisory material have been published by the Joint Aviation Authorities (JAA) for consultation with all full member states. These proposals if adopted will amend Acceptable Means of Compliance 145.30(c) to advise those organisations approved in accordance with JAR–145 that manpower plans are to be reviewed on a regular basis and that records of planned and actual staff availability are to be maintained. The Authority's future position will be determined when the decision of Joint Aviation Authorities is made known.

RECOMMENDATION 96–31

The CAA, with the JAA, consider issuing advice to aircraft maintenance organisations that, where practical, work which can effect the (sic) airworthiness of an engine should not be conducted on all of the powerplant installations of an aircraft at one point in time by the same personnel.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. There is not a Joint Aviation Authorities' (JAA), nor has there ever been a UK, requirement to stagger maintenance work on powerplants and their installations. However, in 1986, CAP (Civil Aviation Publication) 513 Extended Range Twin Operations included a requirement that maintenance procedures should preclude identical action being applied to both engines or their installations at one point in time and by the same personnel. The Authority will consider, in consultation with industry, the potential safety benefits of issuing similar advice in respect of all multi-engined aircraft used for commercial air transport operations. The Authority will then ask the JAA Maintenance Committee to review the outcome of its considerations in the context of European applicability.

CAA Action

The Authority has issued advice, regarding the potential safety benefits where aspects of the Extended Range Twin Operations (ETOPS) maintenance philosophy are applied to multi-system aircraft. This advice published as Airworthiness Notice Number 72, dated 16 March 1998 has been issued to Aircraft Owners, Licensed Engineers and Organisations Approved under the Air Navigation Order. Additionally, Flight Operations Department Communication number 7/98, dated 16 March 1998, issued similar advice to holders of Air Operator Certificates.

Furthermore, proposals drafted by the Authority to amend the current Joint Aviation Requirement-145 (JAR–145) maintenance procedures advisory material have been published by the Joint Aviation Authorities (JAA) for consultation with all full member states. These proposals if adopted will amend Acceptable Means of Compliance 145.65 (b) to advise those organisations approved in accordance with JAR–145 to adopt procedures which are intended where practical to avoid the possibility of simultaneous incorrect maintenance on two or more safety critical systems.

RECOMMENDATION 96–33

The CAA, in conjunction with the JAA, review JAR–145 with a view to requiring a common standard of task documentation for Base and Line maintenance activity.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. The Authority accepts that common task documentation standards are good maintenance practice. The manufacturer's Maintenance Manual provides such a common standard for the performance of all tasks in both line and base maintenance. However, in practice operators have invariably required that their own document formats be used for recording line maintenance work on their aircraft. The Authority has seen this as an acceptable practice as it provides the operator with the means to control documentation and record standards whilst the aircraft itself travels from place to place, having – of necessity – work performed by various approved maintenance organisations. In the light of this Recommendation the Authority will ask the Joint Aviation Authorities' (JAA) Maintenance Committee to review the adequacy and implementation of JAR–145 and its associated guidance material in this respect.

CAA Action

Following a review of Joint Aviation Requirement–145 (JAR–145), proposals drafted by the Authority to require maintenance organisations to adopt common standard of task documentation for Base and Line maintenance have been published by the Joint Aviation Authorities (JAA) for consultation with all full member states. These proposals if adopted will amend JAR–145.45(e) to require those organisations approved in accordance with JAR–145 to provide common format task documentation for use throughout the organisation. The Authority's future position will be determined when the decision of Joint Aviation Authorities is made known.

RECOMMENDATION 96–35

The CAA, when conducting reviews of maintenance organisations for JAR–145 approval should monitor the work definition for maintenance supervisory staff and ensure that it avoids them undertaking tasks which are inconsistent with their managerial role.

Status – Partially Accepted – Open

CAA Response

The Authority partially accepts this Recommendation. The Authority's Aircraft Maintenance Standards Department (AMSD) survey staff already review, on a sampling basis, the duties and responsibilities of maintenance supervisory staff during their routine audits of maintenance organisations. The Authority believes that it is good maintenance practice and not inconsistent with their managerial role for managers/supervisors occasionally to perform maintenance tasks. This practice, which is widely adopted in the industry, enables them to remain current and to understand the day to day problems faced by their staff. It would, however, be inconsistent with their managerial responsibilities if managers/supervisors were to undertake tasks merely to make up shortfalls in shift manpower. Currently, there is no Joint Aviation Authorities' (JAA) requirement or guideline material which prohibits management/supervisory staff undertaking shop floor tasks. The Authority is preparing draft advisory material regarding the interpretation of the phrase 'good maintenance practices' which appears in JAR–145.65(a) to submit to the JAA Maintenance Committee. The draft material to achieve this and other aims will be completed by the Authority before the end of 1996. A Departmental Circular has been issued emphasising to AMSD survey staff the importance of monitoring, on a sampling basis, the availability of an appropriate number of correctly qualified staff. Such monitoring processes are routinely reviewed in accordance with the AMSD Quality Management System.

CAA Action

Following a review of Joint Aviation Requirement–145 (JAR–145), proposals drafted by the Authority to amend the current JAR–145 manpower advisory material have been published by the Joint Aviation Authorities (JAA) for consultation with all full member states. These proposals if adopted will amend Acceptable Means of Compliance 145.30 (d) to advise those organisations approved in accordance with JAR–145 that where supervisory staff carry out maintenance tasks, that such tasks should not be undertaken when incompatible with their management responsibilities. The Authority's future position will be determined when the decision of Joint Aviation Authorities is made known.

RECOMMENDATION 96–39

The CAA in conjunction with the JAA review JAR–145 to require, where aircraft maintenance or inspection tasks require elements of preparation for access, and incorrect restoration of these preparatory actions might result in airworthiness hazards, these restorative actions are individually defined to be signed as completed on the document which constitutes the Quality Assurance audit for airworthiness.

Status – Partially Accepted – Closed

CAA Response

The Authority partially accepts this Recommendation. JAR–145.50 requires the issue of a Certificate of Release to Service on completion of all required tasks. Traditionally, 'stage inspection' sheets or 'task cards', used by many maintenance organisations, underpin the issue of the Certificate in respect of all maintenance tasks, including those that might result in airworthiness hazards. In view of the importance of identifying significant stages in the completion of tasks, the Authority will ask the Joint Aviation Authorities' (JAA) Maintenance Committee to review the adequacy and implementation of the JAR–145 requirement and its associated guidance material in this respect.

Quality Assurance audits for airworthiness are quite properly conducted independently of the Certificate of Release to Service process and are normally conducted retrospectively, on a sampling basis by the JAR–145 maintenance organisation.

CAA Action

Following the accident the Authority issued advice, regarding the airworthiness hazards that might result where non-scheduled maintenance tasks of a complex nature are insufficiently documented. This advice was published as Appendix 53 to Airworthiness Notice 12. Additionally, the Aircraft Maintenance Standards Department (AMSD) published a Departmental Circular emphasising to AMSD survey staff the importance of monitoring the adequacy of maintenance process sheets where complex maintenance actions are needed.

Furthermore, following a review of Joint Aviation Requirement–145 (JAR–145), proposals drafted by the Authority to advise maintenance organisations of the benefits in providing task documentation which separates complex tasks into a number of discrete steps have been published by the Joint Aviation Authorities (JAA) for consultation with all full member states. These proposals if adopted will amend JAR–145.45(e) to advise those organisations approved in accordance with JAR–145 to provide task documentation for complex tasks simplified by breaking each task down into a number of discrete steps.

RECOMMENDATION 96–42

The CAA review what they have heretofore regarded as acceptable arrangements for Quality Assurance to meet the requirements of the regulations currently governing the conduct of aircraft maintenance within the UK, with the intent of ensuring that airworthiness is not compromised. This initiative has international significance and the CAA is urged to enlist support from the other JAA Authorities and the FAA in this comprehensive re-appraisal of aircraft maintenance practices.

Status – Partially Accepted – Open

CAA Response

The Authority partially accepts this Recommendation. A comprehensive re-appraisal, between the States comprising the Joint Aviation Authorities (JAA); industry associations; and the US Federal Aviation Administration (FAA), of all aviation regulations, including those applying to aircraft maintenance, was initiated with the formation of the JAA in Europe. One of the main features that emerged in the maintenance field was the importance of an effective and independent Quality Assurance System such as that which had been required by British Civil Airworthiness Requirements for over 20 years. The requirement for such a system was therefore introduced into JAR–145, the new primary regulation for aircraft maintenance.

JAR–145 was the first operational JAA requirement to be adopted in 1992 and has been subject to four amendments to date. It would now be timely to review the effectiveness of the new regulatory regime in the field of aircraft maintenance in the UK. A small team will be constituted to conduct such a review and to report its conclusions. The findings will be brought to the attention of the JAA if it is considered that there would be benefits from so doing. The development of aviation regulations, including those applying to aircraft maintenance, is a continuous process in which the UK CAA plays a major role. Through its actions in respect of the other Recommendations made in the AAIB Report into the subject incident, the Authority will play its part in further improving the requirements and regulations governing the conduct of aircraft maintenance within the JAA States.

CAA Action

Following a review of the Quality Assurance arrangements within Joint Aviation Requirement–145 (JAR–145), the Authority submitted a Notice of Proposed Amendment to JAR–145 which has been published by the Joint Aviation Authorities (JAA) for consultation with all full member states. These proposals have been formulated to improve the effectiveness of JAR–145 quality assurance arrangements. The Authority's future position will be determined when the decision of Joint Aviation Authorities is made known.

Boeing B737-2D6C	**Willenhall, Coventry**	**21Dec94**	**Accident**

References: AAR 1/96 dated 7 Dec 95
FACTOR F1/96 dated 10 Jan 96

RECOMMENDATION 95–22

The CAA should ensure that weather reporting at UK airfields used for Public Transport aircraft operations be made at half hourly intervals, and disseminated accordingly.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. A review will be conducted with a view to rationalising all references and meteorological standards in the existing regulatory

documentation. For UK airfields where public transport operations are being conducted, an appropriate requirement will be introduced to require that weather observations are made at a minimum of half hourly intervals and the reports disseminated accordingly. The target date for the introduction of the requirement is the end of June 1996.

CAA Action

A draft set of safety requirements, which include the requirement for half hourly observations, has been compiled and is currently being placed through the consultation process. Subject to satisfactory completion of that process, the requirements are expected to be published by autumn 1999. In the meantime, the Authority's recommendation to all aerodrome licensees and air traffic control service providers to ensure that their procedures for the observation and dissemination of meteorological information meet the needs of operators and public transport flights at their respective airfields remains current.

RECOMMENDATION 95–23

The CAA should examine the post-qualification training and supervision of newly qualified Meteorological Observers to ensure that this is adequately carried out.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. The requirements and guidance in relation to the post-qualification training and supervision of newly qualified Meteorological Observers will be reviewed in conjunction with the Meteorological Office.

CAA Action

The Authority continues to work with the Met Authority in the development of a post-qualification training regime for aviation Meteorological Observers although details cannot be finalised until the Requirements referred to in the update to Recommendation 95–22 are complete.

Cessna 550 Citation II	**Southampton Eastleigh Airport**	**26May93**	**Accident**

References: AAR 5/94 dated 12 Jul 94
FACTOR F17/94 dated 12 Jul 94

RECOMMENDATION 94–15

The CAA should review all UK licensed airfields to identify potential safety hazards beyond current RESAs and determine the need for, and practicality of installing, ground arrester systems.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The Authority's licensing process seeks to ensure that all UK licensed aerodromes satisfy internationally agreed requirements. However, the Authority will conduct a specific review on the lines recommended. This will reconsider the dimensions of the RESA (Runway End Safety Area) and take account of any identifiable additional risks arising from significant hazards beyond the end of the RESAs.

CAA Action

The CAA published, in October 1998, guidance for aerodrome licensees on the identification of hazards, the quantification of risks, options for the reduction of those risks, including the provision of enhanced Runway End Safety Area (RESA), and information on arrester beds.

Boeing 737-236	**Manchester Airport**	**22Aug85**	**Accident**

References: AAR 8/88 dated 15 Dec 88
FACTOR F5/89 dated 13 Mar 89

RECOMMENDATION 4.20

The balance of effort in aircraft fire research should be restored by increased effort directed towards fire hardening of the hull, the limitation of fire transmission through the structure and the prevention of structural collapse in critical areas. Short term measures should be devised for application to existing types but, in the long term, fire criteria should form a part of international airworthiness requirements.

Status – Fully Accepted – Open

CAA Response

The Authority whilst agreeing the case for considering fire hardening of the structure has some reservations on the proposed change in the balance of research work. The CAA is aware of current FAA research studies, addressing both the ability of existing aircraft fuselage skins to resist penetration in a ground fire condition and the behaviour of fires within remote aircraft compartments, i.e. hidden fires. When results of this research become available, and have been reviewed, the Authority will determine what, if any, new requirements are necessary. It should be noted that the capability of water sprays, in limiting fire transmission through the structure, will be included in such a review.

CAA Action

The Authority's activity within the European Consortium formed to examine this issue has been redirected in response to an FAA initiative to issue a Notice of Proposed Rulemaking (NPRM). This will introduce both flammability and burn through standards for thermal acoustic insulation materials used on transport aircraft. Work both in the US and in the UK has concluded that the only method of improving burn through resistance is by the use of

suitable insulation materials. The Authority has been active in the relevant technical discussions. Testing under CAA funding at the medium scale test facility at Darchem Flare in Darlington has been instrumental in demonstrating that the correct method of installation, as well as the correct insulation material, is essential if the necessary benefits are to be achieved. The current phase of testing has been organised to enable timely inputs commensurate with the expected date of issue of the NPRM – June 1999. Further work will depend upon the wording of that Rule.

Part 2 – AAIB Recommendations relating to all Rotorcraft

Montgomerie Bensen B8MR	**Coll, Isle of Lewis**	**13Jun98**	**Accident**

References: Bulletin 10/98 dated 12 Oct 98
FACTOR F24/98 dated 23 Nov 98

RECOMMENDATION 98–56

In order to avoid fuel leakage problems from PVC tubing due to associated shrinkage and embrittlement in service the CAA, in conjunction with the Popular Flying Association, should require replacement of such tubing, where fitted, with alternative tubing manufactured from identifiable material of a type suitable for use in aircraft fuel systems; in addition, the CAA should consider whether wider action on this problem is required.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The Authority will publish, by 30th November 1998, a Mandatory Permit Directive(MPD) covering all affected aircraft which will require within 15 hours flying time, or 3 months whichever occurs first, an inspection of all fuel tubing for shrinkage, degradation and embrittlement. The MPD will require defective tubing to be replaced with alternative tubing, manufactured from identifiable material of a type suitable for use in aircraft fuel systems. The MPD will also require all PVC tubing, regardless of condition, to be replaced with alternative suitable material by the next Permit to Fly renewal.

Furthermore, the Authority will bring to the attention of the General Aviation community both the problems associated with the use of PVC fuel tubing in aircraft fuel systems, and the existence of the MPD, in the next edition of the General Aviation Safety Information Leaflet (GASIL). The Authority has also asked the PFA and the British Microlight Aircraft Association to notify their Inspectors and members of the existence of the MPD.

CAA Action

The Authority published a Mandatory Permit Directive (MPD) on 1 March 1999 requiring the inspection of all permit light aircraft below 2730 kg and replacement of PVC fuel tubes with a suitable alternative. In addition, the Authority published an article in the February 1999 edition of the General Aviation Safety Information Leaflet (GASIL) which highlighted the problems associated with the use of PVC fuel tubing in aircraft fuel systems, and also the existence of the MPD.

Sikorsky S61	Bressay, Shetland Islands	19Nov97	Accident

References: Bulletin 4/98 dated 16 Apr 98
FACTOR F15/98 dated 1 Jun 98

RECOMMENDATION 98–30

It is recommended that the operator, in conjunction with HM Coastguard and the CAA, urgently address the feasibility of radio communication between the winchman and the helicopter, and that the CAA should require the operator to address the communication between the winchman and the operator within the operations Manual.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. The Authority, in conjunction with HM Coastguard, is assisting the operator in urgently addressing the feasibility of radio communication between winchmen and their helicopters. In addition, the Authority will require the operator to address within the Operations Manual communications between the winchman and the winch operator. The target date for completion of both items is 31st December 1998.

CAA Action

An interim solution involving a waterproof radio has been in use since September 1998. A modification to improve the system is to be trialled. If successful it should meet the long term objectives of the helicopter operator and the Coastguard.

In parallel to this, a research project has been established to investigate new technology and its suitability for use in this area.

SA341 Gazelle 1	Gamston Airfield	28Jul97	Accident

References: Bulletin 2/98 dated 11 Feb 98
FACTOR F11/98 dated 2 Apr 98

RECOMMENDATION 97–62

It is recommended that the CAA reconsider the type-rating training requirements for the Gazelle to determine whether additional emphasis needs to be placed on yaw control during take off, landing and low speed manoeuvres.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

Following consultation with representatives from the helicopter industry, the Authority introduced, with effect from 1 October 1995, recognised type conversion training courses for private pilot licence (helicopter) holders and all professional pilot licence (helicopter) holders who wish to include an additional helicopter type rating on their licence. The requirement details were promulgated in AIC 77/1995 (White 221) 24 August 1995.

Compliance with Recommendation 97–62 will be achieved by ensuring that all applications for Gazelle type conversion courses include appropriate emphasis on yaw control during take-off, landing and low speed manoeuvres. The sole provider of Gazelle type conversion courses has amended the syllabus and has already contacted all previous course students to emphasise the matter.

RECOMMENDATION 97–63

It is recommended that the CAA review the Approved Flight Manual for the Gazelle to determine whether the advice regarding uncontrolled yaw breakaway should be amended in the light of the MOD trial results.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation

Current AFM procedures, as modified by CAA Change Sheet No 1, specify that an uncontrolled yaw breakaway should be treated as a tail rotor failure, and if this occurs in the hover, the collective lever should be lowered immediately, accepting the inevitable heavy landing.

The Authority has reviewed these procedures, particularly in association with those detailed in the military Gazelle Aircrew Manual, and has concluded that the existing (civil) Approved Flight Manual procedures provide the best advice in difficult circumstances.

Agusta Bell 206B Jetranger	**Ledbury, Herefordshire**	**16Dec96**	**Accident**

References: Bulletin 9/97 dated 9 Sep 97
FACTOR F30/97 dated 17 Nov 97

RECOMMENDATION 97–22

The CAA should re-examine the recommendation made as a result of the accident to Agusta A109 helicopter, which occurred on 27 June 1990 with a view to producing guidance material, such as a Code of Conduct, for Corporate helicopter operators which should take

into account all those aspects of public transport operations referred to in the Air Navigation (No 2) Order which are appropriate to a minimum safety standard for corporate operators.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The Authority, with the participation of the British Helicopter Advisory Board, will, by May 1998, produce guidance material, such as a Code of Conduct, for corporate helicopter operators which will take into account those aspects of public transport operations which are appropriate to a minimum safety standard for corporate operators.

CAA Action

Civil Aviation Publication (CAP) 686 – 'Corporate Code of Practice (Helicopters)' was published by the Authority in July 1998.

AS355F1 Twin Squirrel	**Middlewich, Cheshire**	**22Oct96**	**Accident**

References: AAR 4/97 dated 27 Nov 97
FACTOR F35/97 dated 27 Nov 97

RECOMMENDATION 97–54

The requirements of the following JAR–OPS 3 regulations, as formulated in the original 22.5.95 edition, should be adopted by the UK as soon as practicable:

a Paragraph 3.652
b Paragraph 3.655
c Sub paragraph (b)(1) of Paragraph 3.940
d Sub paragraph (a)(2) of Appendix 1 to Paragraph 3.940
e Paragraph 3.950

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. The Authority will seek to implement, within the UK, those requirements listed in the Recommendation, as soon as possible and in any event before the introduction of JAR–OPS3 which is presently planned for October 1998.

CAA Action

There is currently no date set for JAR–OPS 3 to be annexed to EC Regulation 3922/91 thereby becoming law throughout the European Community. The Authority has therefore decided to seek amendment of the Air Navigation Order in order to address this Recommendation. Target date for a Letter of Consultation – August 1999.

AS332L Super Puma	**22nm South Buchan Oil Platform**	**27Sep95**	**Incident**

References: 2/98 dated 2 Apr 98
FACTOR F9/98 dated 2 Apr 98

RECOMMENDATION 98–07

The CAA, in conjunction with North Sea operators, should review the integrity of helicopter Public Address systems and determine the most satisfactory way of significantly improving the reliability of such systems in conditions of severe vibration.

Status – Partially Accepted – Open

CAA Response

The Authority partially accepts this Recommendation. The Authority will undertake a review, in conjunction with North Sea operators, of the installation of the Public Address systems in the AS332L helicopter, to determine whether modifications are necessary to provide a satisfactory performance in expected vibration conditions. It is intended to complete this review by 30 September 1998. The Authority does not consider that the incident indicates the need for a further review of PA system installations in other helicopter types.

CAA Action

The Authority has continued its discussions with the operators of this helicopter type and the Passenger Address (PA) amplifier manufacturer in an effort to identify and rectify the cause of the failure experienced in this incident. During these discussions, the manufacturer of the PA system amplifier confirmed that the internal capacitor which broke loose during the incident should have been fastened by two Tye wraps. When the PA amplifier was inspected these Tye wraps were not present and the seal label on the PA case had been broken previously. The Authority believes that the absence of Tye wraps contributed to the failure of the PA system amplifier and the non-replacement of the seal label is indicative of unauthorised maintenance.

On balance the Authority concludes that the PA system failure was an isolated example caused primarily by the failure, due to lightning strike, of a non-compliant tail rotor blade. The PA amplifier failure under the subsequent severe vibration conditions was exacerbated by the absence of Tye wraps on the internal capacitor. The primary cause of the incident has been addressed already and rectified by mandatory improvements to the tail rotor blade lightning protection. Under these circumstances the Authority does not intend to take any further design action in response to this Safety recommendation. However, the potential use of unauthorised maintenance practices is being pursued with the operator.

RECOMMENDATION 98–08

The CAA should review, with associated helicopter operators and manufacturers, the function and trigger thresholds of the ground based IHUMS software with the aim of introducing procedures which will be able, routinely and without substantial operator intervention, to highlight adverse trends.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. The Authority will review with operators and manufacturers the outputs of the ground based HUMS software, and will consider the introduction of procedures that will facilitate the identification of adverse trends. It is intended to complete this review by 31 December 1999.

RECOMMENDATION 98–09

The CAA should consider means by which ready access could be provided to fleetwide trend data which would identify abnormal trends on a particular aircraft against an operator's whole fleet.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. The Authority will review means by which ready access could be provided to fleetwide trend data which would identify abnormal trends on a particular aircraft against an operator's whole fleet. It is intended that this review will be completed by 31 December 1999.

RECOMMENDATION 98–10

In order to maximise the effectiveness of HUMS through proper integration with the maintenance programmes of existing helicopter types, the CAA should require all group A helicopter types on the UK register to be subject to evaluation against the latest BCAR/JAR rotor and transmission Design Assessment requirements.

Status – Not Accepted – Closed

CAA Response

The Authority does not accept this Recommendation.

HUMS, if applied retrospectively as a result of Design Assessment requirements, has not yet been shown to be technically feasible or economically justified for all types of Group A helicopters.

However, since the publication of the Helicopter Airworthiness Review Panel (HARP) report in 1984, both the Authority and UK industry have invested considerable resources in the research and development of HUMS. HUMS currently installed in helicopters on the UK register have been designed without the benefit of rotor and transmission design assessments. Nevertheless, the Authority is convinced that these existing HUMS installations are capable of providing significant safety benefits.

Accordingly, the Authority will consult with North Sea Operators and then decide the extent to which the fitment and use of HUMS should be made mandatory. It is intended that this consultation will be completed by 30 September 1998.

RECOMMENDATION 98–11

In order to utilise the data available from IHUMS systems on board Public Transport helicopters to maximum effect to avoid serious accidents, the CAA should develop the concept of providing flight deck display of IHUMS exceedance information, including vibration, to flight crew as previously proposed in CAA HARP (CAP491) of June 1984.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. At the Authority's request, the Helicopter Health Monitoring Advisory Group has formed a Working Group to assist with developing the concept of a flight deck display of Integrated Health and Usage Monitoring Systems (IHUMS) exceedance information, including vibration. It is intended that this Group will present its findings by 31 December 1998.

CAA Action

The Report of the Working Group, formed by the Helicopter Health Monitoring Advisory Group to assist with the concept of a flight deck display of IHUMS exceedance information including vibration, is expected to be provided to the Authority in June 1999. The Authority will then review the feasibility and desirability of providing a flight deck display of HUMS information.

Sikorsky S61N	**Claymore Accom platform, N Sea**	**18Aug95**	**Accident**

References: Bulletin 3/96 dated 1 Mar 96
FACTOR F17/96 dated 15 Jul 96

RECOMMENDATION 96–01

The CAA jointly with the Health and Safety Executive (Offshore Safety Division) and representatives of the oil industry, should together consider the need to commission research, into the effects that wind flow, turbine exhaust and flare exhaust emissions have on the helidecks of installations that are positioned adjacent and in close proximity to one another. This research should concentrate initially on the CAP/CPP installation and should be applied to other combined installations already commissioned or about to enter service.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. A preliminary study, to be instigated by December 1996, will establish the nature and extent of the environmental problems

associated with operating to helidecks on off-shore platforms. In addition, the techniques and technology that could be deployed to manage, where practicable, the effects of these environmental problems will be reviewed. The purpose of this study will be to provide CAA, HSE and the oil industry with the information needed to plan a course of short, medium and long term measures to address the issues highlighted by this incident.

CAA Action

Work started on the project in July 1997 under joint Civil Aviation Authority/Health and Safety Executive (Offshore Safety Division) funding. Work has been completed and a final report is due to be published in the form of a Civil Aviation Authority Paper. Three initiatives have been instigated in response to the conclusions and recommendations of this research;

1 A study of the effects of turbulence on helicopters and the development of a Turbulence Criterion for inclusion in Civil Air Publication 437, Offshore Helicopter Landing Areas – Guidance on Standards;

2 Wind tunnel testing of the Claymore complex to establish the probable modification to ambient conditions, caused by gas turbine exhausts and/or the flare, at the time of the accident and

3 A feasibility study for the trial of gas turbine exhaust visualisation techniques.

AS350 Squirrel	**Lochgilphead**	**5May95 Accident**

References: AAR 4/96 dated 29 Aug 96
FACTOR F21/96 dated 29 Aug 96

RECOMMENDATION 96–58

It has been recommended that the CAA, in conjunction with the DGAC, should require reassessment of the crashworthiness of the AS350 forward seat and its floor attachments, including consideration of seat rail reinforcement, relevant aspects of the helicopter bottom structure strength and floor mounting of the shoulder strap inertia reel, with the aim of preventing seat detachment from the floor in a survivable impact. A similar assessment should be made for the AS355 helicopter which has an identical seat.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

The Authority has approached DGAC(F) with the intention of jointly carrying out the recommended review.

CAA Action

In December 1998 DGAC-France notified the Authority that they had completed the reassessment review of crashworthiness for the AS350. Modifications of the seat attachment to the floor are underway for both in-service and new production aircraft. These modifications will be available mid 1999.

Schweizer 269C	**Oxford Kidlington Airport**	**27Mar95**	**Accident**

References: Bulletin 8/95
FACTOR F17/95 dated 27 Nov 95

RECOMMENDATION 95–12

It is recommended that for UK registered Schweizer 269 helicopters, to prevent overboard release of fuel after an accident where the helicopter comes to rest on its side but the fuel system remains undamaged, the CAA consider the need for:

1 Reconfiguration of the fuel tank vent system to prevent fuel release through the vent outlet.

2 Measures aimed at ensuring the integrity of fuel tank filler cap seals.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation.

1 The Authority is actively pursuing modification of the vent system with the helicopter manufacturer.

2 The Authority considers that the design of the present filler cap is adequate, however, the maintenance inspection instructions are being reviewed.

CAA Action

The manufacturer has agreed with the Authority that they will provide a modification to the fuel vent system that will preclude the release of fuel in the event of roll-over on the ground. They have confirmed that the system design has been completed and that certification will be accomplished in conjunction with certification of a revised fuel tank system for this model of helicopter which is scheduled to be completed by 30 September 1999.

Once certificated, the modification will be mandated by the Authority for UK Registered Schweizer 269 helicopters.

AS332L Super Puma	**Nr BRAE'A'Platform, N Sea**	**19Jan95**	**Accident**

References: 2/97 dated 9 Sep 97
FACTOR F28/97 dated 9 Sep 97

RECOMMENDATION 97–32

In order to prevent the premature cessation of electrical power supply to helicopter combined voice/flight data recorders (CFDRs) caused by abnormal excessive vibration effects on associated 'G' switches, it is recommended that the CAA:

1 require operators to render inoperative CVFDR 'G' switches, as an interim measure, and

2 take action to identify a more suitable method of stopping such flight recorders during crash impact.

Status – Fully Accepted – Open

CAA Response

The Authority accepts the intent of this Recommendation. However, requiring operators to render inoperative CVFDR G' switches in existing installations where they are powered from the aircraft batteries may allow these recorders to continue running after a crash impact, thereby erasing pre-impact data.

Current operating requirements and corresponding Minimum Operation Performance Specifications for FDR and CVR Systems (ED55 and ED56A) already identify other more suitable means of stopping flight recorders after accidents, although the use of 'G' switches is not prohibited.

The Authority, therefore, will review the CVFDR installations to determine the need for and the practicality of providing alternative means of stopping flight recorders, before taking any specific action. This review will be completed by 31st December 1997.

CAA Action

Discussion of the two elements of this Recommendation continues in EUROCAE Working Group 50 (WG 50). WG 50 is also considering data from later accidents and this has delayed the resolution of the issue. The conclusions of WG 50 are now expected to be published by 31 March 2000.

AS332L Super Puma	Gryphon 'A' Platform, N Sea	22Dec93	Incident

References: Bulletin 6/94 dated 8 Jun 94
FACTOR F21/94 dated 5 Oct 94

RECOMMENDATION 94–20

It is recommended that the airworthiness authorities ensure that future certification of engine/airframe intake combinations includes testing throughout the critical temperature range described in paragraph 6.4.1.9B of the AGARD Advisory Report No 223 in representative conditions of falling and recirculating snow.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The Authority will initiate the appropriate procedures within the JAA with a view to ensuring that the certification requirements include testing throughout the critical temperature range described in paragraph 6.4.1.9B of the AGARD Advisory Report No 223 in representative conditions of falling and recirculating snow.

CAA Action

The proposed changes to the requirements for testing in snow conditions developed by the Authority following its discussions with DERA and a major helicopter manufacturer have been considered by the appropriate JAA/FAA Harmonisation Group. Resulting from this action the Authority has been advised that as the relevant guidance material is published by the FAA in the form of an Advisory Circular, the correct approach should be for the proposed changes to be addressed directly to the FAA. This advice has been accepted and proposals for amendments to FAA AC 29-2 (Certification of Transport Category Rotorcraft) were submitted to the FAA in April 1999.

Bell 206; Tornado	Nr Kendal	23Jun93	Accident

References: AAR 2/94 dated 5 May 94
FACTOR F15/94 dated 7 Jun 94

RECOMMENDATION 94–04

The Ministry of Defence should give a high priority to the development and introduction of technology which provides low flying military FJs with an aircraft collision warning system and the CAA should give similar priority to the research project for an electronic strobe detector.

Status – Fully Accepted – Open

CAA Response

The first part of this Recommendation is addressed to the Ministry of Defence. The Authority accepts the second part of this Recommendation. A feasibility study to investigate the electronic detection of aircraft strobe lights was completed for the Authority in 1993. The results indicated that the technique was practicable and with modern electronic components a functional system might be constructed with a size and cost that would likely to be acceptable for installation on light aircraft and helicopters. The Authority has commissioned a study with a leading systems development consultancy with advice from airborne electroptics specialists from the Defence Research Agency at Farnborough. The study will make ground and airborne practical measurements to confirm the theoretical predictions made in the feasibility study. A report will be available in late 1994.

CAA Action

Discussions are continuing with potential manufacturers of the detection system. However, the RAF has yet to make a decision on fitment to any of its aircraft.

AS355 Twin Squirrel	**Nr Liverpool**	**6Jan93**	**Accident**

References: Bulletin 5/93
FACTOR F26/93 dated 3 Dec 93

RECOMMENDATION 93–37

Require for UK registered AS350 and AS355 helicopters, the fitment of a system to provide unmistakable cockpit indication to the pilot of improperly latched engine or MGB bay doors.

Status – Partially Accepted – Open

CAA Response

The Authority rejects this Recommendation as written in that it dictates a specific design solution which may not in airworthiness terms be the optimum answer to the problem. However the intent of the Recommendation is accepted in that improved indication of improperly latched engine or MGB bay doors is necessary. To this end the manufacturer in co-operation with the type certification authority (DGAC France) is currently examining ways and means of achieving such an improvement and plan to have the design of a suitable indication system certificated towards the end of 1993. When such a system is available DGAC France will be consulted on the need for airworthiness directive action.

CAA Action

The Authority has consulted with the operators, and as a result is not convinced that the manufacturer's service bulletin is the correct solution to the problem. In conjunction with the operators the Authority now intends to seek a locally produced solution, by 30th September 1999. The Authority will keep EC(F) and DGAC(F) informed of progress.

AS332L Super Puma	Cormorant Alpha, N Sea	14Mar92	Accident

References: AAR 2/93 dated 27 May 93
FACTOR F14/93 dated 27 May 93

RECOMMENDATION 93–22

The current study within the CAA on the subject of cockpit workload should be given a high priority with a view to reducing the workload, in particular administrative matters, of flight crews whilst airborne or engaged in the shuttling task. Meanwhile, standard operating procedures should ensure that flight administration and flight planning must be completed, so far as is practical, before each movement takes place.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. Problems with cockpit workload in this type of operation have already been identified by the Authority and a feasibility study into the use of an aircraft mounted electronic flight planning aid is in hand. The Authority will also review standard operating procedures.

CAA Action

The Helicopter Management Liaison Committee sub-group has made its recommendations to the full committee and they have been accepted. The recommendations were presented to a joint oil company/helicopter operator/CAA group (the Helicopter Safety Steering Group) in May 1999 and gained their support. Helicopter operators' Operations Manuals will be suitably amended with effect from 1st August 1999.

RECOMMENDATION 93–26

The CAA should consider amending certification requirements for public transport helicopters operating over the sea to include a suitable system for manual and automatic inflation of emergency hull flotation equipment and that this requirement should also apply to helicopter types currently in service.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation. A comparison will be made of the safety benefits and disadvantages which are likely to arise if automatically inflatable flotation equipment was to be installed on a helicopter. If a nett safety benefit is established then changes to the relevant airworthiness requirements will be proposed.

CAA Action

Due to difficulties encountered with computer modelling of helicopter water impact scenarios, the Authority sponsored research into the crashworthiness of helicopter emergency flotation systems will not be completed until mid-1999. The first meeting of the

JAA/FAA/Industry working group to review helicopter water impact, ditching design and crashworthiness took place in October 1998. The results of the research will be presented to the group which will then consider the most effective ways of improving occupant survivability following ditching or water impact.

Part 3 – AAIB Recommendations relating to Aeroplanes below 5700kg MTWA and Others, (e.g. Balloons)

Kolb Twinstar MKIII	**Near Louth, Lincolnshire**	**26Jul98**	**Accident**

References: Bulletin 12/98 dated 10 Dec 98
FACTOR F6/99 dated 1 Mar 99

RECOMMENDATION 98–62

This accident may have resulted from a loss of control by the pilot. The pilot had no training and limited experience on the type of aircraft control system that he was using. Given the fundamental differences between weight shift and 3-axis control systems, notably the diametrically opposed control movements for pitch and roll, it is recommended that the CAA should consider making the guidance contained in CAP53, Chapter 2 paragraph 2.2 and Chapter 1 paragraph 2.2, a mandatory requirement.

Status – Not Accepted – Closed

CAA Response

The Authority does not accept this Recommendation.

Having read the AAIB report, the initial view of the Authority was that Alternate Control System training should be made mandatory for pilots of microlight aeroplanes converting from weight-shift to 3-axis control or vice-versa. However, further examination of the pilot's flying experience by the Authority has shown that the pilot had demonstrated that he was fully competent with the control of the aircraft throughout its flight envelope. The Authority has therefore concluded that mandating the guidance contained in CAP53 Chapter 2 paragraph 2.2 and Chapter 1 paragraph 2.2 is not justified.

Piper PA28-161	**1.35nm South of Bournemouth**	**6Nov97**	**Accident**

References: Bulletin 2/98 dated 11 Feb 98
FACTOR F10/98 dated 2 Apr 98

RECOMMENDATION 98–01

The CAA Medical Branch should explore suitable methods whereby AMEs have available the best possible medical history of an applicant for the initial issue of an Aviation Medical Certificate.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

The Authority has already considered methods of obtaining a more reliable medical history of an applicant for a medical certificate, but has been unable to identify one which would be consistently effective.

However, it will again review the options, and seek the views of the members of the Joint Aviation Authorities Flight Crew Licensing Medical Sub-Committee. The Authority anticipates being able to complete the review by September 1998.

CAA Action

The views of the members of the Joint Aviation Authorities Flight Crew Licensing Medical Sub-Committee were sought on this issue and, because of the very varied nature of general practice support throughout Europe, no harmonised agreed position could be reached whereby it was mandatory for medical histories and information to be sought from an applicant's general practitioner. Similar problems were stated as apply in UK, in that not all individuals are registered with a general practitioner and individuals who are determined to non disclose can easily seek treatment from a private practitioner and keep the matter separate to their general practitioner's records. Consequently, the Medical Sub-Committee was of the opinion that no change to the JAA application form for a medical certificate could satisfy this recommendation.

Robin HR200	**Comartry Gap, Nigg Bay**	**29Oct97**	**Accident**

References: Bulletin 6/98 dated 11 Jun 98
FACTOR F22/98 dated 20 Oct 98

RECOMMENDATION 98–34

The CAA should introduce a requirement for the carriage and wearing of suitable types of lifejackets by the occupants of General Aviation aircraft which have Certificates of Airworthiness in the Publlic Transport Category, especially those used for training, whilst conducting flights, wholly or partly, over the sea.

Status – Partially Accepted – Open

CAA Response

The Authority accepts the principle of this Recommendation. The Authority will develop proposals for legislation that will require the carriage and wearing of suitable lifejackets by the occupants of a United Kingdom registered aircraft, flying for purposes other than public transport, when flying over water below such an altitude as would enable the aircraft:

(a) if it has one engine only, in the event of the failure of that engine : or

(b) if it has more than one engine, in the event of the failure of one of those engines and with the remaining engine or engines operating within the maximum continuous power conditions specified in the certificate of airworthiness relating to the aircraft.

to reach a place at which it can safely land.

The Authority intends to consult, in accordance with Government requirements, before imposing any legislative change.

CAA Action

The Authority is considering the need for legislation that will require the carriage and wearing of lifejackets by the occupants of United Kingdom registered aircraft, flying for purposes other than public transport, when flying over water below such an altitude as would enable the aircraft, in the event of an engine failure, to reach a place where it can safely land. Extensive internal consultation within the Authority has been carried out and past records reviewed. The Authority will seek the views of the General Aviation Consultative Committee before proceeding further.

DH82a Tiger Moth	**Cardiff Airport**	**20Aug97**	**Accident**

References: Bulletin 6/98 dated 11 Jun 98
FACTOR F19/98 dated 1 Aug 98

RECOMMENDATION 98–40

In order to avoid unnecessary injury to the occupants of vintage aircraft during accidents, and since most Sutton harnesses currently fitted to such aircraft in service are likely to be in a deteriorated condition, it is recommended that all affected aircraft, including the de Havilland Moth series, be the subject of mandatory action by the CAA to equip them with improved modern harnesses.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation.

The Authority will require the aircraft Type Design Organisation to issue a Service Bulletin requiring the fitting of either life-limited Sutton harnesses or new improved modern harnesses for all affected de Havilland aircraft, and this will be made mandatory by the Authority. It is intended that this will be completed by 31st December 1998. For other affected aircraft types, for which the manufacturers may no longer exist, it is intended that these actions will be completed by 31st December 1999.

CAA Action

The Type Certificate holder has issued a Technical News Sheet TNS CT (Moth) No 33 which introduces a mandatory examination of the front and rear cockpit harnesses, repeat examinations, and requires replacement of existing items within 150 hrs/3 years. The TNS also introduces a 9-year life for new Sutton-type harnesses. This TNS has been mandated by the Authority. In addition, the TNS strongly recommends that owners or operators consider fitting their aircraft with a harness of improved design made from modern materials.

For other affected types, for which the manufacturers may no longer exist, it is intended to introduce a similar Service Bulletin, this action is scheduled for completion by 31 December 1999.

RECOMMENDATION 98–41

It is recommended that the CAA, in conjunction with the Type Design Organisation for the DH82A Tiger Moth, make available a mandatory modification which ensures that the associated fuel cock linkage resists any tendency to displace due to engine vibration and remains in the ON position, unless otherwise selected OFF.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

The Authority will require the Type Design Organisation for the DH82A Tiger Moth series to make available a modification to ensure that the associated fuel cock linkage resists any tendency to displace due to engine vibration and remains in the ON position unless selected OFF. When available, this will be made mandatory by the Authority. It is intended to complete these actions by 31st December 1998.

CAA Action

The Type Certificate holder has issued a Technical News Sheet TNS CT (Moth) No 34 (applicable to all DH82 series aircraft) which introduces a fuel cock selector detent that ensures that the fuel selector remains in the ON position unless selected OFF. This has been mandated by the Authority.

Cameron A-210 Balloon	**North Ferriby, Humberside**	**20Jul97**	**Accident**

References: Bulletin 3/98 dated 11 Mar 98
FACTOR F14/98 dated 1 Jun 98

RECOMMENDATION 98–21

It is recommended that the CAA consider the requirement for the provision of lifejackets for the occupants of balloons which, although within the region of operation, spend a significant part of their flight over water.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The Authority will require Air Operator's Certificate (Balloon) (AOC(B)) holders to amend their Operations Manuals to include a requirement that lifejackets be provided for all persons on board a balloon:

(a) when flying over water; or

(b) when take-off or landing at a site where the take-off or approach path is so disposed over water that in the event of a mishap there would be a likelihood of ditching; or

(c) when the wind is less than 5 kts onshore at take-off from a site located with 1 nm of water measured at the ordinary high water mark.

AOC(B) holders will be notified by means of a Notice to AOC(B) Holders by the end of May 1998. The applicability date for the requirement will be 1 January 1999.

CAA Action

Balloon AOC Operations Manuals have been amended to prescribe the carriage of lifejackets for the occupants of balloons when operating close to the coast or over substantial stretches of water. The conditions are listed in full in Balloon Notice 3/98, dated March 1999.

RECOMMENDATION 98–22

It is recommended that the CAA require UK balloon manufacturers to review the integrity of their balloons so that separation of the basket from the envelope does not result in uncontrolled release of gaseous or liquid propane.

Status – Partially Accepted – Open

CAA Response

The Authority partially accepts this Recommendation.

This Recommendation assumes that, irrespective of the design of the balloon, separation of the basket will occur. This is not necessarily the case. Manufacturers may choose to demonstrate that for a particular design of balloon, separation of the basket will be improbable, i.e. avoidable throughout the life of the balloon. In these cases, it would not be necessary to provide additional integrity for the fuel system.

However, BCAR 31, 'Manned Free Balloons', will be amended to address the issue of additional fuel system integrity for balloon designs in which basket separation has not been shown to be improbable. It is intended to incorporate this amendment into BCAR 31 by 31 December 1998. Retrospective application of these new requirements will be considered taking account of the likely additional safety benefits and the regulatory burden imposed on manufacturers and operators.

CAA Action

A Statement of Intent to amend BCAR 31 to address this issue has now been raised. It is intended to complete the amendment to BCAR Section 31 by 31 December 1999.

Cessna 150M	**Nr Cumbernauld Aerodrome**	**6May97**	**Accident**

References: Bulletin 1/98 dated 12 Jan 98
FACTOR F6/98 dated 9 Feb 98

RECOMMENDATION 97–52

It is recommended that the Medical Department of the CAA Safety Regulation Group should obtain advice from an appropriate source as to the measures they should employ to detect toxic heart or other organ damage when examining candidates for medical certificates who have been treated for cancer.

Status – Partially Accepted – Closed

CAA Response

The Authority partially accepts this Recommendation.

The Authority considers that sufficient evidence exists to classify cancer treatments into two categories, those that may give rise to potentially incapacitating toxic heart or other organ damage and those that are considered most unlikely so to do.

With regard to cancer treatments that may give rise to potentially incapacitating heart or other organ damage, expert opinion is being sought to determine appropriate investigations for the detection of such damage in those applicants who have been so treated.

The Authority does not consider it appropriate to utilise resources to determine the toxic effects of cancer treatments which are considered to be most unlikely to cause an increased risk of incapacitation.

It is anticipated that conclusions will be reached by June 1998. If appropriate, these will be brought to the attention of the JAR–FCL Medical Sub-Committee for consideration of amendment of JAR–FCL Part 3 (Medical).

CAA Action

Expert opinion has been sought to determine appropriate investigations for the detection of toxic heart or other organ damage in those applicants who have been treated with particular forms of chemotherapy. It does not consider it appropriate to utilise resources to determine the toxic effects of other cancer treatments which are considered to be most unlikely to cause an increased risk of incapacitation.

A protocol has been developed for the assessment of such cases and all such cases holding UK licences have been identified and submitted to investigation along these lines. New applicants with such histories will also be examined according to this protocol. There is international activity on this front as the longterm side effects of such chemotherapy are becoming apparent and this continues to be monitored such that the protocol will be adjusted according to best practice.

Sky 220-24 Balloon	**Nr Addingham, N.Yorkshire**	**31Mar97**	**Accident**

References: Bulletin 4/98 dated 16 Apr 98
FACTOR F16/98 dated 1 Jun 98

RECOMMENDATION 98–24

The CAA should consider mandating the wearing of suitable head protection for the use of all balloon occupants.

Status – Not Accepted – Closed

CAA Response

The Authority does not accept this Recommendation.

The Authority already requires the provision of head protection for all balloon occupants on flights where it is likely that 'other than normal conditions could be encountered during the course of a flight, for example a landing on steep or rocky terrain or at high speed' (Operations Manual page 22 para 30.1). However, the provision of properly fitted head protection for all occupants on all flights would be very difficult. Indeed, incorrectly fitted head protection may be of greater danger than flying without protection.

The Authority will revise and reissue the Aeronautical Information Circular (AIC) 'Head Protection During Certain Aviation Operations in Light Aircraft and Balloons'. The revised AIC includes information on ballooning and will be issued by end May 1998.

CAA Action

The Authority has revised and reissued the Aeronautical Information Circular (AIC) 'Head Protection During Certain Aviation Operations in Light Aircraft and Balloons'. AIC 101/1998 (Pink 175) 'strongly recommends the wearing of protective helmets by the occupants of open cockpit aircraft, or of any aircraft, including balloons, engaged in activities where there is an increased risk of collision with the surface or obstacles'.

RECOMMENDATION 98–25

The CAA should ensure that balloon manufacturers design and supply control lines that are adequately routed and of a suitable length so as to reduce the possibility of inadvertent entanglement with personnel or equipment during all phases of flight.

Status – Partially Accepted – Closed

CAA Response

The Authority partially accepts this Recommendation.

BCAR 31, Manned Free Balloons, paragraph 31.49 already requires each control system and operating device to be designed and installed in a manner that will prevent jamming, chafing or interference from passengers, cargo, or loose objects. Therefore, the Authority does not consider that any new requirements are needed to ensure that control lines are adequately routed and of a suitable length adequate to reduce the possibility of inadvertent entanglement with personnel or equipment during all phases of flight.

However, the Authority will publish, by 31 July 1998, a Notice to Air Operators Certificate (Balloons) Holders reminding operators of their obligations to minimise the possibility of injury to passengers caused by entanglement in control lines.

CAA Action

The Authority has published Balloon Notice 1/99 (for Balloon Air Operators Certificate Holders) which reminds operators of their obligations to minimise the possibility of injury to passengers caused by entanglement in control lines.

RECOMMENDATION 98–26

The CAA should encourage operators holding a commercial balloon AOC to include, in their company operating manuals, an initial restriction on the windspeed limits applicable to pilots upgrading from their current type to significantly larger balloons.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

AOC – Balloons (AOC(B)) Operations Manuals already contain windspeed limitations. The Authority will require these to be expanded to include an initial windspeed restriction applicable to pilots upgrading to larger balloons. A Balloon Notice (for Balloon AOC Holders) will be issued by the end of June 1998.

CAA Action

AOC (Balloons) (AOC(B)) Operations Manuals already contain windspeed limitations. The Authority now requires these to be expanded to include an initial windspeed restriction applicable to pilots upgrading to balloons more than 50% larger than types flown previously. Balloon Notice 2/99 for AOC(B) Holders, dated March 1999, contains the relevant information.

RECOMMENDATION 98–27

The CAA consider whether commerical balloon operators should incorporate into their operations manual, or other standing instruction, a written disaster management plan and provide adequate training, in first-aid at an appropriate level, for their ground crew personnel accordingly.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

AOC – Balloons (AOC(B)) Operations Manuals already contain Accident Procedures which are in essence a simple disaster plan. The Authority will require these to be expanded to cover all scenarios and detail pilot, retrieve crew and company actions in the event of an accident. A Balloon Notice (for Balloon AOC Holders) will be issued by the end of August 1998 advising AOC(B) holders of the need to incorporate a disaster plan in their Operations Manuals by 1 March 1999.

CAA Action

AOC (Balloons) Operations Manuals already contain Accident Procedures. The Authority now requires these to be expanded to cover all scenarios and to detail pilot, retrieve crew and company actions in the event of an accident. Balloon Notice 3/99, dated March 1999, contains the relevant information.

First-aid and fire training is strongly recommended for at least one member of each retrieve crew. Balloon Notice 4/99, dated March 1999, refers.

Piper PA34 Seneca	**Nr Southend Airport**	**6Mar97**	**Accident**

References: Bulletin 12/97 dated 9 Dec 97
FACTOR F5/98 dated 9 Feb 98

RECOMMENDATION 97–56

It is recommended that the CAA, irrespective of any delays in the adoption of other elements of JAR–OPS, adopt the changes to the Instrument Rating test in line with the proposed JAR FCL with effect from 1 January 1998.

Status – Fully Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

As part of the JAR–FCL implementation process, the JAR–FCL instrument rating skill test for aeroplanes has been introduced from 1 January 1998 for initial tests and is planned to be extended to renewal flight tests by December 1998 in conjunction with the introduction of JAR–FCL aircraft class and type rating renewal arrangements.

CAA Action

Introduction of the JAR–FCL instrument rating renewal flight test has been delayed to 1 Jan 2000 to integrate the necessary changes with other aspects of JAR–FCL introduction.

Piper PA28R-200 Cherokee-Arrow II	**Skiddaw**	**13Feb92**	**Accident**

References:

RECOMMENDATION 92–32

The CAA consider ways of enhancing the training content of the IMC Rating, to bring it closer to the ICAO minimum standard for IFR operations. This should include the incorporation of a full navigation flight test, with increased emphasis on the use of radio aids for en route navigation, and including a descent to minimum safe altitude and diversion due to (simulated) adverse weather conditions.

Status – Fully Accepted – Open

CAA Response

The Authority accepts this Recommendation which will be covered in a review of the future of the IMC Rating conducted in the context of the introduction from 1993 of European harmonised flight crew licensing requirements.

CAA Action

External consultation did not generate support for the CAA's proposals for the introduction of an Instrument Weather Rating to replace the present IMC rating. CAA has withdrawn them to consider alternative proposals.

Jaguar; Cessna 152	**Carno**	**29Aug91**	**Accident**

References: AAR 2/92 dated 29 Apr 92
FACTOR F2/92 dated 16 Jun 92

RECOMMENDATION 92–07

Together with the Ministry of Defence, NATS should examine methods of making available, on a daily basis, information concerning areas where high intensity military low flying will take place, so that civil operators may plan to avoid or overfly these areas.

Status – Fully Accepted – Open

CAA Response

The Authority and the Ministry of Defence accept this Recommendation. An Aeronautical Information Circular on the subject of Military low flying is being prepared.

CAA Action

The entry into service of ALFENS (Automated Low Flying Flight Planning Enquiry Notification System) has been further delayed and is now under review; the feasibility of creating an 'advice desk' will be considered once the outcome of the review is known.

Piper PA28-181	**Stanmore**	**18Apr91**	**Accident**

References:

RECOMMENDATION 01

The CAA initiate action to amend the Air Navigation Order Article 52, such that when a person is involved in an accident or incident or is suspected of an offence under the Article, the person may be required to submit to appropriate tests and provide samples.

Status – Fully Accepted – Open

CAA Response

The CAA accepts this Recommendation and action is in hand to amend the ANO. However the Civil Aviation Act has to be amended before the ANO. This may take some time and is a matter for the DTp.

CAA Action

The amendment to the Air Navigation Order will not be possible until the Civil Aviation Act has been suitably amended to give the primary legislation power for the Authority to amend the Order. The Department of the Environment, Transport and the Regions has consulted widely regarding the content of the proposed amendment and is currently considering what action take. The response to the consultation to the Air Navigation Order will depend on their conclusions.

The 20mgs per 100ml of blood alcohol limit when on duty is included in JAR–OPS 1. The implementation of JAR–OPS 1 is awaiting EC Regulation action, the date of which is yet to be specified.

Part 4 – AAIB Recommendations Involving the Department of the Environment, Transport and the Regions

Sikorsky S61	**Bressay, Shetland Islands**	**19Nov97**	**Accident**

References: Bulletin 4/98 dated 16 Apr 98
FACTOR F15/98 dated 1 Jun 98

RECOMMENDATION 98–28

It is recommended that the manufacturer of the winch reviews the design and/or assembly, including the use of tooling, of the mechanism to ensure that it is physically not possible to assemble the guillotine incorrectly and, in the interim, issues more comprehensive guidance in the form of a procedure which may alleviate the problem.

Status – Fully Accepted – Closed

DETR Action

The manufacturer of the winch has taken action to avoid incorrect fitting of the guillotine, including a change to the manufacturing process. The Maritime and Coastguard Agency has undertaken research into the fitting of a second hoist. The outcome is that a permanently fitted hoist is being fitted in addition to the present one. Both hoists are being fitted in parallel.

RECOMMENDATION 98–30

It is recommended that the operator, in conjunction with HM Coastguard and the CAA, urgently address the feasibility of radio communication between the winchman and the helicopter, and that the CAA should require the operator to address the communication between the winchman and the operator within the Operations Manual.

Status – Fully Accepted – Open

DETR Action

Research is ongoing into finding a solution to the problems concerning communications between the winchman and the crew once he has departed the cabin. As an interim measure a number of modifications have been made to the present Alpha helmet, and a ruggedised connector and electronic interface have been fitted to connect to the waterproof NAVICO hand-held radio. It is expected that the research will take some time to come to fruition.

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