Safety Regulation Group

Civil Aviation Authority

CAP 652

Progress Report 1995

CAA Responses to Air Accidents Investigation (AAIB) Safety Recommendations

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CAA Responses to AAIB Recommendations received up to 31 December 1994, presented to the Secretary of State for Transport July 1995

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 previsously 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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Enquiries regarding the content of this publication should be addressed to:
Safety Analysis Department, Safety Regulation Group, Civil Aviation Authority, Aviation House, Gatwick Airport South, West Sussex, RH6 0YR.

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Foreword

In the UK, the Civil Aviation Authority (CAA) is responsible for civil air safety, i.e. 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 Transport, 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, i.e. 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 – either by the Authority or others – is by means of Safety Recommendations.

Recommendations can be, and are, 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 Authority 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, e.g. the European Joint Aviation Authorities or the Authority responsible for the initial certification of the aircraft type. The Authority 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 Accident Investigation Report is published, all Recommendations made are listed in the final report. In such cases, the Authority publishes its Response to the Recommendations on the day the Report is published.

The CAA Responses to all Recommendations addressed to the Authority are published, initially, by means of a FACTOR (Follow-up Action on Occurrence Report) but will subsequently appear in Part 2 of this Annual Report.

Some Recommendations involve long term investigation or research. In order to determine appropriate action when this is so, the Authority's response will indicate that the status of the Recommendation is 'Open' until all action by the CAA has been completed.

Some of the Recommendations made by the AAIB are addressed to organisations other than the CAA: such Recommendations are not included in this Annual Report. It should however be noted that the Department of Transport has indicated a wish to publish herein its Responses to Recommendations addressed to the Department. The Authority supports this broadening of the coverage of the Annual Report: the new section for the Department of Transport will be introduced next year.

This is the sixth Annual Progress Report submitted to the Secretary of State for Transport. It contains all Recommendations addressed to the Authority and received during 1994 together with the Authority's responses. This Report also contains the current status of earlier Recommendations which were listed as 'Open' in the previous Progress Report. Part 1 of this report is a statement of their position as at 31 May 1995.

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CAA Responses to AAIB Recommendations 6th Report

1 Introduction

This Report is in response to the Secretary of State for Transport's request to the Authority for Annual Reports on the status and progress of its responses to the Recommendations made to the Authority from the Air Accidents Investigation Branch. This Report covers all of those Recommendations which remained open from the previous Report and these are dealt with in Part 1. All Recommendations received during 1994 are dealt with in Part 2.

2 Recommendations – Status Summary

2.1 *Recommendations Outstanding from Previous Report*

51 Recommendations remained open from the previous Report, of which 23 have now been closed and 28 remain open requiring further Authority action.

2.2 *New Recommendations Received*

During 1994, a total of 41 Recommendations addressed to the Authority were received compared with 48 for 1993. A Summary of the Acceptance and Current Closure Status of these is as follows:

Year	*Acceptance*		*Not Accepted*	*Current Status*	
	Full	*Partial*		*Open*	*Closed*
1993	38	6	4	10	38
1994	30	3	8	13	28

NB: Recommendations not addressed to the Authority are not included in the text of this report and are excluded from the above statistics.

3 Overall Summary of Recommendations Addressed to the Authority

	Total	*Accepted*	*Partially or Not Accepted*	*Current Status*	
				Open	*Closed*
PRE 1993	624	466 (75%)	158	18	606
1993	48	38 (79%)	10	10	38
1994	41	30 (73%)	11	13	28
TOTAL	713	534 (75%)	179	41	672

Part 1 – AAIB Recommendations Remaining Open from the 1994 Progress Report

AS355 TWIN SQUIRREL	**SWALCLIFFE**	**08Apr86**	**ACCIDENT**	**8600990**	**89/03**

References: AAR 7/87 dated 16Dec87
FACTAR F7/88 dated 29Feb88

RECOMMENDATION 4.07

A review of current CAA and FAA proposals relating to the criteria for likely icing conditions at low altitude be conducted.

Status – Accepted – Closed

CAA Action

The FAA have completed their work in collecting and collating icing atmosphere data. It is understood that an FAA policy decision has been taken not to amend the existing requirements, i.e. Appendix C of FAR Part 25, 29 etc.

In common with the FAA, the CAA has completed its initial review but will continue its research in co-operation with the UK Met. Office to investigate the icing atmosphere, particularly with respect to freezing rain and drizzle, i.e. conditions outside the JAR/FAR 25 Appendix C envelope, on a longer term basis. Efforts are being made to involve other European research organisations in this work with the aim that, as proposals for revised airworthiness requirements develop in the future, recognition of this work by Aviation Authorities, internationally, will permit the development of commonly acceptable standards.

BELL 222	**LIPPITTS HILL ESSEX**	**06May87**	**ACCIDENT**	**8700930**	**89/05**

References: AAR 3/88 dated 08Jul88
FACTAR F11/88 dated 18Aug88

RECOMMENDATION 4.13

The CAA require, for all aircraft types, the early provision of a facility continuously to monitor the vibration of all high speed rotating equipment whose integrity is critical to flight safety.

Status – Accepted – Closed

CAA Action

The CAA agrees that vibration monitoring equipment should be required on all turbine engines and is pursuing that objective through the appropriate JAA rule making procedures.

SIKORSKY S76A	**NORTH SEA**	**09Dec87**	**INCIDENT**	**8703362**	**89/07**

References: AAR 5/88 dated 14Sep88
FACTAR F14/88 dated 06Dec88

RECOMMENDATION 4.04

The CAA, in conjunction with helicopter operating companies, should consider the production and provision of a visual approach aid for use on platform and rig helidecks.

Status – Accepted – Open

CAA Action

As noted in the previous report no further work is currently being undertaken on the Omni-Directional Approach Path Indicator (ODAPI) device. The CAA paper reporting on the completed ODAPI trials has been delayed but will be published later this year. As reported previously, research continues with a programme of work to evaluate instrument-based approach aids.

Offshore flight trials are planned for 1995 with the objective of generating airworthiness and operational requirements for instrument based offshore approaches. In addition, a programme of work investigating helideck marking, lighting and visual cues for pilots has been started. It is hoped that this research will provide systems of marking and lighting adequate for use in the final visual phase of an instrument approach.

BOEING 737–236	**MANCHESTER AIRPORT**	**22Aug85**	**ACCIDENT**	**8502815**	**89/11**

References: AAR 8/88 dated 15Dec88
FACTAR F5/89 dated 13Mar89

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 – Accepted – Open

CAA Action

The FAA have reported their initial findings of full scale fire hardness tests of existing aircraft. The results of complementary tests by Darchem Co on representative components were published in CAA Paper 94002.

Further work has now been undertaken and a number of new materials tested. Results will be published in CAA Paper 95003. Further full-scale tests are planned by the FAA. Industry involvement in this work is being encouraged and a number of organisations are involved.

These research programmes are continuing and in due course the Authority will, in co-operation with JAA and FAA, determine what, if any, new requirements are necessary. To aid this process it is planned to present results and seek the views of the Industry at an International Cabin Safety Research Conference to be held at Atlantic City, USA, in November 1995.

SIKORSKY S61N	**NR SUMBURGH**	**13Jul88**	**ACCIDENT**	**8802141**	**90/03**

References: AAR 3/90 dated 06Sep90
FACTAR F3/90 dated 06Sep90

RECOMMENDATION 4.14

The CAA require, for all UK public transport helicopters, the early provision of a facility to continuously monitor the vibration of all high-speed rotating equipment whose integrity is critical to flight safety. (Made 21 November 1989).

Status – Accepted – Closed

CAA Action

The CAA agrees that vibration monitoring equipment should be required on all turbine engines and is pursuing that objective through the appropriate JAA rule making procedures.

BOEING 737-400	NR KEGWORTH	08Jan89	ACCIDENT	8900005	90/04

References: AAR 4/90 dated 18Oct90
FACTAR F4/90 dated 23Oct90

RECOMMENDATION 4.23

The CAA should require that, for aircraft passenger seats, the current loading and dynamic testing requirements of JAR 25.561 and .562 be applied to newly manufactured aircraft coming onto the UK register and, with the minimum of delay, to aircraft already on the UK register. (Made 30 March 1990).

Status – Accepted – Open

CAA Action

The CAA has been awaiting the outcome of the FAA Notice of Proposed Rulemaking NPRM 88-8 (Issued May 1988).

The CAA does not intend to take unilateral action. In the absence to date of a published FAA Final Rule, CAA will propose that JAA consider policy changes which address the fundamental points of JAR 25.561 and 562.

RECOMMENDATION 4.31

The CAA consider improving the airworthiness requirements for transport aircraft to require some form of improved latching to be fitted to overhead stowage bins and this should also apply to new stowage bins fitted to existing aircraft. (Made 30 March 1990).

Status – Accepted – Open

CAA Action

Further review of this recommendation and its implications has highlighted the desirability of wider consideration being given to the need for a re-assessment of the requirements and their application before work on drafting proposals for interpretative material for inclusion in JAR25 is undertaken. It has therefore been referred to the International Cabin Safety Team (ICST) (FAA/Transport Canada/CAA) for discussion and resolution on an internationally accepted basis. In support of the ICST review, the CAA will be preparing a proposed course of action and agreed recommendations are expected by the end of 1995. Consideration will also be given to the introduction of retroactive requirements in this respect.

SIKORSKY S61N	BRENT SPAR	25Jul90	ACCIDENT	9003279	90/12

References: AAR 2/91 dated 10Oct91
FACTAR F2/91 dated 10Oct91

RECOMMENDATION 4.02

The CAA considers with HSE the best arrangements for inspection of at least all restricted helidecks, and ideally all helidecks, which are regularly used by UK registered helicopters.

Status – Accepted – Closed

CAA Action

The Authority has completed the inspections of offshore installation helidecks, subject to the Minerals Workings (Offshore Installations) Act (1971), under contract to HSE, with a total of 253 inspections plus 11 re-inspections conducted. In addition, helidecks not covered by the Act (i.e. on vessels) have been inspected on an opportunity basis.

PIPER PA28-181	STANMORE	18Apr91	ACCIDENT	9101093	91/14

References: AAIB Letter dated 23Aug91
CAA Letter dated 01Nov91

RECOMMENDATION 4.01

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 – Accepted – Open

CAA Action

The Civil Aviation Bill, due to be introduced in 1994, still awaits Parliamentary time. This will not be available in the foreseeable future.

PIPER PA34	BOURNEMOUTH	25Aug91	ACCIDENT	9103040	91/21

References: AAIB Letter dated 29Oct91
CAA Letter dated 01May92

RECOMMENDATION 4.01

The CAA should review the requirement of AD 002-01-88, with particular reference to the quality of the required inspection, its periodicity and re-protection of the affected areas after each inspection.

Status – Accepted – Closed

CAA Action

CAA Additional Airworthiness Directive AD 002-01-88 has now been superseded by FAA AD 94-13-11. Whilst the replacement directive does not amend the method of crack detection, the FAA's logic that the existing method has proved adequate in America, has been accepted by CAA. On this basis, no additional action is planned.

CESSNA 172	SOUTHPORT	21Mar91	ACCIDENT	9100793	91/22

References: AAIB Letter dated 05Nov91
CAA Letter dated 14May92

RECOMMENDATION 4.03

It is recommended that the CAA consider requiring inclusion of relative humidity or dew point in aviation forecasts and weather reports.

Status – Accepted – Closed

CAA Action

As reported previously, the feasibility study conducted in response to the recommendation revealed that inclusion of relative humidity data into aviation forecasts is not practicable and will therefore not be pursued. It has also been concluded that, while it had initially seemed beneficial to provide objective numerical forecasts of atmospheric water distribution e.g. Liquid Water Content, further research has indicated that, although such forecasts could be provided, they would not provide the majority of General Aviation pilots with sufficiently usable data and in some cases could be dangerously misinterpreted. Thus such an approach has been discontinued as both impracticable, in terms of cost effective presentation, and undesirable, due to possible misinterpretation.

RECOMMENDATION 4.04

It is recommended that the CAA require the fitment of a warning system to alert pilots of induction system icing on future types of aircraft certificated in the UK, and consider a similar requirement for types currently certificated.

Status – Accepted – Open

CAA Action

The Authority has instigated a research programme to examine means by which induction system icing can be prevented.

The first stage of the research, a literature search, indicated that the most promising course of action would be to promote the development of a simple device for warning the pilot that he may be in icing conditions. Consideration is now being given to a research project aimed at producing a prototype for field trials. The results of the programme will be discussed with JAA members in order to establish a common certification requirement.

AS355-F2 TWIN SQUIRREL	**NR BIRMINGHAM**	**30Dec90**	**ACCIDENT**	**9005638**	**91/23**

References: AAIB Letter dated 05Nov91

RECOMMENDATION 4.01

It is recommended that the CAA conduct a review of the design and failure history of the engine-main gearbox drive train on Aerospatiale AS355 Twin Squirrel helicopters and give particular consideration to the following:

(i) More frequent inspection of the engine-main gearbox (MGB) Thomas couplings.

(ii) Re-torquing of Thomas coupling bolt retaining nuts after a short bedding-in period of operation, and consider the need for such a procedure on other aircraft with similar types of coupling.

(iii) Checks aimed at ensuring that engine-MGB alignment and drive train vibration levels are acceptable following replacement of an engine-MGB Thomas coupling that has suffered damage for which there is no clear explanation.

Status – Accepted – Closed

CAA Action

Addressing the Recommendation sub-parts in turn:

(i) CAA Letters to Operators (LTOs) 1191 and 1274 were issued advising more frequent in-situ inspection of couplings and mounting laminates. Subsequent investigations by the constructor has indicated that coupling deterioration is caused by degradation of

gearbox mountings. The aircraft Maintenance Manual has been revised to include appropriate maintenance inspections, and the CAA LTOs have been cancelled.

(ii) The constructor has completed an in-service trial of repeat torque tightening after a short bedding-in period. The trial demonstrated that such a procedure is unnecessary for AS355 series helicopters.

Certificating Authorities have confirmed that current procedures are adequate for other helicopter types with similar couplings validated by the CAA. The CAA has also reviewed the appropriate maintenance instuctions, with satisfactory results.

(iii) Test evidence leads the constructor and DGAC France to believe that vibration checks of the flexible couplings will not help to detect installational errors or coupling degradation at an early stage. The design is such that misalignment checks are not required if the engine and coupling are installed in accordance with the manufacturers instructions. The CAA agrees with this conclusion.

RECOMMENDATION 4.02

It is recommended that the CAA consider requiring, for UK registered public transport and police helicopters:

(i) Checks aimed at ensuring that engine-MGB alignment and drive train vibration levels are acceptable following disturbance of engine or MGB mountings or drive train components.

(ii) The early provision of a facility to monitor continuously the vibration of high-speed rotating equipment whose integrity is, or may foreseeably be, critical to flight safety.

Status – Accepted – Closed

CAA Action

The CAA Action statement in the 1994 Progress Report was sufficient to close this recommendation at that time; as it did for Report Number 90/19, Recommendation 4.08. The Status is therefore amended to 'Closed' but for clarity last years 'CAA Action' is reproduced here.

(i) Experience subsequent to this accident indicates that initial engine/gearbox misalignment was not the cause of Thomas coupling break-up. DGAC and Eurocopter state that misalignment checks are not required if the engine and coupling are installed in accordance with the manufacturer's instructions. Production tolerances are small and therefore alignment is not considered to be significantly influenced by build up of tolerances.

FAA and DGAC confirm that installation checks on other aircraft types are adequate and that no further action is required.

(ii) The current UK Certification standard for new large helicopter types is JAR 29 which defines the safety objectives. A safety assessment is required to confirm that they will be met. The Authority is satisfied that the objectives will not be met with current transmission technology without vibration health monitoring.

JAR 27 for small helicopters, agreed by the JAA Helicopter Airworthiness Steering Group and published in September 1993, requires a design assessment for Category A rotorcraft but not Category B. The Authority accepts this position.

The CAA Discussion Paper 'The Airworthiness of Group A Helicopters' has led to proposals for retrospective application of the JAR 29 design assessment requirements, targeting those helicopters operating over hostile terrain and city centres. The proposals will be submitted for JAA consideration with a view to joint implementation. UK North Sea operators have each established a programme to embody Health and Usage Monitoring Systems (HUMS), incorporating vibration monitoring, into their existing fleets.

RECOMMENDATION 4.03

It is recommended that the CAA consider extension of the Mandatory Occurrence Reporting system to include aircraft under 2730 kg maximum gross weight in the Public Transport and Aerial Work categories, and take measures aimed at ensuring that the service experience of operators and maintainers is fed back to the manufacturer and expeditiously shared with other relevant UK operators and maintainers.

Status – Accepted – Open

CAA Action

The Authority accepted the recommendations of the Specialist Study Group which were, in essence, to amend Article 106 of the ANO to require reporting in respect of all public transport aircraft, and all turbine powered aircraft irrespective of certification category. In September 1994, the Authority sent a Letter of Consultation to relevant persons and organisations in the industry. Responses were required by 9 December 1994 : there were six. From a review of these, it would seem that there is no fundamental objection to the proposed amendment to the ANO and the Authority is now proceeding with the change, with the intention that it will be included in the next amendment to the ANO.

BAC 111	**NR DIDCOT**	**10Jun90**	**ACCIDENT**	**9002400**	**91/27**

References: AAR 1/92 dated 14Apr92
FACTAR F1/92 dated 14Apr92

RECOMMENDATION 4.07

The CAA should recognise the need for the use of corrective glasses, if prescribed, in association with the undertaking of aircraft engineering tasks.

Status – Accepted – Closed

CAA Action

The amendment to Article 13 of the Air Navigation Order came into force in May 1995. An Airworthiness Notice no. 47, which will include amplifying details on the subject for

maintenance engineering licence holders and their employers, is to be published shortly as a result of this amendment.

RECOMMENDATION 4.08

The CAA should ensure that, prior to the issue of an ATC rating, a candidate shall undergo an approved course which includes training in both the theoretical and practical handling of emergency situations. This training should then be enhanced at the validation stage and later by regular continuation and refresher exercises.

Status – Accepted – Open

CAA Action

(i) From 31 July 1994, mandatory attendance at an approved course of training became one of the qualifications for the grant of an ATC licence. All approved ATC courses must now contain emergency training that is designed to meet standards and course objectives as required by the Authority. In addition, ATC colleges are required to consult with ATC units and aircraft operators appropriate to the rating course for which the emergency training is being developed.

(ii) The Authority's intention to require the implementation of emergency training plans at ATC units by January 1995 has been modified following representations, regarding the practicability of the proposed timescales, made by the Airport Operators Association during the consultation process. Units are now required to submit their proposed plans for the consideration of the appropriate Regional Inspector ATS by 1 September 1995 and to achieve implementation by 1 January 1996. From January 1995 all controllers are being assessed orally on their knowledge of emergency procedures, as part of their annual competency check.

PIPER PA34-200T SENECA II **COMPTON ABBAS** **17Sep91** **ACCIDENT** **9103409** **92/01**

References: Bulletin 3/92

RECOMMENDATION 92-13

The CAA consider extension of the Mandatory Occurrence Reporting system to include aircraft under 2,300 kg maximum gross weight in the Public Transport and Aerial Work categories, and take measures aimed at ensuring that the service experience of operators and maintainers is fed back to the manufacturer and expeditiously shared with other relevant UK operators and maintainers. (This Recommendation was also previously made following the investigation into Aerospatiale Twin Squirrel, G-WMPA on 30 December 1990, AAIB Bulletin 12/91).

Status – Accepted – Open

CAA Action

The Authority accepted the recommendations of the Specialist Study Group which were, in essence, to amend Article 106 of the ANO to require reporting in respect of all public transport aircraft, and all turbine powered aircraft irrespective of certification category. In September 1994, the Authority sent a Letter of Consultation to relevant persons and organisations in the industry. Responses were required by 9 December 1994 : there were six. From a review of these, it would seem that there is no fundamental objection to the proposed amendment to the ANO and the Authority is now proceeding with the change, with the intention that it will be included in the next amendment to the ANO.

AIRBUS A310; BAe JETSTREAM 31	**'BEREK'**	**14Jan92**	**ACCIDENT**	**9200085**	**92/03**

References: Bulletin 4/92
FACTOR F12/93 dated 04May93

RECOMMENDATION 92-15

It is recommended that the CAA define the requirements of an effective radar/RTF replay system for incident/accident investigation and implement them as soon as practicable.

Status – Accepted – Open

CAA Action

The formal consultation process regarding the proposed requirements for Radar Recording equipment is now complete. Requirements for such equipment are to be published in CAP 581 (Air Traffic Services Engineering Requirements) by August 1995 and will apply to new installations. The National Air Traffic Services intend to continue development of replay systems based upon the NODE(M) radar display system at the Manchester Area Control Centre and the NODE(L) system at London Area and Terminal Control Centre. During 1995/1996, synchronised RTF and radar replay facilities will be available at these units as it will be for the radar recording facilities to be installed at the Swanwick Area Control Centre and at the new Scottish Centre.

RECOMMENDATION 92-16

It is recommended that the CAA make provision for ATCOs to receive regular periodic training in the handling of abnormal/emergency situations and that it be a requirement for them to satisfactorily complete such training.

Status – Accepted – Open

CAA Action

The Authority's intention to require the implementation of emergency training plans at ATC units by January 1995 has been modified following representations regarding the

practicability of the proposed timescales made by the Airport Operators Association during the consultation process. Units are now required to submit their proposed plans for the consideration of the appropriate Regional Inspector ATS by 1 September 1995 and to achieve implementation by 1 January 1996. From January 1995 all controllers are being assessed orally on their knowledge of emergency procedures as part of their annual competency check.

JAGUAR; CESSNA 152	**CARNO**	**29Aug91**	**ACCIDENT**	**9103079**	**92/07**

References: AAR 2/92 dated 29Apr92
FACTAR F2/92 dated 16Jun92

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 – Accepted – Open

CAA Action

The National Air Traffic Services (NATS) continues to pursue this objective although it is not yet feasible for either the Aeronautical Information Service or the Ministry of Defence (MoD) to utilise the 'dial a fax' NOTAM Navigation Warning system for this purpose. The Automated Low Flying Entry and Planning Notification System (ALFENS) is to be introduced in July this year on a trial basis. Once this system is proved in operational use, NATS will investigate, in conjunction with MOD, the possibility of creating an 'advice desk' to provide the service called for by the Recommendation.

RECOMMENDATION 92-08

Military flow directional arrows should be published on civil aeronautical charts and that those RAF stations that operate fast jets should be 'highlighted'.

Status – Partially Accepted – Closed

CAA Action

UK AIP RAC 5-0-1.1 (Chart of UK Areas of Intense Aerial Activity (AIAA), Aerial Tactics Areas (ATA) and Military Low Flying System) was re-issued on 24 November 1994 and now shows Military Aerodrome Traffic Zones (MATZ) together with military low-flying system flow arrows. This now makes the depiction of the Low-flying 'choke points' more meaningful. However, it was considered that to highlight on civil aeronautical charts those RAF stations that operate fast jet traffic could be detrimental to safety by concentrating attention on those RAF stations rather than on the complex military low flying system.

RECOMMENDATION 92-09

The CAA should re-examine the UK definition of aerial work and ensure that the legislation allows that the activities of operators engaged in aerial photography flights of a commercial nature may be properly and safely regulated.

Status – Accepted – Open

CAA Action

Proposals to amend the UK definition of aerial work were circulated within the Authority. Subsequently, the JAA Operations Committee have formed a definitions working group which is also addressing the definition of aerial work. When implemented, the JAA definition will supersede that in UK legislation. The Authority has therefore decided not to amend the UK definition but will seek to ensure that the JAA definition of aerial work allows operators engaged in aerial photography flights of a commercial nature to be properly and safely regulated.

PIPER PA28R-200 CHEROKEE-ARROW II	**SKIDDAW**	**13Feb92**	**ACCIDENT**	**9200386**	**92/09**

References: AAIB Letter dated 08May92
CAA Letter dated 25Jun92

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 – Accepted – Open

CAA Action

The IMC working group presented its final proposals to the Standing Advisory Committee on Pilot Licensing (SACP) in October 1994. The committee fully supported the recommendations with regard to the replacement of the IMC rating with a new rating to be called the Instrument Weather Rating (IWR). Proposals for the replacement of the IMC rating are in the final stages of consideration by the CAA prior to the proposals going to industry for formal consultation.

ROBINSON R22 MARINER	OLDHAM	23Feb92	ACCIDENT	9200496	92/12

References: AAIB Letter dated 10Jun92
CAA Letter dated 22Oct92

RECOMMENDATION 92-26

Existing certification criteria in relation to pilot intervention times following loss of power should be re-appraised when formulating JAR 27. Revised requirements should be based upon the results of current research into pilot intervention times. The relevance of the guidance material contained in the existing Appendix to BCAR Section G2-8 should also be considered for inclusion in future requirements.

Status – Accepted – Open

CAA Action

Two items of research have been instigated in relation to this recommendation.

(a) Intervention Times. Research conducted by the DRA Centre for Human Sciences, investigating pilot intervention times following total loss of power by gathering simulator data using both military and civil crews, is now reaching completion. A report on the results of this work will be published this year.

b) Rotor RPM Loss and Warning. A paper detailing the research work undertaken by Westland Helicopters Limited, on behalf of the Authority, to investigate methods of reducing rotor rpm loss following engine failure was published and presented at the European Rotorcraft Forum in Amsterdam, in October 1994. The work included controlled piloted simulation trials to assess the relative merits of various additional warning and intervention strategies.

The results of this research together with consideration of existing requirements, are contributing to ongoing discussions with the JAA and FAA for proposed amendment to JAR 27/29. The final outcome of these discussions has yet to be determined.

RECOMMENDATION 92-27

Publicity material should be forwarded to all owners and operators of light helicopters emphasising the following safety points:-

(a) The crucial importance of fully lowering the collective pitch lever without delay as soon as power loss occurs.

(b) The need for continual practice of engine failure emergency procedures.

(c) A recommended 'recency' check by a qualified helicopter flying instructor for a pilot who has not flown a light helicopter within the previous 28 days.

Status – Accepted – Closed

CAA Action

The General Aviation Safety Sense Leaflet Number 17, titled Helicopter Airmanship, was published in February 1995. The leaflet provides guidance upon a wide range of safety related issues including all those raised by the Safety Recommendation and is provided free of charge to all registered owners of general aviation helicopters and gyroplanes.

PIPER PA34-200T SENECA II	**OXFORD**	**13May92**	**ACCIDENT**	**9201647 92/17**

References: Bulletin 7/92
FACTOR F21/93 dated 14Sep93

RECOMMENDATION 92-47

It has been recommended that the Civil Aviation Authority require a periodic check of the swivel pin and assess the need for mandatory replacement of the fitting type with one of more robust design.

Status – Accepted – Open

CAA Action

The FAA has issued an NPRM (Docket No. 93-CE-61-AD) concerning the initial part of this recommendation (i.e. the requirement for a periodic check of the swivel pin). Further CAA action will await the outcome of this FAA proposed rulemaking in the anticipation that such inspection will render replacement unnecessary.

PIPER PA28-161 WARRIOR	**OXFORD**	**12Jul92**	**ACCIDENT**	**9202724 92/21**

References: AAR 1/93 dated 10Mar93
FACTOR F7/93 dated 06Apr93

RECOMMENDATION 93-15

The CAA should require that for wake turbulence spacing purposes, all large helicopters that are not known to be on the ground, including those hovering, should be treated as in flight and within the 'flight path' as presently defined.

Status – Partially Accepted – Closed

CAA Action

Following the receipt of the Safety Recommendation, the National Air Traffic Services Chief Scientist Division commissioned research into the subject of helicopter wake turbulence. Although the subsequent reports did not recommend specific separation criteria for helicopters and fixed wing aircraft, the findings did reinforce existing knowledge of the wake vortex produced by helicopters. Existing separation minima are consistent with the views contained in the results of the research. However, the Manual of Air Traffic Services Part 1 now contains expanded guidance and instructions regarding the operation of helicopters in the vicinity of runways and requires vortex wake separation to be applied between helicopters air taxying across runways and other aircraft

BAe ATP	**SUMBURGH**	**23Dec91**	**ACCIDENT**	**9104733**	**92/33**

References: AAR 6/92 dated 30Dec92
FACTOR F6/92 dated 30Dec92

RECOMMENDATION 92-107

The CAA should, with the assistance of the Meteorological Office:-

(a) Sponsor practical trials to assess the combinations of strong wind, topography and convective instability which may combine to create a significant windshear hazard.

(b) Increase the number of airfields provided with a windshear alerting service to encompass those airfields most at risk to windshear.

(c) Review the list of airfields at Appendix B of CAP 573 with a view to including UK airports which support domestic scheduled air services and which are prone to hazardous wind conditions.

Status – Accepted – Open

CAA Action

(a) Following an internal review it was decided to take advice from a specialist in Windshear, who has been contracted to carry out a full survey and produce criteria which could be used to quantify the severity of the turbulence in terms of its effect on aircraft handling. A report is due to be produced in September 1995.

(b) Dependent on the outcome of work on item(a) above.

(c) Action on this section was completed as stated in last years report. No further action necessary. Closed.

BELL 206	WHITSTABLE	12Sep92	ACCIDENT	9203814	92/35

References: Bulletin 12/92
FACTOR F24/93 dated 14Sep93

RECOMMENDATION 92-85

The CAA, in conjunction with the FAA, take action with the engine manufacturer to introduce some form of positive locking of the B nuts on the compressor delivery pressure (Pc) sensing line on all Allison 250 Series engines, to prevent the loosening of such nuts and consequent sudden loss of engine power.

Status – Rejected – Closed

CAA Action

The CAA has collaborated with the FAA and Allison in investigating the 'B' nut difficulties on Allison 250 engines. The investigation concluded that a 'B' nut assembly which passes the inspection criteria identified in the maintenance manual and which is properly torqued to the established value will not become loose in service.

A total of nine occurrences have been reported to the Authority where 'B' nuts were found loosened; five of these occurrences were investigated by the AAIB. All but two of the nine occurrences were related to 'B' nuts located on the fuel control unit or power turbine governor where access is difficult. This tends to support the view that 'B' nut loosening is more likely to be the result of maintenance practices than faulty design.

The CAA therefore issued an Airworthiness Directive requiring torque checking of all 'B' nuts on the Allison 250 within 50 hours of receipt of the Airworthiness Directive and thereafter whenever the nuts are disturbed. The directive emphasises the importance of strict adherence to the procedures listed in the Allison manuals, and has recently been strengthened by reminding maintenance personnel of the leak check procedures, and requiring that 'B' nut torque values are recorded in the engine log book.

BAe ATP	LIVERPOOL	19Apr92	ACCIDENT	9201226	92/39

References: Bulletin 2/93
FACTOR F3/93 dated 02Mar93

RECOMMENDATION 92-90

The CAA, in consultation with the JAA and FAA, should review the advice available to manufacturers on evacuation slide certification with a view towards issuing revised material, additional to current industry practice, for the high sill height cases. This new material should take account of likely combinations of structural damage and oleo extension after the collapse of one or more legs of the landing gear to ensure that such slides provide a safe means of evacuation, with acceptable maximum slide angles.

Status – Accepted – Open

CAA Action

The issues arising from this Recommendation have been considered by the International Cabin Safety Team. Thus far, only one other similar incident has been identified. Work is continuing within the forum of the International Cabin Safety Team on studying the available evidence and the possible drafting of proposals. Conclusions are expected by the end of 1995.

RECOMMENDATION 92-91

The CAA, in consultation with the JAA and FAA, should re-examine existing aircraft/slide configurations to determine whether, in the event of the likely conditions arising from the collapse of one or more legs of the landing gear, the safe evacuation requirements of JAR/FAR 25.809 can be met.

Status – Accepted – Closed

CAA Action

An investigation has been conducted into the ATP slide certification using the current interpretation (i.e. does not include fuselage deformation or oleo extension caused by aircraft deceleration) and the findings confirmed that the design fully meets JAR/FAR 25.809. There is no evidence to suggest that other aircraft do not comply with this requirement. However, depending upon the findings of the review being conducted under Recommendation 92-90, consideration may need to be given to current aircraft against any new or revised requirement/interpretation.

BOEING 747-200	**NEWARK NEW JERSEY USA**	**25Sep92**	**INCIDENT**	**9203990**	**93/02**

References: Bulletin 3/93
FACTOR F16/93 dated 20Jul93

RECOMMENDATION 93-01

The CAA, in consultation with the FAA and the aircraft manufacturer, should require the mandatory replacement of air duct clamps part number 7540602 with redesigned clamps to part number 7541751 on all Boeing 747 aircraft, in zones where fuel pipes are present, in order to reduce the incidence of clamp failure and possible critical secondary damage effects upon fuel, hydraulic and electrical systems.

Status – Accepted – Closed

CAA Action

FAA Airworthiness Directive 94-09-13, which became effective on 17 June 1994, requires air duct clamps in zones where fuel pipes are present to be replaced with clamps of the type identified in the AAIB Recommendation.

AS355 TWIN SQUIRREL	**LLANBEDR**	**08Dec92**	**ACCIDENT**	**9205078**	**93/06**

References: AAR 1/94 dated 18Jan94
FACTOR F1/94 dated 18Jan94

RECOMMENDATION 93-34

Require, for UK registered AS355 helicopters and other types with similar design features, more frequent inspection of the MGB bi-lateral suspension system laminated pads of a type that permits adequate assessment of their condition, and require recommended inspection intervals and procedures to be clearly specified.

Status – Partially Accepted – Closed

CAA Action

Following the action taken on the AS355, as stated in the 1994 Report, the CAA review of other helicopter types is now complete. No actions have been determined to be necessary, current maintenance procedures being considered adequate to ensure satisfactory gearbox mount condition.

RECOMMENDATION 93-35

Include considerations of the complexity of the aircraft and the type of operation in the criteria for:

(a) Approving use of the CAA Light Aircraft Maintenance Schedules (LAMS).

(b) Application of the CAA Mandatory Occurrence Reporting (MOR) system.

Status – Partially Accepted – Open

CAA Action

(a) The Authority, in consultation with the General Aviation Airworthiness Consultative Committee, has reviewed the philosophy of the Light Aircraft Maintenance Schedule and have agreed it to be an acceptable means of compliance with maintenance requirements.

(b) The Authority accepted the recommendations of the Specialist Study Group which were, in essence, to amend Article 106 of the ANO to require reporting in respect of all public transport aircraft, and all turbine powered aircraft irrespective of certification category. In September 1994, the Authority sent a Letter of Consultation to relevant persons and organisations in the industry. Responses were required by 9 December 1994: there were six. From a review of these, it would seem that there is no fundamental objection to the proposed amendment to the ANO and the Authority is now proceeding with the change, with the intention that it will be included in the next amendment to the ANO.

AS355 TWIN SQUIRREL	**NR LIVERPOOL**	**06Jan93**	**ACCIDENT**	**9300022 93/08**

References: Bulletin 5/93
FACTOR F26/93 dated 03Dec93

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 Action

The manufacturer, Eurocopter France (ECF), has developed a modification for an improved engine and main gearbox bay door locking and indicating mechanism.

DGAC France have approved the modification and ECF are in the process of producing a Service Bulletin. When published and once the DGAC position regarding mandatory compliance has been established, the need for further CAA action will be considered.

RECOMMENDATION 93-38

Consider requiring, for other UK registered helicopters, the fitment of such a system on doors that could constitute a flight safety hazard if not correctly latched.

Status – Accepted – Open

CAA Action

The Authority continues to carry out a review of service experience of the security of doors and hatches on UK registered in-service helicopters, the results of which will be known by the end of 1995. When the review has been completed, the need for further CAA action will be considered.

AS332L SUPER PUMA	**CORMORANT ALPHA N.SEA**	**14Mar92**	**ACCIDENT**	**9200749 93/09**

References: AAR 2/93 dated 27May93
FACTOR F14/93 dated 27May93

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 – Accepted – Open

CAA Action

Research into cockpit workload is ongoing. A project to compile, distribute and analyse a questionnaire to helicopter pilots should be completed by 30 June 1995. The questionnaire aims to identify which, if any, aspects of cockpit workload are considered unacceptable.

RECOMMENDATION 93-25

In further pursuance of the HARP Recommendation No 1, the CAA should commission a study into 'human error' helicopter accidents. The study should include recommendations for programmes of research and co-ordination of the industry's effort. The possibility of international collaboration should also be examined.

Status – Accepted – Open

CAA Action

In response to this recommendation the CAA set up a small internal working group to progress the matter. In parallel, discussions were being held to progress work in response to Recommendation 93-22, of the same report, which called for a high priority for the CAA study on cockpit workload, particularly paperwork. During these discussions it became evident that the results of that study would be relevant to any work in response to this recommendation. In addition Shell Aviation have funded a study into the potential benefits of technology on the incidence of Human Factors related accidents. The results of these two initiatives will provide information which will enable CAA to better define a work programme in relation to this Recommendation. The course of further action will therefore depend on these results.

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 – Accepted – Open

CAA Action

The subject was considered by the Review of Helicopter Offshore Safety and Survival (RHOSS) (see recommendation 93-30). In line with the observations and recommendations made by the RHOSS, CAA will be conducting a review of this issue.

RECOMMENDATION 93-30

The CAA, in consultation with the offshore oil industry and other appropriate bodies such as the HSE, should re-assess offshore helicopter passenger safety and survivability in normal operating conditions using the concept of an integrated escape and survival system in order

to promulgate such regulations as are necessary to achieve it; such an assessment should be made against both a controlled ditching and an uncontrolled crash into the sea where the helicopter inverts and sinks almost immediately.

Status – Accepted – Closed

CAA Action

The Review of Helicopter Offshore Safety and Survival (RHOSS) has been concluded and the report was published (CAP641) on the 1st March 1995. The review made 17 recommendations and for those aimed at the CAA, follow-up activity has been initiated.

BOEING B757-200	**NR LONDON HEATHROW**	**23Jan93**	**INCIDENT**	**9300187**	**93/11**

References: Bulletin 8/93
FACTOR F6/94 dated 27May94

RECOMMENDATION 93-41

The CAA in conjunction with the FAA and associated manufacturers, should review the need to display an EICAS REV amber message to the crew of Boeing 757 aircraft, in flight, when this is activated by only one of the two lock actuator sensors fitted to each engine, and actively consider upgrading the status of the message to a CAUTION, or WARNING, should two sensors on any one engine indicate both lock actuators unlocked in flight.

Status – Accepted – Open

CAA Action

Boeing have proposed a modification that will require a signal from two position sensors, one on a lock actuator and one on the thrust reverser sleeve, before the REV message is displayed in flight. CAA is awaiting the outcome of an FAA review of this proposal before considering further action.

RECOMMENDATION 93-42

The CAA should review, in conjunction with the FAA and associated manufacturers, the design of the lock/unlock indication system on Boeing 757 aircraft in relation to the present Maintenance Manual proximity sensor rigging instructions in view of their evident inability to prevent associated false warnings.

Status – Accepted – Open

CAA Action

Action on this Recommendation will be determined in the light of CAA response to Recommendation 93-41.

PIPER PA34	SHOREHAM	30Apr93	ACCIDENT	9301275	93/13

References: Bulletin 8/93 dated 04Aug93
FACTOR F11/94 dated 01Jun94

RECOMMENDATION 93-43

The CAA should expedite a review of the requirements of AD 002-01-88 with particular reference to the methods of the required inspection, its periodicity in terms of calendar time and flying time, and associated requirements for re-protection of the affected area of Piper PA-34 Seneca and PA-44 Seminole aircraft landing gear leg housings, with a view towards limiting the rate of associated gear leg failures. (Issued 21 July 1993).

Status – Accepted – Closed

CAA Action

CAA Additional Airworthiness Directive AD 002-01-88 has now been superseded by FAA AD 94-13-11. Whilst the replacement directive does not amend the method of crack detection, the FAA's logic that the existing method has proved adequate in America, has been accepted by CAA. On this basis, no additional action is planned.

CESSNA 172	FIRTH OF FORTH	02Apr93	ACCIDENT	9300974	93/14

References: Bulletin 8/93
FACTOR F28/93 dated 30Dec93

RECOMMENDATION 93-44

In accordance with the manufacturer's recommendation (SB 480), and therefore the LAMS schedule, the CAA should emphasise to all relevant personnel that Cessna 172 aircraft, fitted with 0-320 H series engines which have pressure screen type filters, are to be subject to engine oil changes/filter inspection (together with oil additive renewal) at periods no greater than 25 hours, or four months, whichever occurs sooner, and that all direct drive engines are subject to a maximum period of four months between oil changes/filter inspection, irrespective of filter type.

Status – Accepted – Closed

CAA Action

The Authority has amended LAMS Section 7 to better emphasise the need to check for manufacturers' recommended periods between oil changes. The amendment to LAMS became effective from April 1994.

JETSTREAM 32	PRESTWICK	21Jun92	ACCIDENT	9204093	93/15

References: Bulletin 11/93
FACTOR F3/94 dated 26Jan94

RECOMMENDATION 93-55

It is recommended that British Aerospace (Jetstream Aircraft Ltd.) review their Manufacturer's Operating Manual, Aircraft Flight Manual and associated flight training publications, to ensure that they reflect the importance of maintaining an acceptable level of Flight Idle torque during asymmetric power flight training exercises. The associated material should also be reviewed, in order to ensure that all pilots are aware of the possible adverse effects of incorrect Flight Idle power settings on aircraft handling and performance characteristics, especially those associated with McCauley propeller equipped Jetstream 32 aircraft. These effects, and their prevention, should be clearly noted as guidance to Training Captains in the appropriate section of the Manufacturer's Operating Manuals. The review should also consider, in consultation with the Civil Aviation Authority, the possible benefits of applying increased safety margins to the aircraft speeds associated with these exercises.

Status – Accepted – Open

CAA Action

Work is in hand, with the Authority considering the implications of the proposals in JAR-FCL and how they may impact upon this Recommendation. In the meantime, the Authority's Training Inspectors are continuing to ensure that Authorised Examiners consider the need for adequate speed margins and the avoidance of exceeding maximum pitch attitudes whenever they simulate engine failures in an aircraft.

THRUSTER MICROLIGHT	SANDOWN	27Jun93	ACCIDENT	9302061	93/17

References: Bulletin 11/93
FACTOR F12/94 dated 01Jun94

RECOMMENDATION 93-58

The CAA and the BMAA should review the strength of landing gear components on the Thruster and similarly configured microlight aircraft with a view to ensuring that damaging loads cannot be transmitted into critical parts of the aircraft structure as a result of associated ground contact forces, as required by BCAR Section 'S' which states 'Tail wheel and skids shall be weaker than the aeroplane structure to which they are attached.'

Status – Accepted – Closed

CAA Action

A report was produced by Tempest Aviation at the end of January 1994. The Authority has reviewed this report and concurred with the findings that an adequate margin does exist between tailspring strength and fuselage strength.

PIPER PA31	**BRISTOL LULSGATE**	**08Jul93**	**ACCIDENT**	**9302282**	**93/18**

References: Bulletin 12/93 dated 08Dec93
FACTOR F13/94 dated 01Jun94

RECOMMENDATION 93-61

The CAA should consider amendment of the Piper PA31 Maintenance Schedule to require renewal of the landing gear operating cable at fixed intervals, to preclude the fatigue failure of such cables.

Status – Accepted – Closed

CAA Action

The Authority's Letter to Operators No. 1317, issued in November 1993, recommended that the landing gear selector cable assembly be replaced every 5000 flight hours or at the next annual scheduled inspection, whichever is the sooner, and thereafter every 5000 flight hours.

Piper have now amended the Navajo Chieftain Service Manual to incorporate replacement of the landing gear selector cable every 4000 flight hours or every 10 years, whichever is the sooner. This supersedes the requirements of LTO 1317 which has therefore been cancelled.

AIRBUS A320	**LONDON HEATHROW**	**13Dec92**	**INCIDENT**	**9205125**	**93/20**

References: Bulletin 12/93 dated 08Dec93
FACTOR F4/94 dated 26Jan94

RECOMMENDATION 93-62

It is recommended that the CAA liaise with the DGAC in order to confer mandatory status on the Service Bulletin, CFM SB 80-003, which provides for rework of the air turbine starter on CFM56-5 engines. (Issued 23 November 1993).

Status – Accepted – Closed

CAA Action

The DGAC issued AD94-099(B) on 7 May 94, making the CFMI Service Bulletin mandatory.

RECOMMENDATION 93-63

It is recommended that the CAA liaise with the DGAC and review, for the CFM56-5 engine design, the protection from fire and overheat afforded to the Engine Control Unit (ECU) and the associated wiring harnesses. (Issued 23 November 1993).

Status – Accepted – Closed

CAA Action

The certification requirements state that a 'local event', (such as a starter fire), must not affect the behaviour of an electronic control system in such a manner as to cause a hazard to the aircraft.

The CAA and DGAC France have re examined the design and have concluded that the protection from fire and overheat offered to the ECU and associated wiring harness is adequate in ensuring that no hazard to the aircraft will be caused by such an event.

The CAA and DGAC France have concluded that the behaviour of the system in this case was consistent with the intent of the requirement.

FOKKER F27	**EDINBURGH AIRPORT**	**11Mar93**	**ACCIDENT**	**9300671**	**93/21**

References: Bulletin 1/94 dated 07Jan94
FACTOR F14/94 dated 24May94

RECOMMENDATION 93-76

It is recommended that the Civil Aviation Authority established 'Working Group' should progress with urgency their consideration of apron safety with a view to recommending a set of requirements/criteria for the management and operation of airport apron areas to be published by the CAA, thereby providing a standard against which apron operations will be audited and monitored. The CAA should also aim, in consultation with the HSE, to establish clear divisions of responsibility for the safe conduct of apron activity.

Status – Accepted – Open

CAA Action

The Working Group established by the Authority has continued to meet over the period since the last report. Further discussion with the HSE has resulted in their joining the Working Group as a full member. The first two parts of a new Civil Aviation Publication

(CAP462) titled 'Airside Safety Management', covering airside safety management systems and airside vehicle operation and driving, were made available to the industry in March 1995. A further five parts are planned and these are expected to be published during the course of 1995. One of these parts, dealing with the safety of individuals airside, is being provided by the HSE.

In addition, the Authority has undertaken considerable promotion of apron safety matters in recent months. Presentations have been given to the Aerodrome Operators Association Annual Conference, the National Air Traffic Control Conference, the Flight Safety Committee's Ramp Safety Seminar and to various airports and airport management organisations.

The Working Group expects to complete the production of the guidance part of its task towards the end of 1995.

Part 2 – AAIB Recommendations received during 1994

STOLP STARDUSTER	**ASKERSWELL, DORSET**	**03Oct93**	**ACCIDENT**	**9303468**	**94/01**

References: BULLETIN 2/94 dated 08Feb94
FACTOR F3/95 dated 24Apr95

RECOMMENDATION 93-70

It is recommended that the CAA should require that all flying and landing wire attachment bolts on UK registered Stolp Starduster aircraft be replaced with correct size bolts and, since limited rotation of the flying wire/spar attachment occurs, castellated nuts and split pins should be required.

Status – Rejected – Closed

CAA Response

The Authority does not accept this Recommendation. It is considered that the fitting of bolts of incorrect size, identified as having occurred on this occasion, is related to an error in the original construction of this particular aircraft rather than a problem which is endemic to the Stolp Starduster or to any other amateur built aircraft.

Despite some limited relative movement that occurs in most structural joints, bolts used in a structural application such as this (i.e. not part of a mechanism), would not be classified as being 'subject to rotation' as referred to in BCAR 23.607 and FAR 23.607. If they were, a mechanical as well as a friction locking device would be required. In this case, and small aeroplanes in general, the use of a stiffnut or a castellated nut and split pin is acceptable where the joint is not part of a mechanism.

RECOMMENDATION 93-71

It is recommended that the CAA require all UK registered Stolp Starduster aircraft to be fitted with detachable access panels in appropriate positions on the wings to enable the associated flying and landing wire attachments to be properly inspected for security.

Status – Rejected – Closed

CAA Response

The Authority does not accept this Recommendation. This would not be acceptable as it is common practice to slit and repair fabric for the purpose of maintenance inspections. Many types of aircraft have 'critical' bolts which cannot be inspected on a pre-flight walk around inspection.

RECOMMENDATION 93-72

It is recommended that the LAMS requirement (in Section 7) to 'Remove sufficient detachable panels and covers to inspect the internal structure of .... mainplanes .... 'at the 150 hour and annual checks, be amended to include the removal of sufficient fabric to enable adequate inspection of these areas.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The Authority has amended LAMS Section 7 to include a requirement for the removal of sufficient fabric to enable inspections to be made at the 150 hour and annual checks. The amendment to LAMS became effective from April 1994.

MS RALLYE 110ST	**WELLESBOURNE MOUNTFORD**	**18Aug93**	**ACCIDENT**	**9302857**	**94/02**

References: BULLETIN 2/94 dated 08Feb94
FACTOR F5/94 dated 30Mar94

RECOMMENDATION 93-73

It is recommended that the CAA, in conjunction with the French DGAC and the manufacturer of Morane Saulnier Rallye aircraft, introduce a requirement for the dye-penetrant inspection of the nose landing gear lower firewall attachment brackets (part number 880.21.0.456, and similar) on Morane Saulnier Rallye aircraft at a given interval, after any hard landing incident and after incidents of nose wheel shimmy.

Status – Accepted – Closed

CAA Response

The type and period of an inspection, together with the requirement for inspections after incidents of hard landings and nose wheel shimmy should be established by DGAC (France) as the Aviation Authority of the State of Manufacture. CAA has written to DGAC (copy to Socata) making proposals for follow-up action. A response is awaited.

CAA Action

Socata Service Bulletin SB152 was mandated by the publishing of DGAC France Airworthiness Directive AD94-182. This requires dye-penetrant inspection of the nose landing gear lower firewall attachment brackets on Morane Saulnier Rallye aircraft after a heavy landing or after experiencing serious shimmy during taxying.

AS350 SQUIRREL	**NR DOUGLAS, STRATHCLYDE**	**09Sep93**	**ACCIDENT**	**9303178**	**94/03**

References: BULLETIN 2/94 dated 08Feb94
FACTOR F24/94 dated 24Oct94

RECOMMENDATION 93-59

The CAA, in collaboration with DGAC of France, should require all operators of Arriel engines to conduct a critical review of the suitability, related to their particular mix of operations, of the manner in which they calculate and record partial engine cycles for gas generator overhaul life control. The review should be conducted with reference to Turbomeca General Service Letter No. 1323/89, Chapter 5 of the Maintenance Manual and in consultation with the CAA and the UK Agent.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation. CAA is liaising with DGAC (France) and Turbomeca to review Arriel engine cycle counting together with turbine blade life management methodologies.

It must be recognised that these measures cannot be expected to improve significantly the satisfactory Arriel engine failure rate, which is currently 0.011 per 1000 hours.

Furthermore, single engined aircraft are inherently vulnerable to loss of engine power or engine shut-down. Accordingly, the risk of a forced landing as a result of engine failure must be anticipated during any phase of flight on such an aircraft.

CAA Action

The CAA has sent a letter to all owners and operators of Turbomeca engines requesting those who use the published 'Recommended' method of calculating engine cycles to review, in conjunction with Turbomeca, their method of calculating cycles.

RECOMMENDATION 93-60

The CAA, in collaboration with DGAC of France, should review the basis on which Turbomeca has established the current service life of the 2nd Stage Turbine blades of the Arriel 1 engine and consider the need to monitor the consumption of that life by electronic means.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation. See Response to Recommendation 93-59 above.

CAA Action

The CAA in conjunction with the manufacturer and DGAC France has reviewed the method by which blade life is determined and concluded that it is satisfactory.

The CAA has established that the 2nd stage turbine blade which failed was to pre-modification TU118 standard. TU118 introduces a blade with a higher low cycle fatigue life. All pre TU118 standard blades have been removed from service in the UK fleet of Arriel 1D engines.

An electronic cycle counter (modification TU207) is now available from Turbomeca. However, the Authority considers that the current failure rate of turbine blades is satisfactory and does not warrant the mandatory fitment of the counter.

PIPER PA28-161	**NR WHITE WALTHAM**	**18Oct93**	**INCIDENT**	**9303695**	**94/04**

References: BULLETIN 6/94 dated 08Jun94
FACTOR F20/94 dated 29Aug94

RECOMMENDATION 94-07

It is recommended that the CAA liaise with the FAA and require procedures to be issued, for UK registered aircraft powered by the Avco Lycoming O-320-D3G and for other engines with similar crankshaft design features, for the mandatory inspection of the forward portion of the crankshaft bore aimed at detecting existing significant corrosion and/or cracking before any such effects progress to the point of crankshaft fracture. In parallel, mandatory procedures should be developed aimed at preventing subsequent corrosion.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation and has issued Airworthiness Directive 006-07-94 requiring periodic inspection of all direct drive Lycoming and Continental engines incorporating a hollow forward crankshaft. The periodicity is such that unacceptable corrosion will be detected.

AS332L SUPER PUMA	**GRYPHON 'A' PLATFORM – N SEA**	**22Dec93**	**INCIDENT**	**9304501**	**94/05**

References: BULLETIN 6/94 dated 08Jun94
FACTOR F21/94 dated 05Oct94

RECOMMENDATION 94-19

It is recommended that, in order to understand the incident phenomenon, the airworthiness authorities require Eurocopter to commission further work to determine the area in which deposits accumulate and the nature of the accumulation throughout the critical temperature range described in paragraph 6.4.1.9B of the AGARD Advisory Report No 223.

Status – Rejected – Closed

CAA Response

The Authority rejects this Recommendation. After a comprehensive investigation into the circumstances of this incident, it has been concluded that the flame-out resulted from an ingestion of accumulated snow or ice, as a result of abnormally extended ground running. The Authority is satisfied that revised flight manual procedures have resolved the issue.

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 – Accepted – Open

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.

BELL 206; TORNADO	**NR KENDAL**	**23Jun93**	**ACCIDENT**	**9302014**	**94/06**

References: AAR 2/94 dated 05May94
FACTOR F15/94 dated 07Jun94

RECOMMENDATION 93-47

The CAA should circulate a notice to those AOC holders involved in aerial surveys recommending that where practical they operate in the height band of 500 feet to 700 feet thus providing a degree of vertical separation from high speed low flying military aircraft which will generally operate below 500 feet.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

The Authority sent a letter to those AOC holders involved in aerial surveys on 17 August 1993. The letter recommends that, where practical, they should operate in the height band of 500 feet to 700 feet above ground level. This information is repeated in Aeronautical Information Circular 156/1993, entitled Helicopter Pipeline and Powerline Inspection Procedures, dated 21 October 1993.

RECOMMENDATION 93-48

The CAA should introduce a system of area notification of information to military crews involved in low level flying training that provides the timely distribution of civil aerial activity relating to the surveying of pipelines in the UK.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

The Pipeline Inspection Notification System (PINS) was introduced following several meetings under the auspices of the Directorate of Airspace Policy National Air Traffic Services. The meetings involved Ministry of Defence, the CAA's Safety Regulation Group, the energy companies and their associated helicopter operators. The height convention referred to under Recommendation 93-47 was introduced on 23 August 1993 whereby helicopter operators were advised to conduct pipeline inspections at an optimum height of 600 feet agl, plus or minus 100 feet. An AIC (156/93 – Yellow 126) together with a supplement to the Military Low Flying Handbook was published on 21 October 1993 introducing the notification to military pilots of helicopter inspection activity by major pipeline or geographical area. Work continues to develop these procedures which, when complete, will form the basis for a further AIC.

CAA Action

Work has continued on refining the Pipeline Inspection Notification System (PINS); a new AIC was issued by the Directorate of Airspace Policy, National Air Traffic Services on 11 July

1994. The revised PINS defines 3 “types” of pipeline inspection activity, and colour charts, which will be amended as required, have been provided to all of the helicopter companies engaged in pipeline inspection work.

RECOMMENDATION 93-51

The CAA should amend Rule 1 (1) of Rules of the Air Regulations 1991 so that the interpretation of ‘anti-collision light’ means in relation to any aircraft a flashing red or a flashing white light.

Status – Accepted – Open

CAA Response

The Authority accepts this Recommendation.

The Authority has discussed this matter with Industry informally, and will now carry out a full consultation process with the aim of amending Rule 1(1) of Rules of the Air Regulations 1991 in accordance with the Recommendation.

CAA Action

The Authority will begin a full consultation process by 30 June 1995.

RECOMMENDATION 93-52

The current review of CANP by the CAA should examine the existing separation criteria concerning overflights of sites notified under the procedure.

Status – Partially Accepted – Open

CAA Response

The Authority does not accept this Recommendation.

The Authority cannot accept this Recommendation in the form stated as the CANP is not currently under review.

CANP was last reviewed in 1993 and this resulted in the issue of AIC 124/93 (Yellow 117) on 26 August 1993. However, liaison on military low flying is continuing between the Authority and the Ministry of Defence and this will include the examination of existing separation criteria. Any relevant recommendations arising from the discussions will be taken into account in a further review of CANP to be conducted later in 1994.

CAA Action

The further review of the Civil Aircraft Notification Procedure (CANP) is about to take place although it is not anticipated that separation criteria will change. Model aircraft flying will, however, be added to the recreational activities which may be notified. The Automated Low Flying Entry and Planning Notification System (ALFENS), once operational, may allow a greater number of activities to be considered and notification times to be altered but experience of operating the equipment must be gained before such changes can be considered.

RECOMMENDATION 94-02

The Ministry of Defence and CAA should arrange for flow directions and choke points of the UK Low Flying System to be published on those topographical charts which are most commonly used by civil pilots.

Status – Rejected – Closed

CAA Response

The Authority does not accept this Recommendation.

The Ministry of Defence released to NATS relevant Military low-flying data early in 1993; it was a National Air Traffic Management Advisory Committee (NATMAC) consensus decision to depict it on the UK AIP RAC 5-0-1.1 Chart (Chart of United Kingdom Airspace Restrictions and Hazardous Areas). Accordingly, the 'flow arrows' and 'choke points' appeared for the first time on the Chart published on 1 September 1993. There are significant differences in flow directions between day and night low flying and during major exercises.

In addition, routine revisions can and do occur at more frequent intervals than can be accommodated within the normal topographical chart re-issue cycle. NATMAC has accepted that, for these reasons, there are risks involved in publishing flow arrows and choke points on topographical charts and that a sensible alternative is to depict them on the RAC 5-0-1.1 Chart. The manner in which this information is shown is being reviewed and it will be improved when the RAC 5-0-1.1 is re-issued in November 1994.

CAA Action

AIP RAC 5-0-1.1 (Chart of UK Areas of Intense Aerial Activity (AIAA), Aerial Tactics Areas (ATA) and Military Low Flying System) was re-issued on 24 November 1994 and shows Military Aerodrome Traffic Zones (MATZ) together with military Low-flying system flow arrows. This now makes the depiction of the Low-flying 'choke points' more meaningful.

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 (fast jets) with an aircraft collision warning system and the CAA should give similar priority to the research project for an electronic strobe detector.

Status – 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

A feasibility study commissioned by the Authority and completed in 1993 indicated that the principle of detecting strobe lights electronically was practicable. The Authority commissioned a further study in 1994 with a systems development consultancy to carry out ground and airborne measurements to confirm theoretical predictions. The research contract with that consultancy was completed in March 1995 but has identified specific areas requiring further investigation. An additional contract, which is due to be completed by August 95, has therefore been issued to study these areas. Ground and airborne measurements have produced encouraging results and resulted in the production of an improved detector system. This system has been used for airborne helicopter trials and for the characterisation of RAF fast jet strobes. The next stage of the work will be to manufacture a complete representative system for installation in an aircraft. An extended evaluation of operational effectiveness will take place together with an assessment of practical problems.

RECOMMENDATION 94-05

The Ministry of Defence and the CAA should examine the existing ATC communications available to civil/military aircraft operating in the open FIR to see whether the incompatibility of frequency bands adversely affects flight safety.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

The Authority will examine this issue jointly with the Ministry of Defence.

CAA Action

The examination called for by the Recommendation has now taken place.

Whilst the provision of a VHF frequency specifically for air to air use is unprecedented, such provision is technically feasible. However, the operational use of a VHF frequency by low-flying military aircraft and civil aircraft operating below 2000 feet agl is considered by the Directorate of Airspace Policy, National Air Traffic Services and the Ministry of Defence to be impractical. Any proposal that military pilots should transmit position reports, on a VHF frequency, at a rate which would provide meaningful information would significantly increase workload and have safety implications and could prevent them from accomplishing their primary task. Moreover, past experience of the common UHF frequency used for this purpose indicated that an inexperienced civil pilot monitoring the frequency would find it very difficult to maintain a recognisable mental picture of what is happening in his immediate vicinity from the data he obtained.

B737-2Y5A	**LONDON GATWICK**	**20Oct93**	**INCIDENT**	**9303741**	**94/07**

References: AAR 3/94 dated 10Jun94
FACTOR F18/94 dated 14Jun94

RECOMMENDATION 93-66

The lighting of runways and taxiways at Gatwick Airport should be re-examined with particular reference to the elimination of any possible confusion for pilots identifying Runway 26R/08L and Taxiway 2A. Recommended modifications include:

(a) Rendering the green centreline lighting of Taxiway 2 invisible to pilots on approach to Runway 26R/08L.

(b) The removal of the white strobe lights sited either side of Runway 26L/08R, which were originally installed to assist in the identification of this runway when 26R/08L was commissioned, leaving the strobe lights at the thresholds of 26R/08L in order to facilitate its positive identification.

Status – Accepted – Closed

CAA Response

The Authority has accepted both parts of this Recommendation.

(a) Full modification of the Taxiway 2 lighting (see Response to Recommendation 94-06 a) below) will take place concurrently with major engineering works scheduled to commence at the start of 1995. In the interim period a temporary arrangement will be introduced. An isolator switch, capable of switching off the Taxiway 2 green centreline lights, throughout its length west of the Sierra hold, will be available for use by ATC when Runway 08L/26R is in service.

(b) The white strobe lights sited either side of Runway 08R/26L have been removed. Therefore the white strobes fitted prior to the thresholds of 08L/26R are now unique to this runway.

CAA Action

The interim arrangements reported (reference sub para a) in the CAA Response were implemented and since that time the full modifications to the Taxiway 2 lighting by Gatwick Airport Ltd were completed in May 1995. Action under sub para b) was completed as reported previously.

RECOMMENDATION 93-67

The CAA should revise the content of the Gatwick ATIS broadcast in the light of the guidelines contained in ICAO Document 9426 (ATS Planning Document). Any advice concerning runway lighting and other identifying features when Runway 26R/08L is in use should be at the beginning of the broadcast rather than the end.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

Measures have been taken to ensure that prior to the reintroduction of Runway 08L/26R, the format of the Gatwick ATIS associated with the use of the runway will be amended in line with the guidelines contained within ICAO Document 9426. Accordingly, advice on runway lighting peculiar to Runway 08L/26R, i.e. the white runway identification strobe lights, will be transmitted immediately after details of the runway in use and runway surface conditions, rather than at the end of the broadcast.

CAA Action

The Gatwick ATIS broadcast is now in accordance with the guidelines contained in ICAO Document 9426. Any advice concerning the runway lighting and other identifying features when Runway 26R/08L is in use is now at the beginning of the broadcast.

RECOMMENDATION 94-06

A further review of the lighting at Gatwick Airport should consider in particular:

(a) The modification of the green centreline lighting of Taxiway 2 to make it uni-directional and switchable for the direction in use.

(b) The development of systematic procedures to manage the choice of lighting selections.

(c) Shielding, where possible, of all extraneous lighting so as to cause minimum confusion to approaching aircraft.

Status – Accepted – Closed

CAA Response

The Authority accepts all parts of this Recommendation.

(a) Full modification of the green centreline lighting of Taxiway 2 by the airport operator to make it unidirectional and switchable for the direction in use, is scheduled to take place simultaneously with major civil engineering work on the taxiway due to take place in early 1995.

(b) Systematic procedures to manage the choice of lighting selections have been developed and will be introduced prior to the return to service of Runway 08L/26R.

(c) The Authority will review the overall question of extraneous lighting with the airport operator in order to see where improvements can be achieved.

CAA Action

(a) Taxiway 2 was out of service for resurfacing until May 1995. During this programme of work bi-directionally switched taxiway centreline lighting was installed. This enables the taxiway lighting to be selected in one direction only, appropriate to the runway in use.

(b) Systematic procedures were developed to manage the use of taxiway lighting prior to the new work programme. These have now been replaced by new procedures to manage the modified lighting system now installed.

(c) During the conduct of airborne lighting inspections, personnel from the Authority's Aerodrome Standards Department took the opportunity to examine the question of extraneous lighting. A number of areas of interest were consequently investigated by the airport operator and have been satisfactorily addressed.

JET PROVOST	NR COLCHESTER	03Apr94	ACCIDENT	9401120	94/08

References: BULLETIN 7/94 dated 07Jul94
FACTOR F22/94 dated 20Oct94

RECOMMENDATION 94-10

Where the procedure for abandoning an ex-military aircraft differs from the procedure contained in the military-issued Aircrew Manual or Pilots Notes, the abandonment procedure should be published as an official supplement to the Aircrew Manual/Pilots Notes and approved by the Civil Aviation Authority.

Status – Partially Accepted – Closed

CAA Response

The Authority partially accepts this Recommendation.

Military issued Aircrew Manuals/Pilots Notes are not subject to CAA Approval. For new applications, and for subsequent renewal of existing annual Permits to Fly, the Authority will ensure that the Aircrew Manual or Pilots Notes, required by the conditions of the Permit, comply with the Recommendation by inclusion of an abandonment procedure if different from that contained in the Military Aircrew Manual.

RECOMMENDATION 94-11

The CAA should take action to require that all occupants of civil registered aircraft equipped with ejection seats, whether inhibited or not, receive appropriate training, information and certification regarding the use of the seats and the equipment installed on the seats such as parachutes and oxygen systems.

Status – Partially Accepted – Closed

CAA Response

The Authority partially accepts this Recommendation.

CAP 632 'ARRANGEMENTS FOR THE OPERATION OF EX-MILITARY AIRCRAFT ON THE UK REGISTER WITH A PERMIT TO FLY', requires appropriate training for all occupants of ex-military aircraft with regard to specialised safety equipment, including ejection seats. The Authority does not consider it necessary formally to certify persons for the use of such equipment.

RECOMMENDATION 94-12

The CAA should require all operators of aircraft fitted with inerted Martin-Baker ejection seats to take the seats out of the aircraft in order to remove completely the leg restraint lines from the seats. Before refitting the seats they should ensure that the cockpit floor in the area below the seat is completely free of obstructions.

Status – Rejected – Closed

CAA Response

The Authority does not accept this Recommendation.

The Authority's Letter To Operators No 1337, dated 8 April 1994, recommends that all seats are inspected for correct installation and security. If the leg restraint straps are correctly stowed it is considered there is no need for their removal. Removal of leg restraints is a modification and a matter of operator choice. Any such modification would require CAA approval as defined in BCAR chapter A/B 2-5. The clearance of cockpit floors before seat installation is considered to be normal good working practice.

RECOMMENDATION 94-13

The CAA, in conjunction with Martin-Baker Aircraft Co Ltd, should establish set procedures by which each particular ejection seat installation may be rendered inert if such action is desired and acceptable.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

Where seat inhibition is to be carried out, the actions taken will constitute a modification and should be applied for as defined in BCAR chapter A/B 2-5. The Authority, in reviewing the modification, will consider any inhibiting procedures in conjunction with Martin Baker, or a suitable approved design organisation, if applicable.

RECOMMENDATION 94-17

The CAA, in conjunction with Martin-Baker Aircraft Co Ltd, should establish the requirements for the examination of maintenance personnel in order to approve them as competent to work on both inert and live ejection seats in the civilian environment and require that all work on ejection seats, including their removal for access to other equipment and subsequent re-installation, must be carried out and certificated by such approved persons.

Status – Accepted – Open

CAA Response

The Authority accepts this Recommendation.

Owners and operators of ex-military aircraft over 2730 kg will be required, with effect from 1 January 1995, to have their aircraft maintained under the control of an organisation approved to BCAR chapter A8-20, published 17 May 1994. The requirements for approval of such an organisation cover the aspect of authorisation and training for servicing specialised equipment, including ejection seats. It should be noted that the CAA aircraft maintenance engineers licence is not applicable to Permit to Fly aircraft (CAA Notice No 3 refers).

CAA Action

The requirement for owners of ex-military aircraft over 2730kgs to have their aircraft maintained under the control of an organisation approved to BCAR A8-20 will be implemented from 1 July 1995.

RECOMMENDATION 94-18

The CAA should consider clarifying the wording of each Permit to Fly and its associated Operational Limitations such that the actions necessary to maintain the validity of the Permit are clear.

Status – Accepted – Open

CAA Response

The Authority accepts this Recommendation. The Authority will review and clarify the wording of each applicable ex-military aircraft Permit to Fly. The BCAR chapter A8-20 approval requirement will in itself clarify the actions necessary to maintain the validity of the Permit.

CAA Action

New Permit to Fly Certificates, with clarified wording, will be issued at the next renewal date after 1 July 1995.

CESSNA 550 CITATION II	**SOUTHAMPTON (EASTLEIGH) AIRPORT**	**26May93**	**ACCIDENT**	**9301595**	**94/09**

References: AAR 5/94 dated 12Jul94
FACTOR F17/94 dated 12Jul94

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 – Accepted – Open

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 Authority has completed a review of existing material on arrester beds and, in conjunction with Southampton Airport Ltd, agreed acceptable parameters for the installation of an arrester bed at Southampton Airport. It is currently conducting work to identify the levels of risk associated with overruns and on related issues associated with the provision of arrester beds and the specification of Runway End Safety Areas.

CESSNA 177	NR GUILDFORD	03Dec93	ACCIDENT	9304279	94/10

References: BULLETIN 8/94 dated 09Aug94
FACTOR F25/94 dated 25Oct94

RECOMMENDATION 94-08

It is recommended that the CAA requires Lycoming piston engines to be inspected to ascertain the modification standard of associated oil pumps, and that all oil pumps to SI 1230 standard (i.e. Woodruff key drive types) are required to be replaced with pumps of the latest standard as soon as practicable to prevent related engine seizure due to a sudden loss of drive/oil pressure.

Status – Rejected – Closed

CAA Response

The Authority does not accept this Recommendation. Single engined aircraft are inherently vulnerable to loss of engine power or engine shutdown. Accordingly, the risk of a forced landing as a result of engine failure must be anticipated during any phase on such an aircraft.

The FAA is currently working on an NPRM to amend the current FAA Airworthiness Directive requiring the replacement of all oil pumps to SI 1230 standard on Lycoming engines. The revised Directive will be automatically effective in the UK.

The Authority is unaware of any other instances of oil pump failure of this nature on Lycoming piston engines fitted to UK registered aircraft and considers that unilateral action by the CAA is not warranted.

BELL 206B	LUTON	15Jan94	ACCIDENT	9400108	94/11

References: BULLETIN 9/94
FACTOR F26/94 dated 27Oct94

RECOMMENDATION 94-27

It is recommended that the CAA and the FAA consider a requirement for the fitting of safety valves to the Pc sensing lines on all aircraft equipped with Allison 250 Series engines, in order to eliminate the need to remove and reattach the Pc line to the compressor diffuser during compressor washes.

Status – Rejected – Closed

CAA Response

The Authority does not accept this Recommendation.

As a result of previous occurrences the Authority issued in December 1992 an Airworthiness Directive requiring torque checking of all pipe end securing devices ('B' nuts) on the Allison 250 within 50 hours of receipt of the Airworthiness Directive and thereafter whenever the nuts are disturbed. It is not clear as to whether a log book entry was made indicating compliance with the Airworthiness Directive on G-BODW.

Further uncertainty as to maintenance practices on G-BODW is indicated by the differences in hardness between the contact areas at each end of the tube in question. There should be little difference, since the Allison manuals require the tube in question to be loosened at both ends during compressor washes, to avoid damage to the pipe caused by distortion.

For the above two reasons it is considered that previous maintenance of the engine may not have been in accordance with the relevant Allison manuals, or the CAA Airworthiness Directive.

A total of nine occurrences have been reported to the Authority where B-nuts were found loosened; five of these occurrences have been investigated by AAIB. All but two of these nine incidents are related to B-nuts which are located on the fuel control unit or power turbine governor. The isolation valve which can be fitted in the compressor delivery pressure (Pc) sensing line between the compressor scroll and the power turbine governor, will not affect maintenance practices on the other air pipes, and experience shows that loose B-nuts are more likely to be found in areas where access is difficult.

The Authority will strengthen the current Airworthiness Directive 010-12-92 to emphasise the leak check procedures which are already described in Allison manuals and to require that the B-nut torque values are recorded in the engine log book.

ATR42	LONDON GATWICK	11Feb94	ACCIDENT	9400517	94/12

References: BULLETIN 8/94 dated 09Aug94
FACTOR F19/94 dated 25Oct94

RECOMMENDATION 94-23

It is recommended that the CAA in conjunction with DGAC and the aircraft manufacturer consider requiring modification to ATR 42 (and ATR 72) aircraft to provide illumination of the hydraulic system caution caption on the centralised crew alerting panel in circumstances when pressure in either hydraulic system is lost while the aircraft is in operation.

Status – Accepted – Open

CAA Response

The Authority accepts this Recommendation. The Authority is already in discussion with both DGAC and the manufacturer on this issue.

The desirability of a warning to the crew via the Crew Alerting Panel (CAP) of the loss of hydraulic pressure is accepted.

RECOMMENDATION 94-24

It is recommended that the CAA in conjunction with DGAC and the aircraft manufacturer consider requiring modification to ATR 42 (and ATR 72) aircraft in order to maintain hydraulic supplies to the Normal Wheelbrake System in the event of de-energisation of both DC starter/generators.

Status – Accepted – Open

CAA Response

The Authority accepts this Recommendation. As a result of discussions with both DGAC and the manufacturer, a review in line with this Recommendation is being undertaken. Any such modification, which makes further demands on emergency power supplies, will need to address any possible degradation of other essential services.

RECOMMENDATION 94-25

It is recommended that the CAA conduct a review of UK registered public transport aircraft types, and UK operator practices, with regard to taxying with engines shut down. Such a review should consider the effect of possible further single systems failures on the operation of the wheelbraking and steering systems. The potential hazards which may exist should be evaluated.

Status – Accepted – Open

CAA Response

The Authority accepts this Recommendation and will conduct a review of UK registered public transport aircraft types and UK operator practices with regard to taxying with engines shut down.

When this review is completed the results will be analysed to identify possible further single systems failures affecting the operation of the wheelbraking, steering and other systems. The potential hazards identified will be evaluated.

CAA Action

UK operators have been canvassed for details of the practices they employ. A review of their responses is currently underway.

SHORTS SD330	**NORWICH AIRPORT**	**24Nov93**	**ACCIDENT**	**9304134**	**94/13**

References: BULLETIN 9/94
FACTOR F23/94 dated 21Dec94

RECOMMENDATION 94-21

It is recommended that the aircraft manufacturer and the CAA review the suitability of the wire locking arrangements specified in Service Bulletin SD330-28-35 with a view to ensuring that aircrew are able to select the engine LP fuel valves to the shut-off position during an emergency without the need to apply excessive force, having due regard to the problems of restricted access to the levers.

Status – Accepted – Open

CAA Response

The Authority accepts this Recommendation and is already in discussion with Shorts to review the break-out force of the locking wire.

PIPER PA31	**NR KINGS LYNN**	**07Jun93**	**ACCIDENT**	**9301801**	**94/14**

References: AAR 6/94 dated 12Oct94
FACTOR F27/94 dated 15Nov94

RECOMMENDATION 94-28

Airworthiness authorities and manufacturers should ensure that when Airworthiness Directives and Service Bulletins are issued which contain important safety information which is also relevant to pilots, additional measures are taken to ensure that such pilots become aware of the relevant information.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation.

When Airworthiness Directives and Service Bulletins are issued which contain important safety information which is also relevant to pilots, the Authority regards it as an operator responsibility to take any additional measures necessary to ensure that the pilots become aware of the information. Public Transport operators will be reminded of their responsibilities by the issue of a Notice To Air Operators' Certificate Holders. Safety information which is immediately relevant to pilots is directed by the Manufacturer or Regulatory Authority to the Manufacturer's Operations Manual or Flight Manual as appropriate.

CAA Action

Notice to Air Operators' Certificate Holders 1/95, dated 16 January 1995, reminds Public Transport Operators to promulgate safety related information to pilots in a timely manner.

RECOMMENDATION 94-29

When Airworthiness Authorities issue Airworthiness Directives (ADs) that require compliance with a manufacturer's Service Bulletin (SB), such ADs should be updated when the manufacturer updates the SB, or clearly state that the AD relates to the latest issue of the associated SB at any point in time.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation; effectively these provisions are already in place.

The Authority can only respond in relation to its own procedures and in the case of both CAA Airworthiness Directives, raised against products of UK manufacture, and CAA Additional Airworthiness Directives, raised against products of foreign manufacture, these procedures already meet the intent of the Recommendation. The Forewords to the CAA Mandatory Aircraft Modifications and Inspections Summary (CAP476) and the CAA Additional Airworthiness Directives (CAP473) clearly specify that a later issue of a Service Bulletin becomes applicable, unless it is expressly stated otherwise in the directive.

RECOMMENDATION 94-30

The CAA and FAA should seriously consider issuing Airworthiness Directives to make manufacturers' strong recommendations to replace components a mandatory requirement where it is apparent that failure to replace such components could result in a potentially major hazard to the safety of affected aircraft.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation; effectively these provisions are already in place.

The Authority can only respond in relation to its own procedures for the raising of Airworthiness Directives and Additional Airworthiness Directives and these already take full account of strong recommendations made by the manufacturer to replace components whose failure could result in a potentially major hazard to the safety of affected aircraft.

RECOMMENDATION 94-31

Airworthiness authorities should require that detailed stress analyses and direct strain gauge monitoring are carried out on all propeller hubs as part of the associated Certification Requirements.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation; effectively these provisions are already in place.

Current CAA certification requirements are contained in JAR-P Change 7, which requires direct measurement of vibratory loads followed by detailed stress analysis of the results.

KOLB TWINSTAR MK3 MICROLIGHT	**STRADBROKE, SUFFOLK**	**21Jul94**	**ACCIDENT**	**9403003**	**94/15**

References: BULLETIN 11/94
FACTOR F30/94 dated 19Dec94

RECOMMENDATION 94-35

The CAA require that the modification to the carburettor needle fixture on Rotax engines be made retrospective and mandatory, and that in the meantime the 50 hour check be also made mandatory.

Status – Rejected – Closed

CAA Response

The Authority does not accept this Recommendation. This is a defect that has occurred on a very small number of Rotax engines, and the failure rate is consequently low. The Rotax maintenance schedule specifies inspection at fifty hour intervals to check for wear at the circlip groove and at the jet, since progressive wear at the jet is normal and the needle is regularly inspected even apart from the circlip groove wear problem.

There is no evidence to suggest that the wear can reach a dangerous level within the fifty hour interval. It is therefore the view of the Authority that the problem can be adequately controlled by the inspection procedures currently in place.

Microlight engines are not required to be Type-Certificated and BCAR Section S only requires that reliability testing take place as part of the complete installation; consequently, their use is restricted to aircraft that are assessed as having acceptably safe forced landing characteristics.

RECOMMENDATION 94-36

The CAA consider a requirement for the provision of better protection to the occupants of the Kolb Twinstar in the event of a heavy landing.

Status – Accepted – Closed

CAA Response

The CAA accepts this Recommendation. The PFA, on behalf of the Authority, and in conjunction with the UK kit supplier, Mainair Sports, are reviewing the undercarriage design with regard to compliance with the appropriate requirements of BCAR Section S. In addition, they are investigating a means of improving the seat design by the incorporation of a more rigid seat and energy-absorbing cushion.

CAA Action

The PFA, on behalf of the Authority and in conjunction with the UK kit supplier, has carried out a review of the Twinstar undercarriage design and found it to be compliant with the BCAR Section S requirements for both strength (S 474) and emergency landing (S 561). The condition of the aircraft after this accident implies that the crash loads were significantly in excess of those catered for by these requirements. which are felt to adequately cater for controlled landing conditions. It is not considered necessary to review the undercarriage requirements of BCAR Section S.

With this particular aircraft, the positioning of the seats is such that in the event of a collapse of the undercarriage, there is little or no clearance from the ground and the seat construction is such that it offers minimal impact protection. This is regarded as a hazardous combination of features, and in accordance with BCAR S 2(b) an appropriate means of improving occupant protection is being sought. The resulting modification will be required on all UK registered Twinstar aircraft.

AS355FI TWIN SQUIRREL	**STAPLEFORD TAWNEY AERODROME**	**07Jul94**	**ACCIDENT**	**9402792**	**94/16**

References: BULLETIN 11/94
FACTOR F29/94 dated 19Dec94

RECOMMENDATION 94-37

The CAA should, in conjunction with the aircraft manufacturer, review the wording given in the manufacturer's Flight Manual for the AS355, and similar types, of the pilot action to be taken in the event of a tail rotor gearbox chip detector warning.

Status – Accepted – Open

CAA Response

The Authority accepts this Recommendation. The manufacturer has been advised that the AS355 Flight Manual wording is inconsistent with that used for other of their helicopter types and the industry in general for this type of emergency procedure. Eurocopter has been requested to carry out a review and advise the Authority of their proposed action.

CAA Action

Eurocopter is carrying out a review of Flight Manual wording at the Authority's request and when completed the Authority will consider the need for Flight Manual amendments.

PA34-200T	BEVERLEY AIRFIELD	01Jun94	ACCIDENT	9402080	94/17

References: BULLETIN 11/94
FACTOR F28/94 dated 30Dec94

RECOMMENDATION 94-32

It is recommended that the CAA reconsider with the FAA a requirement for the main landing gear mechanism on all PA-34 aircraft to be fitted with the larger diameter studs and modified brackets on the sidestay assemblies.

Status – Accepted – Closed

CAA Response

The Authority accepts this Recommendation. The FAA issued Advanced Notice of Proposed Rulemaking (ANPRM) Docket No 93-CE-61-AD on 17 Feb 94, covering PA24, PA28R, PA30, PA32R, PA32RT, PA34-200, PA34-200T, PA39 and PA44 series aircraft. This addresses the requirement for a periodic check of the swivel pins (studs). FAA requested responses by 10 May 94, but have yet to report on their consultation. Only two cases of cracked swivel pins have been reported in the US. Based on the relatively low rate of occurrences on a fleet of 4500 aircraft, the manufacturer does not plan to issue a Service Bulletin.

It is likely that the greater use of grass fields in the UK gives rise to a larger number of defects, thus justifying the issue of an Additional Airworthiness Directive. The CAA proposes to await the outcome of the FAA ANPRM, before taking action on the AAD. If the outcome is judged not to address the UK problem adequately an AAD will be issued.

AA5	N WILLINGHAM	09Oct94	ACCIDENT	9404298	94/18

References: BULLETIN 1/95
FACTOR F4/95 dated 17Jan95

RECOMMENDATION 94-58

Whilst it is recognised that no system of medical examination will detect all cases of significant cardiac disease, it is recommended that the Medical Division of the CAA should review the cardiovascular requirements of the medical examination and certification of elderly private pilots. The review should consider the current international standards and recommended practices and the proposed JAA medical standards.

Status – Accepted – Open

CAA Response

The Authority accepts this Recommendation.

The Medical Division will undertake a review of the current UK cardiovascular examination standards of elderly pilots. The latest medical data available will be reassessed to determine the safety risk and at the same time a comparison will be made between UK standards, those of ICAO, those of other Regulatory Authorities and the proposed JAA standards. If indicated, UK medical requirements will be amended in the short term and, for the longer term, proposals will be made to the Joint Aviation Authorities whose standards are, on current plans, to be implemented no later than 1 January 1998 throughout all the member states.

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