

A strategy for human factors in civil aviation

2014–15

Updated March 2014

© Civil Aviation Authority 2014

All rights reserved. Copies of this publication may be reproduced for personal use, or for use within a company or organisation, but may not otherwise be reproduced for publication.

To use or reference CAA publications for any other purpose, for example within training material for students, please contact the CAA for formal agreement.

CAA House, 45-59 Kingsway, London WC2B 6TE
www.caa.co.uk

Contents

Foreword	2
Introduction	3
Context	4
Applicability	5
Vision	6
Policy	7
Regulation	9
Implementation	11
Standards	12
Training	13
Assurance	15
Data, analysis and research	17
Communication and promotion	19

Foreword

Thank you to all who contributed to the consultation on our Human Factors (HF) strategy. In launching this revised HF strategy, we are focusing on delivering the strategy in collaboration with all the communities and domains that make up our varied aviation industry. Our aim is to provide the necessary tools, direction and support in this important area for aviation safety. The strategy is designed to be a living document and we will review it regularly to keep it aligned to our Safety Plan, which in turn is linked to our State Safety Programme and to the European Aviation Safety Plan.

Human Factors and our understanding of its effects on safety performance continue to evolve and develop. We must continue to question the effects of HF through working with our stakeholders and keeping abreast of research and work in this field. As a regulator, we are seeking to develop more robust and risk-based methods of reviewing and responding to the ever-changing aviation environment and the challenges this brings to aviation safety, keeping the interest of the consumer at the heart of our work.

The impact of HF cannot be simply solved through a set of prescriptive requirements or set of procedures. To make a difference, we must also influence attitudes and behaviours and embed HF thinking into everything we do, not to see it as something that is done separately. The CAA is therefore committed to improving its knowledge, to seek out best practice in order to identify and enhance human performance. A key part of this information gathering is to share it with you and to develop generic guidance that can provide direction and support.

You will see that, as a result of the consultation, we have changed some of the text and layout of the strategy but have retained the sections and structure. We have underlined our high level actions for each section to clarify these as our goals for success. Human Factors is not something that we can do on our own, and each of us from the General Aviation pilot to the large airline or the designer of airspace needs to play their part in managing factors that may affect human performance. This strategy outlines our vision and direction to achieve an effective joint approach in supporting the most important element in the aviation system: the people.



Mark Swan

Group Director Safety and Airspace Regulation UK Civil Aviation Authority

Introduction

Human error is identified as the main cause or contributory factor in approximately 75% of all aviation accidents and incidents. In recognising the importance of HF throughout the whole aviation system, we can continue to strive for a better understanding of the human condition and the application of error prevention.



This strategy aims to bring consistency across the industry, promote positive attitudes and develop the CAA's transition to performance-based oversight. There are many published examples of how HF awareness increases efficiency, reduces error and can provide significant returns on investment. These cost savings, along with an obligation towards safety and a robust Safety Management System (SMS), should provide an incentive for organisations to embrace the strategy and develop their HF programmes.

The strategy has been developed in line with the European Strategy for Human Factors in Aviation, the UK State Safety Plan and CAA Strategic Plan.



Context

The UK aviation industry is held to a high standard of safety by the public, and, while it is one of the safest aviation industries in the world, work must continue to improve historic safety rates and mitigate new threats as they emerge. This must be done among the economic pressures faced by all, from the regulator and operators, to non-commercial organisations and individuals.

Resources must be applied efficiently, in a way that accounts for the different risks and HF issues that individuals or organisations face. Understanding and addressing HF issues can deliver safety benefits greater than the financial investment made.

Applicability

The strategy applies to everyone in the aviation system that has an impact on flight safety. This includes those involved in design and manufacture of aircraft, service providers, engineers, pilots (both General Aviation (GA) and commercial), air traffic controllers (ATC), rule makers and regulators. The strategy in itself is not new regulation, it is setting the CAA's approach to HF in a consistent way across communities by applying a non-constraining, risk-based approach.



Vision

- Everyone involved in civil aviation understands the importance of human performance in aviation safety.
- HF understanding is visibly demonstrated through appropriate attitudes and behaviours which result in a reduction of human error in the system.
- Co-operation between design, manufacture, operations, training, reporting, investigation and analysis to trap and mitigate adverse HF.
- Reduce the risk of potential mismatches between the required level and actual level of human performance within the working environment.



Policy

Direction

We will work to communicate HF in a way that all communities can understand and relate to. This common understanding should translate into focused, sustainable and practical tools and guidance aimed at improving safety performance.

We will work with industry, academia, professional bodies and associations, trades unions and others to ensure we have a coherent approach for HF across UK civil aviation.



Our HF programmes must be allocated in response to appropriate risks. We will be innovative and flexible in seeking evidence from the aviation communities that HF risks are being mitigated in relation to the task being performed.

We will develop the necessary provision to encourage and facilitate good practice and be flexible in our approach when assessing best practices.



Collaboration

The progression of a culture of HF development varies between organisations and communities. We are committed to providing leadership and support so that all communities can align development of their HF plans to this strategy. HF should be integrated with day-to-day activities, and incorporating HF into SMS is an essential step in developing a mature approach to HF.

Priority outcome

We want SMS to start to demonstrate that HF is integrated with its activities and is contributing to a positive safety culture.

Actions

- Produce practical tools and guidance.
- Create focused HF programmes based on identified risks.
- Use SMS to provide evidence of HF considerations and culture.
- Ensure CAA staff are trained in HF and able to assess and provide best practice guidance.

Regulation

Direction

We will continue to work with the International Civil Aviation Organization (ICAO) and the European Aviation Safety Agency (EASA) and influence them to develop appropriate, effective and sustainable regulation that places HF programmes central to enhancing safety performance. This regulation should be broad and non-constraining and recognise the need to encourage industry to focus not only on compliance but on the safety outcomes within their operational context.

With the introduction of a dedicated General Aviation unit within the CAA, we will provide relevant information and support to the GA community while maintaining the CAA's commitment to reduce regulatory red tape in all areas.





Collaboration

We will work with all communities on developing HF capability either where there is direct regulatory requirement or through promoting best practice. This work will include developing provision of guidance material to achieve an appropriate degree of HF performance and standardisation.

Through oversight, we will seek evidence of the performance of HF programmes as appropriate within each community. Oversight will seek to identify that HF has developed real benefit in a sustainable manner and share lessons learned.

Priority outcome

To remain active in influencing European and global approaches to HF across regulation.

Actions

- Encourage EASA when developing acceptable means of compliance (AMC) and guidance material (GM) to give consideration to HF.
- Collect and share evidence of best practice across communities.
- Continue to work with European and international bodies to promote HF best practice throughout aviation.

Implementation

Direction

We will establish single focal points of contact for communities within the CAA to allow for co-ordination and promotion of good practice.

As part of improvements to HF competence within the CAA, leadership and focal points within each community and domain are to complete thorough HF training. This training will aim to provide a detailed understanding of HF principles within their field and equip them with the facilitation skills to support colleagues and external stakeholders.

We are working to integrate HF into SMS and will produce framework and implementation documents to guide the process.

Collaboration

We will foster a network of external HF contacts which, where necessary, can be called on for support around significant areas of HF development.

In keeping with a Just Culture, where everyone is responsible for safety, we want to be open in collaborating with organisations or individuals. We will encourage contributions to HF and the strategy through appropriate channels. We will work to use these contributions to enhance and promote safety, develop an open culture and encourage ownership of individual and community responsibilities.

Priority outcome

We want to see a better understanding of HF within the CAA and industry. By promoting leadership and ownership in an open manner externally we hope to see a reduction in HF incidents and fulfil the commitments of the CAA Strategic Plan.

Actions

- Develop and publish an action plan for HF.
- Train CAA focal points within each domain.
- Integrate HF standards with SMS.
- Develop a network of external HF contacts.

Standards

Direction

We will encourage all standards, codes of conduct and best practice within the aviation safety system to embrace HF in mitigating identified safety risks.

The quality of training is a key component in the aviation safety system. Ensuring that HF training standards are actively developed and routinely updated is a key part of current and ongoing work (see training section).

Collaboration

Within a safety system people will not always behave in a way that the system expects or is designed for. Setting standards, codes of conduct or best practice demonstrates the expected levels of knowledge, skills and behaviours in relation to the level of risk involved. Each community should establish relevant standards that reflect the nature of its specific operation and level of risk. We should ensure that the industry standards are consistent with best practice identified across the whole safety system.

Where appropriate, communities should express these standards for individuals and groups in terms of competencies.

In our continuing work with EASA we want to see standards developed that reflect the changing aviation environment.

Priority outcomes

We will encourage the development of industry-wide standards that reflect the nature of the task and the level of associated risk.

Actions

- Promote standards made to be consistent with best practice.
- Continue to work with EASA to see standards developed that reflect the differing environments.
- Work with communities in developing generic competency frameworks.

Training

Direction

HF training should be tailored and relevant to the specific needs of communities and individuals. It should share a common language and framework so that it can be understood by everyone.

Although regulation already prescribes some training requirements, we will still expect that an organisation's SMS is also used to identify their own HF training needs. Using both these sources, industry should develop their specific HF training needs accordingly.



The competency of the trainer is essential to ensuring effective outcomes. Good guidance material is ineffective if the person delivering it is not fit for the role. Additionally, the method by which the training is delivered is important. Primarily, this should be delivered by a qualified and credible person. Being able to encourage appropriate behaviours and attitudes is important and we want to see promoters of HF supported and encouraged by managers.



Collaboration

Communities using a service provider for HF training should establish their credibility and competence based on their ability to deliver the necessary specific requirements. Evidence of relevant and practical competency-based training should be provided to the CAA as part of oversight activity. In turn we will establish HF training for regulatory staff to support our pledge of risk-based safety performance. Over time this will develop our regulatory HF capabilities in support of all communities.

Training emphasis should be placed on risks identified by the CAA and those identified by the community, organisation or individual. Particular attention should be placed on an integrated approach to HF training with regard to automated aircraft and equipment.

Priority outcomes

Our aim is to see everyone within aviation receive appropriate HF training according to their role.

Actions

- Develop a common language and framework for training.
- Emphasise practical relevance in refresher training.
- Integrate HF training with other communities.
- Develop further specific guidance to be made available on the CAA website.
- Consider CAA's Significant 7 in HF agreed actions.
- Assess impact of automation and technology in HF training and development.

Assurance

Direction

Through SMS oversight we will move towards performance-based assessment of HF to confirm that HF risks are being mitigated effectively.

We will consider the overall performance of HF programmes, teams and individuals within a community in determining the effectiveness of cumulative HF risk mitigation.

We will monitor how social and commercial behaviours influence human performance such that an acceptable level of safety can be demonstrated.

Collaboration

We will seek evidence of performance-based assessment during oversight activity.

All communities/domains should develop means of systematic local observation of safety critical tasks, which is complementary to normal reporting, in order to validate occurrence trends and confirm the effectiveness of HF programmes. We should seek evidence of effective systematic local observation during evaluation of SMS performance to add confidence to assessments that the right risks are being identified and managed.

We will seek to work with the communities to develop an understanding of the impact of social and commercial influences on human performance.



Priority outcome

We expect that assurance of HF programmes will be culturally embedded within the development of SMS.

Actions

- Develop performance-based assessment of HF programmes.
- Develop means to observe HF in safety critical tasks during normal operations.
- Develop a method of seeking evidence of an integrated approach to HF during SMS oversight.

Data, analysis and research

Direction

We are applying a methodology with industry groups that allows organisations to visualise risks in their operations effectively. Bow-tie analysis allows identification and assessment of the key safety barriers between a risk event and a hazardous outcome. This is part of our ongoing Enhancing Safety Programme (ESP) and includes development of a specific HF model, to enable an organisation to evaluate their risk as part of an effective SMS.

We will work with ICAO, EASA and other national authorities to establish a common HF taxonomy to extract meaningful HF information from reported data. Through continued promotion of an open reporting culture and investigating the reasons behind non-reporting of safety occurrences we hope to find and address the causes of unreported occurrences.

Collaboration

Communities should continue to evolve and promote their HF reporting, investigation and analysis in a manner consistent with their SMS. They should reflect good practice and be compatible with European Coordination Centre for Accident and Incident Reporting Systems (ECCAIRS) HF taxonomy. We will continue to work on updating ECCAIRS HF taxonomy to provide better causal HF information. This will be in a common HF language that is accessible across all communities.

Our research programme should, where appropriate, include elements of greater HF understanding.

We will seek evidence from industry that reporting, investigation and analysis captures appropriate HF risks during oversight activity.



Priority outcome

We want to see further development of specialist HF capability within the CAA that can promote and guide HF development internally and externally.

In turn we wish to see the quality and coverage of the information and research within the aviation community develop, and see a new proactive approach to gathering HF information.

Actions

- Publish bow-tie analysis for HF and supporting material.
- Support research into understanding trends in safety reporting.
- Update ECCAIRS taxonomy to provide better causal HF information across all communities.

Communication and promotion

Direction

We will promote the development of an open culture for sharing information and best practice. We will establish and maintain an open-access online repository for HF tools and guidance material as well as useful contact information on the CAA website.

We will promote HF programmes within SMS to encourage a just and open safety culture throughout civil aviation. Relevant HF feedback and lessons learned from SMS can be scaled appropriately into initiatives to aid communities who may not have direct involvement, such as non-complex private GA.

Collaboration

The design, production, communication and promotion of HF tools and guidance material will be relevant to the size and complexity of a particular SMS. We will work with the different communities to develop appropriate promotional material. In the case of recreational aviation, it should focus on appropriate attitudes and behaviours and be freely available and provided to licence holders, clubs and other interested parties.

The CAA should seek evidence of effective HF safety promotion during oversight activity so that future efforts can be channelled in the most efficient and cost-effective manner.

Priority outcome

Our goals are to see the aviation community promote and demonstrate best practices in terms of HF and safety culture. We will provide support to the communities to deliver this outcome.

Actions

- Produce and share practical tools and guidance.
- Combine and promote HF within SMS.
- Seek evidence of effective promotion methods and back their use.