# 2012 European Strategy for Human Factors in Aviation

This Strategy has been developed by the European Human Factors Advisory Group

EHFAG
European Human Factors
Advisory Group

First Issue
1 September 2012

# European Strategy for Human Factors in Aviation

**Vision**

Human factors principles will be fully integrated in the strategic and day to day activities at individual and organisational levels to improve aviation safety and operational effectiveness.

**Introduction**

The current aviation system is extremely safe, with thousands of successful operations every day. The entire aviation system relies on the behaviours and performance of individuals and teams for safety, efficiency and effectiveness. However, human error continues to be cited as a major factor in aviation accidents and incidents. Successfully addressing human error must consider that error is often a symptom of systemic and organisational issues, with multiple factors involved that affect human performance.

Human Factors is 'anything that affects human performance', and it cuts across the entire aviation system. Finding ways to improve human performance can have a significant positive impact on aviation safety and operational effectiveness. The European Aviation Safety plan (EASp) recognises this by calling for a European Human Factors Strategy. This European Human Factors strategy has been developed by the European Human Factors Advisory Group (EHFAG) working in close conjunction with EASA. It also considers the industry feedback from EASA Human Factors Questionnaire from December 2009.

Human factors and the performance of individuals and organisations affect all aspects of aviation and should not be addressed in isolation.

**Purpose**

The Strategy sets out to achieve two principal functions. First, to foster consistency in the integration of human factors principles in the regulation, governance, system design, training, licensing, audit and assurance of aviation activities. Second, it outlines how the practical understanding and application of human factors can serve in enhancing safety performance across the aviation safety system.

The Strategy serves as a framework document to support the European Safety Plan (EASp). With this foundation, the EHFAG will develop an action plan that applies the Strategy including appropriate priorities and resources.

**Aims and Objectives**

The overall aim of the Strategy is to improve aviation safety and operational effectiveness through integrating human factors in all aviation activities. The objectives are to:

- Recognise the positive and negative role of human performance in aviation safety and operational effectiveness.
- Encourage implementation of human factors principles in aviation activities and appropriate regulatory material.
- Apply and incorporate human factors principles in safety analysis and safety management, and facilitate the use of appropriate methods and metrics.
- Educate and inform the aviation workforce, including regulators, pilots, controllers, maintainers, designers (including manufacturers and Original Equipment Manufacturers), ground-operators, managers, and others about human factors and lessons learnt in safety and operations.
- Support research to provide human factors data for future aviation safety and operational needs.
- Ensure appropriate action is taken when known human performance related risks are identified

Effective Human performance is fundamental to operational safety in aviation. It needs to be integrated into all aspects of aviation including equipment and system design, procedures, training and competency, etc and should not be considered in isolation. It should also be addressed in future airspace concepts such as Single European Sky ATM Research (SESAR) and NextGen.

It applies to regulators, industry and investigators as follows:

**For Regulators**

It is the intent for EASA, European National Aviation Authorities (NAAs) and other regulatory organisations to understand, embed and integrate human factors into their activities. These activities include:

- Development and application of regulation and guidance, with an appropriate balance between rule, Acceptable Means of Compliance (AMC) and guidance material.
- Approval and oversight of regulated organisations
- Certification of products and equipment
- Safety data collection and safety analysis
- Accident and occurrence investigation and processing of safety recommendations.
- Safety promotion through human  factors advice, education and information exchange
- Standardisation of the oversight of human factors and error management  across Europe
- Supporting research and development
- Encouraging and promoting effective safety reporting systems

**For Industry**

It is intended that any person or organisation involved in the aviation system understands and applies human factors in all activities and operations. These include:

- Addressing human factors in organisational activity and service provision
- Addressing human factors in system design
- Implementing open and voluntary reporting systems
- Collection and analysis of data
- Investigations of events to identify both technical and HF causal and contributing factors
- Identifying and mitigating human performance related risks
- Development of effective interventions (both human and technical)
- Providing an appropriate level of human factors training to staff including management
- Integrating human factors into the Organisation's Safety Management System (SMS), to include positive and pro-active indicators of operational safety

**For Accident Investigators**

It is intended that human factors be assessed in accident and serious incident investigations. This includes;

- Assuring an appropriate level of human factors expertise is applied in the investigative process
- Assessing human factors issues, including organisational and systemic factors, as part of investigations
- Considering human factors in resulting safety recommendations

**Scope and Applicability**

This document applies to all persons or organisations involved in, or contributing to the European aviation system, including rule makers, authorities, investigators, researchers, service providers, industry and other stakeholders.

This includes flight operations, aerodrome operations, air traffic and air navigation services, equipment design and certification, initial airworthiness and manufacturing, aircraft maintenance and continuing airworthiness management, ground handling, personnel training and qualification. It does not identify specific tasks or resources that make up such HF activities. It is the responsibility of all those who direct and manage aviation safety to implement an appropriate approach to human factors within their own organisations as part of an integrated European Human Factors Strategy.

**Timeframe**

This Strategy has been developed for 2012 to 2022.

**Guiding Principles**

The aims and objectives will be achieved by using the following guiding principles:

1. **Providing appropriate Governance and Leadership**
   There will be appropriate governance on how HF is managed and coordinated across Europe. This would include consideration of appropriate HF expertise within the regulatory organisations.

   EASA and the European Commission should play a key role in leading and managing the implementation of this European HF Strategy, and of the safety improvement initiatives and actions arising from this strategy.

2. **Developing a balanced Regulatory Structure**
   Human Factors principles will be addressed in all the aviation regulations whilst recognising the need for the regulation to be proportionate with an appropriate balance between rule, Acceptable Means of Compliance (AMC) and guidance material.

   Appropriate regulations will be developed that result in organisations managing Human Factors and human performance within the workplace. This should include consideration of HF issues in the organisation's SMS and change management processes.

3. **Providing guidance and interpretive material**
   Adequate tools, guidance and AMC material to help industry apply human factors principles will be provided.

   Also adequate guidance and assessment tools to help regulators oversee the effective implementation of human factors by industry and in incident and accident investigations will be provided.

4. **Promoting the importance of Human Factors**
   Ensuring the aviation community recognise that embedding human factors also improves operational effectiveness.

   Human factors principles will be promoted at a European level through the EASA website, regular newsletters and bulletins and European and EASA Conferences.

   Human factors principles will be promoted at a National level through cascading of EASA promotion and national conferences. This should include the sharing of successful intervention strategies.

5. **Coordinating activities**
   Activities will be coordinated across organisations including regulatory
   organisations to avoid the transfer of risk from one domain to another.
   - This co-ordination should be across both European and non-
     European Aviation Systems (e.g. with FAA).
   - This should also include co-ordination with other safety
     organizations and initiatives such as European Strategic Safety
     Initiative (ESSI), Advisory Council for Aviation, Research, innovation
     in Europe (ACARE) and Eurocontrol and the implementation of Safety
     Management Systems.
   - EASA and the EHFAG should seek opportunities to influence and
     coordinate human factors activities with International bodies such as
     ICAO

6. **Sharing of lessons learnt**
   Lessons learnt come from many different sources including accident
   investigations, data analysis and operational experience.  Methods are
   needed to share lessons learnt.

**Next Step; Developing an Action Plan**
The EHFAG will develop an action plan from this strategy (HFP1.2 of the European
Aviation Safety Plan) that will convert the strategy into a detailed HF programme by
the end of June 2013.  Significant actions will be included in the European Aviation
safety Plan. Priority of tasks and actions will be based on the impact to the overall
improvement of safety performance. See Appendix

**In Conclusion**
This strategy provides a vision of the future activities that are needed to be
addressed for human factors to be fully understood and applied across the aviation
system.  It encourages a shared approach to addressing human factors so that all
stakeholders can understand its purpose and expected benefits.

# Appendix

**The Action Plan will include the following themes:**

**Collection and Analysis of Data and Lessons Learnt**
- Safety related events should be investigated in a way that Human Factors aspects are identified and addressed.
- Encourage the sharing and analysis of safety data within communities across Europe through groups such as the Network of Analysts.
- Review and revise as appropriate existing Human Factor taxonomies to establish a common understanding of terminology to assist in the further analysis of safety related events by coordinating with existing taxonomy working groups.
- Providing guidance on the application and interpretation of 'Just culture' to enable improved levels of open reporting.
- Provide guidance on developing effective safety reporting systems
- Ensuring analysis of safety data is further used in identifying future research activities.
- Cross-fertilisation of tools and practices across aviation and non aviation activities.

**Training and competency:**
- Human Factors competence should be addressed across all domains and associated activities
    - for personnel within organizations involved in the European aviation system
    - for EASA and NAA inspection staff
    - for incident and accident investigators and safety analysts
- Establishment of a human factors competency framework for regulators
- Appropriate application of human factors principles in all training activity, including content and delivery.
- Create a European repository for guidelines, best practice, reference material and lessons learnt
- The provision of training material
- The provision of suitable human factors training for regulatory oversight staff for those competent authorities without in-house expertise.

**Regulation and Rule Making**
- High level Generic human factors requirements required across all European regulatory codes
- Supporting AMC material and guidance material needed
- Additional specific requirements and guidance given to sectors where necessary
- Ensuring in-service experience is considered and addressed with the design and certification processes (both initial and continued airworthiness)
- Any information, new material or new product should be reviewed with a human factors critique prior to implementation or publication (action plan to define who, what and when).  This may include the need for an independent human factors evaluation or review.

**EASA and NAA Resources**
- Internal human factors expertise developed
- Human Factors Governance within EASA and other European regulatory organisations
- Role of EHFAG and relationship with EASA and NAAs clearly defined
- Ensuring that regulatory organisations have access to appropriate human factors specialists as well as regulatory oversight staffing having an appropriate level of human factors understanding for oversight and investigations.
- Establish principles concerning the degree of self-regulation and delegation in the Human Factors domain.

**Research and Development**
- Reviewing current safety and human factors initiatives worldwide.
- Consideration of emerging technology and systems that could affect human performance
- Implementation and future human factors research opportunities

**Human Factors Awareness and Promotion**
- Developing a communications plan for human factors promotion
- Management commitment towards safety leadership within regulatory bodies

**Integration of SMS**
- Consideration of  human performance in management decision making

This list will be further revised and expanded as part of the Action Plan development by the EHFAG.

**Acronyms**

| | |
|---|---|
| ACARE | Advisory Council for Aviation, Research, innovation in Europe (http://www.acare4europe.com/) |
| AMC | Acceptable Means of Compliance |
| EASA | European Aviation Safety Agency (http://www.easa.europa.eu/) |
| EASp | European Aviation Safety plan (http://www.easa.europa.eu/sms/) |
| EHFAG | European Human Factors Advisory Group (http://easa.europa.eu/safety-and-research/european-human-factors-advisory-group-EHFAG.php) |
| ESSI | European Strategic Safety Initiative (http://www.easa.europa.eu/essi/) |
| EUROCONTROL | European Organisation for the Safety of Air Navigation (http://www.eurocontrol.int/) |
| FAA | Federal Aviation Administration (http://www.faa.gov/) |
| ICAO | International Civil Aviation Organization (http://www.icao.int/Pages/default.aspx) |
| NAA | National Aviation Authorities |
| NextGen | Next Generation Air Transport System (http://www.faa.gov/nextgen/) |
| SESAR | Single European Sky ATM Research (http://www.sesarju.eu/) |
| SMS | Safety management System |