

SAFETY REGULATION GROUP



HUMAN FACTORS REVIEW

Phase One – Quick Look Report (Second Edition)

Presented by

Jim Reed

HF Review Team Leader

Civil Aviation Authority
Aviation House
Gatwick Airport South
West Sussex
RH6 0YR

*Mobile: +44 (0)7823 326687
Fax: +44 (0)1293 573997
human.factors@caa.co.uk
<http://www.caa.co.uk>*

CONTENTS

	Page
Title Page	
Contents	ii-iii
List of Figures	iv
Abbreviations and Acronyms	v
1.0 INTRODUCTION	1
1.3 Caution!	1
2.0 PURPOSE AND CONTEXT OF PHASE ONE	1
3.0 CONTRIBUTORS	2
3.2 Accountable Managers	2
3.3 Professional Bodies, Groups and Associations	2
3.4 Individuals	3
3.5 CAA	3
4.0 COMMON THEMES	3
4.1.1 Policy	4
4.1.2 Strategy	4
4.1.3 Regulation	4
4.1.4 Governance	4
4.1.5 Assurance	4
4.1.6 Standards	4
4.1.7 Risk	4
4.1.8 Training	5
4.1.9 Design and Manufacture	5
4.1.10 Research	5
4.1.11 Reporting and Analysis	5
4.1.12 Communications	5
4.1.13 Other	5
5.0 KEY MESSAGES	5
6.0 EARLY SUCCESS	6
6.1.1 European Aviation Safety Agency (EASA)	6
6.1.2 UK Human Factors Advisory Board (UKHFAB)(designate)	6
6.1.3 CAA HF Champions	6
6.1.4 Ground Handling Operational Safety Team (GHOST)	7
7.0 NEXT STEPS	7
7.2 Timing	7
7.3 HF Champion Activity	7
7.4 Review Team Activity	7
8.0 SUMMARY	8

Appendix 1	Accountable Manager Feedback Summary
Appendix 2	Professional Bodies, Groups & Associations Feedback Summary
Appendix 3	Individual Feedback Summary
Appendix 4	CAA Feedback Summary
Appendix 5	Consolidated Feedback by Contributors
Appendix 6	Consolidated Feedback by Community
Appendix 7	List of Professional Bodies & Associations

LIST OF FIGURES

FIGURES

- | | |
|----------|---------------------------|
| Figure 1 | Percent Response by Group |
| Figure 2 | key Messages |
| Figure 3 | HF Review Phases |

ABBREVIATIONS AND ACRONYMS

AOC	Air Operator Certificate
CAA	Civil Aviation Authority
EASA	European Aviation Safety Agency
EHFAG	European Human Factors Advisory Group
ESP	Enhancing Safety Performance
FDM	Flight Data Monitoring
FTL	Flight Time Limitation
GHOST	Ground Handling Operational Safety Team
GM	Guidance Material
HF	Human Factors
HSE	Health & Safety Executive
MEDA	Maintenance Error Decision Aid
MOR	Mandatory Occurrence Reporting
NAA	National Aviation Authority
RBO	Risk-based Oversight
SMS	Safety Management System
SR2	Strategic Review of Safety Regulation
SRG	Safety Regulation Group
SSP	State Safety Plan
TEM	Threat Error Management
UKHFAB	United Kingdom Human Factors Advisory Board

17 June 2011

CAA/EC/GSS/HF/945



HUMAN FACTORS REVIEW PHASE ONE – QUICK LOOK REPORT SECOND EDITION

Reference:

A. Document CAA/EC/GSS/HF/933 dated 28 September 2010 (Comprehensive Review of Human Factors in UK Civil Aviation - Terms of Reference).

1.0 INTRODUCTION

1.1 This second edition of the HF Review [the Review] Phase One Quick Look Report has been published in response to early feedback that suggested immediate validation of the Phase One results was both justifiable and necessary in order to avoid mis-perceptions of widely acknowledged good practice (for example, Crew Resource Management within Flight Operations and the MEDA approach to airworthiness occurrence investigation). Indeed, the Review is committed to identifying such good practice and to explore how the demonstrable benefits to aviation safety in one aviation sector could be made relevant and available to other sectors. Notwithstanding the obvious imperative to maintain current levels of safety within UK aviation, all feedback will be considered in detail to ensure that improvements in Human Factors can be made wherever the evidence indicates a need to do so.

1.2 The report opens by restating the purpose of Phase One and confirming its place in the wider context of the Human Factors (HF) Review [the Review]. It constitutes a summary of the common themes evidenced in Review submissions to date.

1.3 **Caution!** While the words used faithfully reflect what respondents to the Review actually said, its contents do not at this stage represent an agreed position. Phases Two (validation and gap analysis) and Three (option generation and strategy drafting) of the Review will test the Phase One findings in expressing arguments for change, before inviting further formal consultation on a first ever UK Strategy for Human Factors in Civil Aviation [the Strategy]. This work will be aligned with the CAA Strategic Plan 2011-2016 and evolving requirements of the State Safety Plan (SSP), Safety Management Systems (SMS), Strategic Review of Safety Regulation (SR2) and wider Civil Aviation Authority (CAA) development projects.

1.4 It also describes the successful early adoption of a number of internal and external initiatives launched concurrently with Phase One.

“The study of human factors is central to the CAA’s safety regulation approach.”

[Source: CAA Strategic Plan 2011 to 2016]

2.0 PURPOSE AND CONTEXT OF PHASE ONE

2.1 Simply put, the purpose of Phase One was to listen. The Review was widely publicised, and four months to 31 January 2011 were set aside in order that all aviation communities, including

CAA front line staff, had the opportunity to submit their ideas, observations, opinions, needs and aspirations. The feedback captured is from some of the most experienced, influential, accomplished and, for others, the most vulnerable in civil aviation. Having been sourced at the coal face, it offers a sound basis for further investigation.

2.2 In context of the wider Review, and notwithstanding the Phase One results, it was recognised that the Review was not starting out with a clean sheet, rather that it would seek to build on the good work that has been done over many years by organisations, teams and individuals, albeit disparate, incoherent and uncoordinated in nature. The overall picture painted by Phase One suggests that there is an appetite to explore and articulate a strategy for HF in civil aviation for the very first time. A strategy that will serve as a consensual, coherent and authoritative point of reference for all those who work within the aviation safety system.

2.3 Further, it was clear from interviews conducted with Safety Regulation Group (SRG) front line staff that the CAA could do more to improve its HF capability in some areas.

2.4 Phase One also saw a great deal of time being invested in fostering a professional network around HF and in nurturing personal relationships of trust and respect that will serve civil aviation well, long after the Review has wound down. This includes those parties that must necessarily be invited to assist in validating the Review findings and recommendations, and their future development, in adopting Better Regulation principles (for example: other National Aviation Authorities (NAA) and other UK Regulatory Bodies).

3.0 CONTRIBUTORS

3.1 Submissions were invited from across the aviation community and were grouped in the first instance by (see Figure 1):

- Accountable Managers
- Professional Bodies, Groups & Associations
- Individuals (including training organisations and consultancy firms)
- CAA

Detailed and consolidated feedback summaries are included at Appendices 1 to 6. The identity of the contributors has been removed.

3.2 Accountable Managers. 260 Accountable Managers received personal letters of invitation to contribute to the Review in November 2010. Of the 15 that responded, all communities were represented. Furthermore, the quality and consistency of their submissions suggest that their testimony faithfully reflects genuine HF concerns.

3.3 Professional Bodies, Groups & Associations. 24 Professional Bodies, Groups & Associations (see Appendix 7) expressed an interest, with 8 making formal submissions. On the surface, this appears a relatively low proportion. However, a number of individuals belong to more than one Professional Body, Group or Association and some also contributed privately. Having considered the possibility of bias and resolved dual accounting, here, too, the quality and degree of correlation between submissions, irrespective of community, lends further significance to the common themes identified, which the Review Team assess to faithfully reflect genuine HF concerns.

3.4 Individuals. This group provided one of the noteworthy events of the Review to date. The Review Team was aware of how an integrated communications campaign could deliver benefits to the early stages of its work, and a redesign of the CAA HF Web pages was undertaken. The website quickly returned 44 individual enquires, of which 20 subsequently made a submission.

Although far from leading edge, it is the intention to continue to develop the website into a useful, interactive forum for the aviation HF community. The Review was announced at several high profile conferences and many personal meetings were held with groups and individuals in promoting the Review.

3.4.1 Here, too, the Review Team assess that the combined individual submissions are significant and representative of genuine HF concerns.

	<i>Invited</i>	<i>Received</i>	<i>%</i>
<i>Accountable Managers</i>	260	15	6
<i>Professional Bodies, Groups & Associations</i>	24	8	33
<i>Individuals</i>	44	20	45
<i>CAA</i>	27	13	48

Figure 1 (percent response by Group).

3.5 CAA. The testimony of those responsible for discharging the regulatory oversight function at the coal face returned the highest percentage participation. The Review Team expresses its gratitude to the Flight Operations and Airworthiness staff that were shadowed during a number of combined Ramp Inspections in 2010, and to other CAA Business Areas for their advice and input throughout Phase One.

3.5.1 All interviews lasted about an hour, and the views expressed were an individual’s observations and opinions of HF maturity from both the company and regulator perspectives. The Review Team was impressed by the commitment and professionalism that CAA staff displayed to those they regulate and of their thought leadership in confronting issues that they themselves believed should be better addressed within the Authority, sometimes leaving them professionally exposed.

3.5.2 Here again, their testimony chimed almost exactly with the external submissions regarding common themes and key messages.

3.6 Although not discussed here further, submissions were also consolidated by community interest. Useful information was extracted to ensure that relevant and appropriate weight and emphasis is given to particular operations and environments in subsequent phases of the Review.

4.0 COMMON THEMES

4.1 The Reference (HF Review Terms and Conditions) considers the aviation safety spectrum¹. However, the language evolving from the development of SMS and a risk-based approach to Enhancing Safety Performance (ESP) indicates that a more appropriate term should be “aviation safety system”. It is important to set the Common Themes in context (see the caution at Sub-Paragraph 1.3). Particular care should be applied to the observations of risk in Sub-paragraph 4.1.7, which may be indicative of varying interpretations of the subject of risk rather than a coherent picture of HF threats to the aviation safety system from specific operations or environments. The common [HF] themes are grouped in a manner that corresponds with the components of the aviation safety system.

¹ Includes, but not limited to, strategy, policy, regulation, governance, training, assurance, standardisation, risk, design & manufacture, research, analysis and communication.

4.1.1 Policy.

- The Review was universally welcomed.
- A single safety philosophy is required, led by CAA.
- Industry wants an integrated business approach.
- SMS must deliver at the coalface.

4.1.2 Strategy.

- HF issues should be given a higher priority.
- Broaden involvement in HF awareness.
- Want an integrated approach across aviation communities.
- The commercial exploitation of people is increasing the safety risk.

4.1.3 Regulation.

- The Regulation is viewed as weak in some areas of HF capability.
- Some elements of non-AOC GA activity need improved oversight.
- Regulation is not effectively challenging the commercially-driven erosion of safety.

4.1.4 Governance.

- Senior Executives need to take ownership of HF.
- Industry and the public must avoid the criminalisation of HF-related accidents.

4.1.5 Assurance.

- Want commonly held performance-based assessment criteria for HF.
- Want HF applied in a way that is proportionate to the risks associated with specific operations/environments.
- CAA frontline oversight of HF could improve in some areas.
- CAA training oversight of HF could improve in some areas.
- Passenger behaviour is part of the safety system.

4.1.6 Standards.

- Want a common language for HF.
- Want a commonly held framework for what really matters in HF.
- Want effective training standards.
- HF instruction is variable.

4.1.7 Risk.

- Inappropriate passenger behaviour.
- Chronic fatigue.
- Chronic stress.
- Automation (particularly in identifying the abnormal).
- Slow onset hypoxia.

4.1.8 Training.

- Training is too tick box.
- Want contextual setting of HF within Threat Error Management (TEM) and SMS.
- Want a commonly held approach to training across aviation communities.
- Want practical application of behavioural HF.
- Need to train for abnormal not just emergency.
- Emphasis required on: Distraction, Decision-making, Workload, Culture, Technical HF, and Command Competence.
- Ab initio pilot training should prepare pilots for a career, not just their next [bonded] contract.
- Raise exam pass mark to improve awareness and standards.
- Educate managers/decision makers together with front line staff.

4.1.9 Design & Manufacture.

- Users want more HF rigor applied.
- Design standards are inconsistent (CS25/CS29).

4.1.10 Research.

- Coordinate to establish better use of resources.
- Seek the evidence.
- Focus on what really matters.

4.1.11 Reporting & Analysis.

- The fidelity of data within the Mandatory Occurrence Reporting (MOR) system needs improving to support HF root cause analysis.
- Want common approach to HF data collection and analysis.
- Normalise data for user benefit.
- Share data better.
- More use of Flight Data Monitoring (FDM) in occurrence investigation.
- More use of specialist advice where it is needed.

4.1.12 Communications.

- CAA should better inform and be better informed in some areas.
- eBusiness and eDocuments should evolve as efficient best practice.

4.1.13 Other.

- The Executive/Frontline divide is real.
- Clash of economics and lifestyle is impacting safety.

5.0 KEY MESSAGES

5.1 In distilling the Common Themes from the Regulator's perspective, a number of messages emerge (see Figure 2). Here again, they should be taken in the HF context, although clear synergies with the aims of SMS and a risk-based approach can be identified or inferred. The key messages are:

- Governance and leadership from the Regulator is welcomed.
- Regulation should be evidenced and targeted to achieve a net benefit to safety.

- Standards are required in some areas, which should be objective and performance-based.
- Training must deliver practical benefit and be cost effective.
- Assurance must be deliberately focussed and improved in maintaining standards in some areas.



Figure 2 (key Messages).

6.0 EARLY SUCCESS

6.1 Before going on to articulate a plan of work for Phases Two and Three, it is worth considering early success with a number of initiatives, which will not only assist with the Review, but will also set a solid foundation upon which the Strategy can take hold and gain momentum from July 2011.

6.1.1 European Aviation Safety Agency (EASA). For some years, an informal European forum has met regularly to offer HF advice to several EASA directorates; EASA having had no coherent focus on HF within its rulemaking process to date. This forum, currently chaired by the CAA and known as the European Human Factors Advisory Group (EHFAG), achieved formal recognition in the first EASA Safety Plan, published late 2010, with responsibility for drafting a European Strategy for HF in Civil Aviation by the end of 2011. The timing of this requirement is entirely coincident with delivery of the UK Strategy, which will be offered to the EHFAG as the basis for a European equivalent. Accordingly, the drafting of the Strategy must consider both culture and complexity in the European context.

6.1.2 UK Human Factors Advisory Board (UKHFAB)(designate). The UKHFAB (designate) is the first high-level governance body for HF in UK civil aviation. At the time of this report, it has met once to explore its proposed Terms of Reference and how best it can make a difference to aviation safety, including the coordination of HF research. Invited members, one from each aviation sector and academia, represent some of the most prominent HF practitioners across industry, with the reach, visibility, credibility and access to their communities to effectively guide and shape the Strategy into the future. It is intended to formalise HF governance arrangements in the Strategy.

6.1.3 CAA HF Champions. In the same way that the UKHFAB (designate) members represent the industry perspective, so a group of specially selected individuals (HF Champions) will act to guide and coordinate internal CAA HF needs. The intention is not to create an HF department or attempt to control regulatory activity, but that the HF Champions work to embed HF principles across all regulatory activities in a coherent manner, naturally, as the first safety consideration. This includes an active HF awareness programme that is expected to commence early 2012. The Review Team considers that it would be imprudent to embark upon such an important and

potentially costly programme until work on the SSP, SMS and other development projects is more mature, and the Champions are properly prepared for the role under a single safety philosophy.

6.1.4 Ground Handling Operational Safety Team (GHOST). As a direct result of Review activity, the CAA Chair of GHOST has established focus group for HF. It is clear that the three-way relationship between an aerodrome operator that issues a permit to a handling agent to work airside, and an airline operator that contracts with the same handling agent for the provision of ground services, continues to be an area of concern in respect of critical safety tasks. This welcome initiative is further enhanced by senior aerodrome and flight operations community representatives sitting together as members of the UKHFAB (designate).

7.0 NEXT STEPS

7.1 Developing relationships, governance and alignment activity will continue and are not discussed further in this report.

7.2 Timing. Effective validation of the Phase One findings must be completed if industry leaders are to continue to support the Review and the future strategy for HF. The Review schedule has been extended to achieve this. The Review Revised Schedule is outlined in Figure 3. The critical dependency is for the document to be available to the EHFAG by the end of 2011.

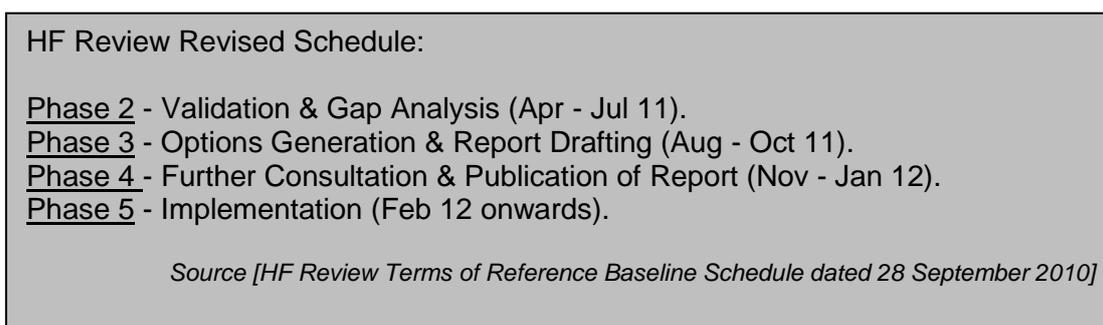


Figure 3 (HF Review Phases).

7.3 HF Champion Activity. The CAA HF Champions will continue to meet regularly to discuss emerging alignment issues (see Paragraph 6.1.3) and to interact with stakeholders as members of the Review Team. The latter will require them to allocate time specifically to meet emerging needs of the Review, but this will be more in a communication and liaison role rather than intrusive interference with daily business area routines, individual workloads or existing lines of accountability. Accordingly, SRG Heads of Business Areas should expect regular updates on the Review from their HF Champions. Real demands on Champions' time (and consequent possible reallocation of responsibilities) will be requested once their role in subsequent phases of the Review has been articulated.

7.3.1 Specific Champion activities during Phases Two and Three will be focussed on assisting with the tasks set out in Sub-Paragraphs 7.4.1 and 7.4.2.

7.4 Review Team Activity. During the remainder of the Review, an appropriate balance must be struck between the complexity and detail of the work undertaken in deriving the content of the Strategy and the resources available, thus time is the major constraint. This dilemma is further compounded by the opportunity to assist EASA described in Paragraph 6.1.1. Accordingly, a prioritised approach will be taken in responding to the Common Themes and Key Messages evidenced in Phase One.

7.4.1 The Review Team must consider, at least:

- A commonly held definition of HF.
- Performance-based maturity of HF within SMS.
- Specific HF safety risks.
- HF training and assurance methods and standards.
- Coherence in HF Guidance Material (GM).

7.4.2 The Review Team may consider, in addition:

- The prevalent human conditions behind 75% of safety occurrences.
- Performance-based HF training standards.
- Performance-based HF assurance assessment criteria.
- Improvements to the MOR scheme.
- HF investigation methods consistent with high fidelity normalised data.

7.5 It is not the purpose of this report to provide solutions, but to indicate the direction of travel for the subsequent Phases of the Review. In particular the Review Team draws the reader's attention to the very deliberate wording used in Paragraph 7.4.1 insofar as *commonly held* does not mean *commonly applied*. On the contrary, it is envisaged that a consensual, authoritative and coherent strategy for HF across the Civil Aviation sector, will afford Senior Executives the flexibility to focus on what really matters in managing HF risk within their own operating environments, and at the same time supporting effective regulatory oversight to insist on proportionate performance standards where specific risks to the aviation safety system are exposed.

8.0 SUMMARY

This quick look report concludes that Phase One of the HF Review has met its purpose, and that a coherent package of work has been identified with which to prepare a UK Strategy for HF in civil aviation.