



ETSC UPDATE:

EU AIR SAFETY POLICY AND RESEARCH

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Introduction

Over the last 10 years the annual average number of deaths in commercial air transport was 1243. The yearly average of deaths in accidents involving EU registered commercial air traffic was 52.

As the European Commission noted recently "All safety experts recognise however that the global rate of accidents is stabilising and, as a consequence, if nothing is done to improve it, the growth in air traffic will lead to an increase in the absolute number of fatal accidents per year."

Against this background there have been a number of developments in air safety policy at EU level.

This edition of ETSC Update summarises Commission plans to improve air safety and also reports on recent findings from Community research programmes.

Proposal for occurrence reporting in civil aviation COM (2000) 847 final

Mandatory reporting

As a complementary measure to Council Directive 94/56/EC on mandatory accident and incident reporting (which ETSC notes is still not fully complied with) the Commission presented a proposal to create a legal framework for mandatory and confidential reporting of incidents, defects or malfunctions. Too few Member States currently have set up such systems.

The aim is to collect and disseminate information on aviation incidents to contribute towards a safer air transport system.

The proposal is based on a feasibility study by the Commission's Joint Research Centre for a European Co-ordination Centre for Aviation Incident Reporting Systems (ECCAIRS). The JRC has developed a tool which provides a means to Member States (who currently have no system) to collect occurrence reports and to exchange data and for data exchange (for those who do without the need to change systems).

Principal provisions:

Member States shall:

- require that reportable occurrences are reported to a competent authority
- encourage voluntary reporting
- designate a competent authority to put in place a mechanism to collect, evaluate, process and store occurrence reports
- the reports shall be stored in a database using software compatible to that developed by the Commission for the purpose of this Directive
- making all available information in that database available to Member States and the Commission
- publish at least annually a safety review containing information on the types of occurrences

ETSC Comment

ETSC welcomes this long awaited Commission proposal for Member

States to be mandatorily required to establish systems for incident reporting. However, whilst it requires the storage of that information in a nominated database and requires information exchange between Member States, it falls short of requiring the establishment of a centralised EU database which limits the utility of this measure for EU policymaking.

Confidential incident reporting

While mandatory reporting has been successful in picking up technical defects, the reporting of human error is less widespread.

In order to tackle the problem of human error on the flight deck (which accounts for the majority of commercial aircraft accidents), information on self-reported errors in serious incidents is required in addition to the independent investigation of aircraft accidents and serious incidents,

Confidential incident reporting systems already exist around the world and demonstrate the utility of acquiring data concerning human error. Very few Member States have taken steps to permit the establishment of such systems.

The aim of the Commission proposal is to provide the necessary framework to enable the establishment of confidential reporting systems throughout the EU. In particular, the Commission proposes that Member States should ensure that all personal details are removed from occurrence reports which are not subject to mandatory reporting.

The Commission also suggests that the current air safety budget could be used to support initiatives.

ETSC Comment:

The types of incident which need to be reported mandatorily and which types voluntarily is unclear in this proposal and needs urgent clarification.

While the proposal requires Member States to adapt their legislation in order to enable the setting up of confidential reporting systems, it falls short of

establishing the EU framework which has been long recommended by safety experts (See: Confidential Incident Reporting and Passenger Safety in Aviation, ETSC May 1996).

The European Parliament is currently considering this proposal. ETSC notes that its previous stand has been to support the establishment of a European confidential system of voluntary reporting and a European database on air accidents, incidents and safety recommendations, co-ordinating the national databases.

A Single European Sky – Report of the High Level Group (Nov 2000)

Under the Chairmanship of EU Transport Commissioner Vice President de Palacio, the High Level Group of senior Member States' representatives has underlined the need for further and stronger European air safety regulation.

Noting that ATM has the primary function to ensure safety, the Group concludes that rising traffic volumes, advanced automation and increasing technological integration between ground and airborne systems will create new challenges for safety managers. Immediate steps needed to be taken to ensure a consistent and robust approach to the preservation and improvement of safety levels.

In particular they emphasised:

- the need for an effective and independent safety regulator at the European level. Safety requirements needed to be mandatory across the EU. While the first step for the proposed European Air Safety Agency would be certification, it might be possible by 2005 to transfer ATM responsibilities to this organisation.
- the need for a distinction to be made between the public role of safety regulators and the service provider who is responsible for safety management.
- the development of a safety action programme specifically dedicated to systems capacity developments
- a non-punitive safety reporting environment in order to assess

compliance with an objective safety target approach

- progressive implementation of controller assistance tools that provide 'safety back-up' in the event of system failure or error (so-called 'safety net' tools)
- support to national safety authorities for the implementation of safety regulation measures.

Single European Sky, Report of the High Level Group DG Energy and Transport, European Commission, November 2000, Brussels

European Air Safety Agency

The Council adopted a decision in July 1998 authorising the Commission to complete the negotiation for the establishment of a new international organisation on air safety. This was in response to widespread recognition that effective regulation in air safety and environmental protection were needed to deliver a high level of protection for the citizen and to provide a level playing field for Community air operators.

In March 2000, the Commission published a working document setting out its proposal for the creation of a Community agency and in December forwarded its proposal for a Regulation to the Council.

The Regulation, repealing Council Regulation 3922/91, provides for the establishment of a Community body – the European Aviation Safety Agency (EASA).

The EASA would be independent in relation to technical matters and have legal, administrative and financial autonomy to carry out various tasks currently performed at Community or national level. The Agency's budget would be derived from a contribution from the Community and from fees paid by the users of the system. Auditing should be undertaken by the Court of Auditors.

EASA – Principal objective

- To establish a high uniform level of aviation safety in Europe

Additional objectives are:

- To facilitate the free movement of goods, persons and services
- To promote cost-efficiency in the regulatory and certification process
- To ensure a common interpretation of the provisions and Annexes
- To promote Community views of aviation safety standards and rule throughout the world

EASA Role

- Assist the Commission in the preparation of legislation and Member States and industry in its implementation
- Issue non-binding means of compliance and guidance material
- Issue type certificates for all aeronautical products
- Assist the Commission in monitoring the application of the Regulation
- Conduct research activities
- Assist the Commission and Member States in the field of international relations, including the harmonisation of rules, mutual recognition of approvals and technical co-operation
- Establish relations with the aeronautical authorities of third countries and international organisations
- In accordance with the principles of subsidiarity and proportionality, take the minimum common action to meet objectives
- Publish an annual safety review

EASA Composition

- A wide involvement of European countries (not just EU members) that have concluded agreements to adopt the Community access in this field would be pursued
- One representative from every Member State, the Commission and the European Parliament would be represented within the Administrative Board for a duration of 5 years (renewable)
- Decisions would be taken by the Administrative Board by a two thirds majority vote

- The Administrative Board would be entrusted with establishing the budget and verifying its execution, adopting financial rules, establishing transparent working procedures for Agency decision-making, and appointing the Executive Director

Role of the Executive Director

- Should make decisions on all safety-related matters.
- To be given a high degree of flexibility as to how to seek advice and to organise the internal functioning of the Agency.
- Member States to be involved in decision-making where rules are to be implemented by national authorities.

Agency staff

- Shall consist of a strictly limited number of officials assigned or seconded by the Commission or Member States to carry out management duties.
- The remaining staff shall consist of other employees recruited by the Agency for a period strictly limited to its requirements.

The working language of the Agency will be English and no decision has yet been reached concerning its location.

Issues raised in the European Parliament

- **Extension of scope of regulation**
The proposal is currently before the European Parliament and the Council of Ministers. The Parliamentary rapporteur Ingo Schmitt (PPE) wants EASA by the end of 2002 at the latest to regulate beyond design, production and maintenance issues to include air traffic management and aircraft personnel activity.
- **Setting up of an independent EU air safety board**
For the purpose of investigating the causes and circumstances of accidents, the draft Parliamentary opinion invites the Commission to

submit as soon as possible a proposal concerning the setting up of an independent body with the task of issuing recommendations to prevent aircraft accidents.

- **Limiting opportunities for exemption**
Parliament also wants to see any exemptions granted by Member States to requirements only in situations where the level of safety is not adversely affected.
- **Parliamentary representation on EASA**
The Parliamentary discussion also revealed unease amongst some MEPs about Parliament being represented on the EASA. If Parliament was to monitor Commission performance, it should do so independently of the Agency, otherwise there might be a conflict of interest and deficit in democratic accountability.
- **Publication of research results**
The results of research funded by the Agency shall be published if not classified as confidential.

ETSC comment:

ETSC welcomes the establishment of an EASA. In a recent report on independent transport accident investigation in the EU, ETSC stressed the need to separate safety performance monitoring from the regulatory function. On establishing a European Air Safety Agency, there was also a need to establish an organisation independent of this regulator to:

1. initiate and maintain a European database of accident and incident statistics as well as more general statistics for the accurate calculation of exposure data
2. initiate and maintain an EU system for monitoring the implementation and the effects of any safety recommendations
3. initiate safety performance indicators

4. initiate a database on injury causation
5. encourage further co-operation between the EU air accident investigation bodies.

Proposal for a Regulation of the European Parliament and of the Council on establishing common rules in the field of civil aviation and creating a European Aviation Safety Agency COM/2000/0595 final.

Flight Time Limitations

Last March the Commission presented a proposal for a Council and European Parliament Regulation amending Regulation 3922/91 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation (COM (2000) 121). The objective of the proposal was to transpose several technical Joint Aviation Requirements into Community law.

In considering this proposal the European Parliament pressed, in particular, the need for a Community regulation on flight time limitations to address the problem of fatigue. Regulations on duty time for flight crews differ very much between countries and any EU requirement needs to be based primarily on safety needs.

The Resolution approved the Commission proposal as amended, but called on the Commission, should the representatives of the Airlines and the Employees reach agreement on flight and duty time limitations and rest requirements for flight crew and cabin crew, by 1 May 2001, to make a proposal on the basis of that agreement to modify this Regulation.

The Resolution also called on the Commission, should the representatives of the Airlines and the Employees be unable to reach an agreement on flight and duty time limitations and rest requirements by 1 May 2001, to come forward with a proposal setting out the flight and duty time limitation and rest requirements for flight crew and cabin crew, by 1 July 2001.

This deadline has recently been extended by the European Parliament to 1st October 2001.

Community research in air safety

Information on recent projects

ABEAM: *Across Border Effects of Air Traffic Management*

AIMS: To assess interface effects for the future EATMS (European Air Traffic Management System) implementation area and to identify possible technical and operational solutions to any problem discovered; to make recommendations on how to mitigate interface effects at the borders of the ECAC (European Civil Aviation Conference) area when applying the Target Operational Concept of EATMS; to identify problems related to the traffic exchange between ICAO/EUR (International Civil Aviation Organisation/Europe) and adjacent regions; to address the verification of the consistency, between EATMS concepts and ICAO regional plans.

RESULTS: ABEAM has produced:

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- A set of region-specific recommendations on how to mitigate discovered interface effects. The regions covered were NAT (North Atlantic), AFI (African and Indian Ocean), MID (Middle East) and for Europe the non-ECAC countries.
- General recommendations on how to involve non-ECAC States in further development and implementation processes, e.g. by: holding meetings for knowledge exchange and staff training; by co-operation in the planning of common route structures; by common selection of navigation aids; by promoting civil/military agreements on the co-ordinated use of air space; by general attempts to improve information management.
- Proposals on how to improve collaboration in decision making and IFPS (Initial Flight Plan Processing System) issues.

ARIBA: *Balancing actors' responsibility to achieve ATM system safety*

AIMS: Assess certification issues for ground ATM systems and operational procedures and to produce a certification framework for all actors. The focus is on space-based navigation and surveillance, advanced ATC automation support tools and flight plan exchange through air ground data exchange.

Results: Five in-depth studies and consolidation of results to produce a certification framework in ATM that allows for effective safety management in the implementation phase for all those responsible:

Part 1: an improved ATM safety certification framework applicable for various commercial actors in ATM, identifying how authorities could support best practice approaches by enforcement of formal survey and approval

Part 2: outlining in guidelines the safety validation of changes to systems or ATM operations by developing risk criteria, dependability techniques for assessing technical sub-systems; task load analysis for pilots and controllers; fast-time simulation to assess air traffic network characteristics, hazard identification and classification techniques, accident risk assessment techniques, feedback to advanced operation and techniques to identify pro-active and reactive safety improvements of operation and service.

Part 3 outlining in guidelines the safety validation of automated ATM systems by component manufacturers

These results are expected to feed into the development of safety-related ATM standards and in particular a safety-forecasting model.

CONTAM-RUNWAY: *Take-off and landing on runways contaminated by standing water, slush or snow.*

AIMS: Review the validity of existing requirements for runway operation in such conditions for small and commuter aircraft.

EURICE: *European research on aircraft ice certification*

AIMS: Examine current aircraft and rotorcraft icing problems and the related certification process, operational requirements and flight standards. This should feed into a revision of the current regulation. Produce a European database on theoretical investigations and flight tests for icing effects. Further recommendations to improve onboard icing protection systems and corresponding regulations.

ECOTTRIS: *European collaboration on transition training for improved safety*

AIMS: produce an accident and incident analysis in relation to transition training factors; derive operational and/or training factors which lead to possible safety risks as well as skill and training analysis and

derive requirements and recommendations for transition training; recommend cockpit hardware changes where improved procedures and/or training cannot solve the specific problem.

RESULTS: ECOTTRIS has produced:

- a comprehensive analysis of flight deck design philosophies employed by various aircraft manufacturers, focusing on automated flying functions, e.g. steering, navigation, system management, communication and lookout;
- an accident and incident review, identifying factors related to automation/glass cockpits and poor transition training of crews;
- an in-depth investigation of glass cockpit skills, identifying seven different skill-groups relating to three principal types of individual behaviour, i.e. knowledge-based, rule-based and skill-based behaviour. This investigation was performed by distributing a targeted questionnaire to glass cockpit pilots in Europe. The most important skill-groups found in the evaluation related to, knowledge of automation and decision-making;
- an assessment of current training and transition activities at prominent airlines (British Airways, Lufthansa) and the aircraft manufacturer Airbus;
- recommendations for a Crew Resource Management (CRM) for glass cockpits booklet, containing a set of real-life incident scenarios, highlighting the need for proper CRM in glass cockpit environments;
- an assessment of computer-based simulation software, by performing tests with sample pilots from British Airways and an evaluation feedback by means of a questionnaire;
- a set of specific recommendations concerning training content, training methods and the associated training media.

The transition from conventional aircraft cockpits to state-of-the-art glass cockpits will have to take into account human factors, which have not been properly addressed in training schemes so far.

The project's results, particularly the detailed set of recommendations for pilot training and performance, are expected to be used to enhance future transition training initiatives for glass cockpit pilots

ICEPS: *Injury criteria for enhanced passive safety in aircraft*

AIMS: In view of the obvious gaps in existing standards and regulations, develop new assessment criteria for enhanced

passive safety in aircraft based on accident analysis and experience in the car sector.

GORAC: GCAS operational requirements and certification

AIMS: develop requirements for a new generation of Ground Collision Avoidance Systems (GCAS) in terms of certification (airworthiness) and operational issues.

RESULTS: GORAC has produced:

- specifications for possible GCAS simulation facilities and identification of five suitable simulators in France, Germany and the Netherlands that apply both to validation requirements and the necessary implementation verification
- a survey of applicable existing specifications and regulations, in particular following European Joint Airworthiness Requirements (JAR), and the determination of regulatory gaps linked to GCAS features
- proposals for validation methods, seeking compliance with certification requirements, for the three main areas of data base integrity, dynamic algorithms and HMIs, which address the interaction between cockpit crews and GCAS visual and aural outputs
- guidelines for GCAS data base certification, specified for Terrain Elevation Data Bases, Obstacle Data Bases and Airport Runway Data Bases
- a preliminary regulation document for the "Preparation of the Certification Requirements" which describes the certification methodology for GCAS and proposes corresponding Means of Compliance.

IMPCHRESS: Development of European specifications for improved infant and child restraint devices in air transport

AIMS: develop an objective method for evaluating the performance of child restraint devices in aircraft; demonstrate that this can be met by modifying existing automotive child restraint devices; investigate how a number of automotive child restraint technologies can be implemented in aircraft.

JAR TEL: Joint Aviation Regulations-translation and elaboration of legislation

AIMS: Improve human factors related requirements laid down in JAA regulations. This could be done by a proposal for harmonised application of rules laid down in an Acceptable Means of Compliance (AMC).

RHEA: Role of the Human in the Evolution of ATM Systems

RESULTS: RHEA has produced:

- a review of 20 ATM studies, relevant in the project context, accompanied by a literature survey to identify information sources about automation in ATM, leading to a list of 14 key references
- an overview of conclusions from literature surveys to be used by a wider audience, such as the operational success of Human Machine Interface (HMI) enhancements and machine aided evaluation, the current testing of co-operative tools and dynamic allocation, and the finding that complete automation happens to fail before complete simulation does
- an evaluation of 7 selected automation concepts that address the man/machine interface in Air Traffic Control (ATC): controller as supervisor, machine proposal strategy, machine-aided evaluation, dynamic allocation with human delegation, dynamic allocation with machine delegation, dynamic aircraft delegation and cognitive (assistance) tools, which have been found most promising for several ATC environments
- requirements on automation of ATM reflecting on the two main dimensions automation related issues, and basic controller functions.

For further information, see European Commission:

http://europa.eu.int/comm/transport/extra/thematic_papers.html

5th Framework research programme

The Commission announced its call in June for new research project proposals to be submitted by September. There are two air transport research tasks which impinge on safety:

1. Observatory of the performance of the European airport system. Assessment of the impact of air traffic in airports.

While safety is not mentioned explicitly in the task, third party risk, and the development of safety

performance indicators are clearly key issues

2. Methodology to collate flight operational and human factors data to improve safety trend analysis within the air transport system

The objective is to develop new methodologies and models to attempt to correlate aircraft/operational data and human factors data, and develop corresponding analysis methods to identify causal factors which lead to accidents and incidents.

<http://www.cordis.lu/growth>

6th Framework research programme

Aircraft safety research in the context of the substantial rise in traffic is a key safety (and only!) action in the Commission's proposal for the next Community Research programme.

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