



WORKING PAPER

**DIRECTORS GENERAL OF CIVIL AVIATION CONFERENCE
ON A GLOBAL STRATEGY FOR AVIATION SAFETY**

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Theme 1: The status of aviation safety today

Topic 1.3: Initiatives by States and industry

**COMMERCIAL AVIATION SAFETY TEAM — WORKING TOGETHER
FOR AVIATION SAFETY**

(Presented by the United States)

SUMMARY

The Federal Aviation Administration (FAA), in partnership with the aviation community, has established a focused agenda to make the skies even safer. Using a disciplined, data-driven approach, the commercial aviation safety team (CAST) has analyzed past accident and incident data and adopted targeted interventions to reduce accidents in the top safety focus areas of controlled flight into terrain, approach and landing, loss of control, runway incursion, turbulence and uncontained engine failures. The ultimate goal is to reduce the rate of commercial fatal accidents in the United States by 80 per cent by 2007, to support improvements in global accident rates and to continuously improve commercial aviation safety beyond 2007. In addition to the work that has been completed to reduce the historically recurring causes of accidents and loss of life, CAST has recently redirected its voluntary safety efforts to the diagnostic and prognostic study of future safety threats and the identification and mitigation of accident precursors before accidents occur. This paper recommends that ICAO: 1) institutionalize actions that have been proven to enhance safety; and 2) serve as a catalyst for the sharing of safety data in a non-punitive, multinational environment.

Action by the Conference is in paragraph 4.

1. INTRODUCTION

1.1 The United States airline industry accident rate of 0.4 fatal accidents per million departures is already among the lowest in the world. That rate is much lower than the overall worldwide

commercial aviation fatal accident rate of 0.73 fatal accidents per million departures. Nevertheless, no State may assume that accident rates will remain low given the projected growth in air travel.

1.2 The commercial aviation safety team (CAST), a United States government-aviation industry partnership, has developed an integrated, data driven strategy to reduce the commercial aviation fatality risk in the United States. By implementing the forty-seven most promising safety enhancements, the experts believe they can reduce fatality risk of commercial air travel in the United States by seventy-three per cent by 2007. Thirty safety enhancements have been completed and seventeen others are underway.

1.3 Although most participants are from the United States, CAST promotes new government/industry safety initiatives throughout the world. With that in mind, CAST coordinates with the International Civil Aviation Organization (ICAO), Flight Safety Foundation (FSF), International Air Transport Association (IATA), European Joint Aviation Authorities (JAA), Transport Canada Civil Aviation (TCCA) and other organizations. CAST has established links to other safety initiatives, such as the European Joint Safety Strategy Initiative (JSSI), Pan American Aviation Safety Team (PAAST), ICAO cooperative development of operational safety and continuing airworthiness programme (COSCAP) initiatives, and other regional safety programmes.

1.4 More could be done to make the CAST efforts truly global and to prepare for the next phase of looking at precursors to accidents and incidents.

2. DISCUSSION

2.1 A reduction in the worldwide accident rate is a long-term goal of CAST. To accomplish this, other States must adopt enhancements that have proven to be successful. ICAO regional organizations such as COSCAPs, and regional safety oversight organizations (RSOs) have already adopted key CAST recommendations such as requiring ground proximity warning systems. ICAO panels should consider how other key accomplishments of CAST could be incorporated into ICAO guidance.

2.2 CAST enhancements were developed based on the study of the most common categories of aviation accidents, e.g., controlled flight into terrain, approach and landing, loss of control, weather (turbulence), runway incursion and uncontained engine failure. In addition, icing, maintenance, mid-air collisions and cargo-related accidents have been studied and safety enhancements will be finalized in early 2006.

2.3 CAST has supported the development of many tools that can easily be used by both operators and States. For examples of CAST outputs, see the reference materials listed below. For example, the Airline Pilots Association “Online Runway Safety Education Course” (http://flash.aopa.org/asf/runway_safety_alpa/) has developed an internet-based interactive programme to increase situational awareness in the airport environment and help reduce chances of a runway incursion. (Other training can be accessed from the Flight Safety Foundation.)

2.4 CAST has proven that data is the key to success. For each focus area, CAST uses a disciplined, data driven, focused approach to analyze past accidents and incidents, to identify accident precursors. Specific safety enhancements are developed to address these precursors and contributing factors. The safety enhancements are implemented and the implementation is tracked for effectiveness. The knowledge gained is used to continually improve the aviation system.

2.5 CAST has recently redirected its efforts to diagnostic and prognostic study. Support for this initiative will require the establishment of a safety information analysis system that is significantly more extensive and sophisticated than the basic system necessary to acquire implementation and effectiveness metrics for the historically-derived existing enhancements or monitor known problems identified by CAST.

2.6 The establishment of an aviation safety information analysis and sharing (ASIAS) infrastructure that enables the free sharing of de-identified, aggregate safety information is the essential element of future safety efforts. The CAST ASIAS programme picks up where the historical accident case study effort leaves off, by combining databases from many sources in a protected, aggregated manner and using improved analytical techniques to enable early identification of exceedances, atypicalities or aberrations that can be further studied to determine their future safety significance and need for mitigation.

2.7 Improved data and analysis techniques are key considerations for all of the critical safety areas that have been identified. This information system must provide access to numerous databases, maintain their currency, enable interoperability across their different formats, provide the ability to identify future threats, conduct a causal analysis of those threats, and recommend solutions. As an aviation community, we need to look at data in new ways that allow flight crew members, operators, manufacturers, and the regulatory authorities to focus on breaking causal chains and taking action before an identified chain of events leads to an accident.

2.8 There are three basic purposes for such a system – evaluating the effectiveness of the current safety interventions, monitoring known problems and risks, and identifying future risks. All of these purposes could be met by a single system that provides access to the necessary databases while maintaining the anonymity of owner-sensitive data.

2.9 ICAO has the opportunity to be a key stimulant to data sharing, by creating an integrated, barrier-free, architecture for sharing critical aviation safety data. The future success of safety information analysis and sharing of results can only be achieved when de-identified, aggregated data is freely shared amongst all aviation community members and protected from inappropriate use. CAST believes to foster this future safety vision will require the collaborative support of all ICAO Contracting States to remove the barriers and obstacles to data sharing and to instil a safety management system (SMS), with supporting culture, that allows data-driven decision making and prevention of future accidents.

3. CONCLUSION

3.1 CAST will continually monitor our performance-based data to track our work to address the causal factors of accidents as well as to identify any emerging causal factors that need to be addressed in the future.

3.2 The future of aviation safety, to both ensure the solutions to the repetitive historical causes of accidents and loss of life are effectively implemented and most importantly to identify and mitigate future threats prior to accidents occurring, is dependent on safety information analysis and sharing of results.

3.3 The critical ingredient to future safety gains is a worldwide aviation safety information analysis and sharing system. Toward this end, we challenge all the ICAO Contracting States to support and institutionalize the ASIAS programme.

4. **ACTION BY THE CONFERENCE**

4.1 The Conference is invited to:

- a) Urge the ICAO Contracting States to continue reviewing, evaluating, and implementing appropriate CAST safety enhancements
- b) Urge the ICAO Council to continue incorporating appropriate CAST safety enhancements into Standards and Recommended Practices (SARPs), and associated guidance material.
- c) Urge the ICAO Council and ICAO Contracting States to remove legal barriers and establish protections for the de-identification and sharing of information on aircraft operations and incidents
- d) Urge the ICAO Council and ICAO Contracting States to promote the establishment of systems (infrastructure, tools and resources) to aggregate various safety information databases to provide the automation infrastructure, database archiving and analytical automated tools to search and establish both a baseline and trending capability of specific safety metrics.

REFERENCE MATERIALS FROM CAST

FAA Publications:

Standard Operating Procedures for Flight Deck Crew Members (AC 120-71).

Crew Resource Management Training (AC 120-51).

Operator's Aviation Safety Handbook, SAE-G18 committee document, and the FAA Audit Tool.
Handbook Bulletin Air Transportation – 14 CFR Part 121 and 135 air carrier safety departments, programs, and safety directors (HBAT 99-19).

Handbook Bulletin Air Transportation – Policy Company Operating Manuals and Company Training Program Revisions for Compliance with Current Airplane or Rotorcraft Flight Manual Revisions (HBAT 99-07)

Handbook Bulletin for Air Transportation – Airplane Flight Manual Revisions and Aircraft Manufacturers Operations Bulletins (HBAT 99-16)

Flight Standards Information Bulletin for Airworthiness – Cold Weather Servicing of Aircraft Nose Landing Gear Struts (FSAW 97-10)

Handbook Bulletin for Airworthiness – Air Carrier Operations Specifications to Make Arrangements with Other Organizations to Perform Substantial Maintenance and Aircraft and Maintenance Provider Contracts (HBAW 96-05C and 98-01)

Joint Handbook Bulletins for Air Transportation and Airworthiness (HBAT 98-18 and HBAW 98-09)

Part 91 Pilot and Flight Crew Procedures during Taxi Operations and Part 135 Single-Pilot Operations (AC 91-73)

FAA CD (*FAA Taxi 101*). Guidance for mechanics and others who tow or move aircraft within airport movement areas

FAA CD *Commercial Aviation Safety Team (CAST)*. Includes Risk Assessment Tool, reference materials, team reports and listing of safety enhancements.

Training:

Flight Safety Foundation (http://www.flightsafety.org/technical_initiatives.html) has conducted research and training in the following areas, as contained in the ALAR Tool Kit CD:

- Controlled Flight Into Terrain
- Continuing Airworthiness Risk Evaluation
- Flight Operations Risk Assessment System
- Flight Operational Quality Assurance
- Ground Accident Prevention
- Operators Guide to Human Factors in Aviation