

**Turbulence
Joint Safety Implementation Team

Research Detailed Implementation Plan
For
Cabin Injury Reduction During Turbulence**

DRAFT

Statement of Work: Reduce turbulence injuries to flight attendants and passengers through improved situational awareness, turbulence encounter management procedures (before, during and after encounter), enhanced communication and identification of effective cabin design safety features.

This project encompasses six safety enhancements, three of which are R&D and three of which are immediately implementable (as detailed in the Cabin Injury Reduction Detailed Implementation Plan). All six safety enhancements employ changes in procedures or equipment based upon industry best practices and documented in an Advisory Circular (AC).

Lead Organization for Overall Project Coordination (LOOPC): ATA Cabin Safety Committee/Flight Operations Committee

SAFETY ENHANCEMENT 79 (Research): Improved Seat Belt Usage

Score (InjryRdx%): 2007: 0.10 2020: 0.10 Full: 0.10 '07 Imp: 100%

Total Resources Required:

	Government		Manufacturers		Operators		Total
	FTE	\$M	FTE	\$M	FTE	\$M	FTE/\$M
2007	2.1	0.42					2.1/\$0.42M
2020							--/--
Totals	2.1	0.42					2.1/\$0.42M

Completion Date: Completed 26 months after CAST approval of Safety Enhancement.

Output 1: Research Human Factors best practices for improving passenger seat belt use.

Resources: NASA (LOOC), airline representatives from airline flight attendant training and safety and flight operations.

Timeline: Completed 26 months years from CAST approval of Safety Enhancement.

Actions:

- **Airlines** – With NASA Ames, develop human factors survey
- **NASA Ames** -- Complete research for human factors best practices for increasing passenger use of seatbelts.
- **NASA/Airlines** – Collaborate on a demonstration of results and develop recommendations to improve passenger seat belt usage.

Output 2: Evaluate research findings and make appropriate recommendation for implementation to CAST.

Resources: FAA/AFS-200 (Cabin Safety) (LOOC), FAA (CAMI), NASA-Ames, ATA (Flight Safety Committee, Training Committee, Safety Council, Operations Council), and other experts as necessary.

Timeline: Completed 30 months after CAST approval of Safety Enhancement.

Actions:

- **FAA/AFS-200, Cabin Safety:** Evaluate research findings and develop implementation plan.
- **FAA/AFS-200, Cabin Safety:** Present recommendation, as appropriate, to CAST for implementation.

Performance Goals & Indicators for Safety Enhancement/Outputs:

- **Goal:** Complete research to show what measures will produce optimum seat-belt usage.
- **Indicator:** Acceptance of research report and implementation recommendation by CAST.

SAFETY ENHANCEMENT 80 (Research): Aircraft-wide Communications

Score (InjryRdx%): 2007: 0.0 2020: 0.16 Full: 0.16 '07 Imp: 0%

Total Resources Required:

	Government		Manufacturers		Operators		Total
	FTE	\$M	FTE	\$M	FTE	\$M	FTE/\$M
2007							/\$0.0
2020	1.25	0.25				0.10	1.25/\$0.35M
Totals	1.25	0.25				0.10	1.25/\$0.35M

Completion Date: Completed 12 months after CAST approval of Safety Enhancement.

Output 1: Identify and evaluate current technology for instant aircraft-wide communications systems and make appropriate recommendations for implementation to CAST.

Resources: ATA Cabin Operations Committee/Flight Safety Committee (LOOC), NASA , FAA-HF (CAMI), FAA/AFS-200, Cabin Safety, Airlines (Directors of Operations and Safety), Flight Attendant Unions, Pilot Unions, TSA

Timeline: Completed 12 months after CAST approval of Safety Enhancement.

Actions:

- **ATA/Airlines/FA Unions/Pilot Unions** -- Develop a concept of operations (ConOps) for “instant aircraft-wide communications”
- **NASA/FAA-CAMI** -- Working with TSA, identify low cost alternatives from existing technology for instant aircraft-wide communications
- **ATA/Airlines** -- Present findings and implementation recommendation, if any, to CAST.

Performance Goals & Indicators for Safety Enhancement/Outputs:

- **Goal:** Complete research to show what systems will yield cost/effective aircraft-wide communications.
- **Indicator:** Acceptance of research report and implementation recommendation by CAST.

SAFETY ENHANCEMENT 83 (Research): Cabin Design – Aircraft Equipment Other than Handholds – New Production & Retrofit

Score (InjryRdx%): 2007: 0.03 2020: 0.14 Full: 0.14 '07 Imp: 20%

Total Resources Required:

	Government		Manufacturers		Operators		Total
	FTE	\$M	FTE	\$M	FTE	\$M	FTE/\$M
2007	0.5	0.10				0.16	0.5/\$0.26M
2020							--/--
Totals	0.5	0.10				0.16	0.5/\$0.26M

Completion Date: 12 months after CAST approval of Safety Enhancement

Output 1: Identify and evaluate turbulence-friendly cabin interior products (current technology), other than handholds for possible installation in new production and retrofit in legacy aircraft.

Resources: ATA, Cabin Safety/Committee (LOOC), airlines (designated engineering representative), aircraft cabin vendors, aircraft manufacturers, and flight attendant unions, FAA/AFS-200 (Cabin Safety), FAA/AIR, and FAA/CAMI.

Timeline: Completed 12 months after CAST approval of Safety Enhancement.

Actions:

- **ATA/Airlines/FA Unions/Manufacturers/FAA-CAMI --** Identify and evaluate current aircraft cabin interior products that will provide optimized protection of occupants during all levels of turbulence for use in new production and retrofit aircraft.

Output 2: Determine implementation feasibility and cost/effectiveness of candidate systems and make implementation recommendation to CAST.

Resources: ATA, Cabin Safety Committee (LOOC), airlines (designated engineering representative), aircraft cabin vendors, aircraft manufacturers, and flight attendant unions, FAA/AFS-200 (Cabin Safety), FAA/AIR, and FAA/CAMI.

Timeline: Completed 24 months after CAST approval of this Safety Enhancement.

Actions:

- **ATA/Airlines/FAA:** Determine implementation feasibility and cost/effectiveness of candidate systems.
- **ATA/Airlines/FAA:** Make a recommendation for implementation to CAST

Programmatic approach:

Organizational strategy

The Turbulence JSIT identified the ATA Cabin Safety Committee as the project lead for Cabin Injury Reduction During Turbulence. The project lead will coordinate and assist with the implementation of the activities outlined in this Implementation Plan and will, when requested, provide progress reports to the CAST. Implementation of this project is viewed as a shared responsibility and tasks will be divided between FAA and organizations/persons in industry. The Lead Organization for Overall Project Coordination (LOOPC) is the ATA Cabin Safety Committee. The Lead Organization for Output Coordination (LOOC) is FAA/AFS-200, Cabin Safety. The roles and

responsibilities of the LOOPC and LOOC are described in the CAST approved JSIT Process Document.

Implementation Activities

Data has consistently shown that most turbulence related injuries occur to FAs and passengers who are not properly secured. Over the years government and industry efforts have addressed this issue in an attempt to reduce turbulence injuries to FAs and passengers. These efforts have lacked over all coordination and consequently have not been effective as indicated by the increasing trends in FA injuries. Central to the organizational strategy will be the integration of these various efforts combined with current data to develop comprehensive guidance. The Lead Organization in Output 1 and 2, working through the Principal Operation Inspectors, will initiate a process to determine existing best practices to be considered in the development of future guidance. Human factors research will further enhance the guidance for FA security and passenger seatbelt compliance.

Key Products and Milestones

<u>Safety Enhancement 79: Improved Seat Belt Usage (Research)</u>		
<u>Output 1:</u> Research Human Factors best practices for improving passenger seat belt use.		
Action	Responsible Party	Completion Date
Develop Human Factors survey.	NASA/Airlines	12 months from CAST approval.
Complete research for human factors best practices for increasing passenger use of seat belts.	NASA	24 months from CAST approval.
Collaborate on a demonstration of results and develop recommendations to improve passenger seat belt usage.	NASA/Airlines	26 months from CAST approval.
<u>Output 2:</u> Evaluate research findings and make appropriate recommendation for implementation.		
Action	Responsible Party	Completion Date
Evaluate research findings and develop implementation plan.	FAA/AFS-200	28 months from CAST approval.
Present recommendations, as appropriate to CAST for implementation.	FAA/AFS-200	30 months from CAST approval.

<u>Safety Enhancement 80: Aircraft-wide Communications (Research).</u>		
Output 1: Identify and evaluate current technology for instant aircraft-wide communications systems and make appropriate recommendations for implementation to CAST.		
Action	Responsible Party	Completion Date
Develop a concept of operations (ConOps) for “instant aircraft-wide communications”.	ATA/Airlines/ FA Unions/Pilot Unions	2 months from CAST Approval.
Working with TSA, identify low cost alternatives from existing technology for instant aircraft-wide communications.	NASA/FAA- CAMI	8 months from CAST approval.
Present findings and implementation recommendations to CAST	ATA/Airlines	12 months from CAST approval.

<u>Safety Enhancement 83: Cabin Design – Aircraft Equipment other than Handholds – New production and Retrofit. (Research)</u>		
Output 1: Identify and evaluate turbulence-friendly cabin interior products (current technology) other than handholds, for possible installation in new production and retrofit in legacy aircraft.		
Action	Responsible Party	Completion Date
Identify and evaluate current aircraft cabin interior products that will provide optimized protection of occupants during all levels of turbulence for use in new production and retrofit aircraft .	ATA/Airlines/ FA Unions/ Manufacturers/ FAA-CAMI	12 months from CAST Approval.
Output 2: Determine implementation feasibility and cost effectiveness of candidate systems and make implementation recommendations to CAST.		
Action	Responsible Party	Completion Date
Determine implementation feasibility and cost effectiveness of candidate systems..	ATA/Airlines/ FAA	22 months from CAST approval.
Make implementation recommendations to CAST.	ATA/Airlines/ FAA	24 months from CAST approval.

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Risk Description and Risk Mitigation Plan:

RISK DESCRIPTION	RISK MITIGATION PLAN
R1 – Changing corporate culture will be difficult and ATA may not be able to insure full compliance with the standards developed.	M1 – Insure corporate buy-in of plan.
R6 – Government does not maintain monetary support of turbulence effort within responsible Government organization.	M6 – CAST and industry assist the responsible Government agency by advocating funding and prioritization for continued turbulence funding. Industry provides guidance for needs and priorities to support aviation safety.
R7 - Responsible Government organization priority shifts away from turbulence.	M7 - CAST and industry assist the responsible Government organization by advocating funding and prioritization for continued turbulence funding. Industry provides guidance for needs and priorities to support aviation safety.
R10 – Unfavorable airline economics and competition for funds with other needs.	M10.1 – Develop cost/benefit analysis to encourage airlines to implement in time to impact 2007 AvSP goals. M10.2 – Manufacturers/OEMs provide low cost upgrades for incentive.

Impact on Non-Part 121 or International Applications

Cabin equipage will become standardized between domestic and international carriers over time. Procedures may remain distinct between international and domestic carriers except as they demonstrate lower injuries and lower operator costs which would induce international carriers to adopt.