International Civil Aviation Organization
ICAO South American Regional Office
Thirteenth Meeting of the Civil Aviation Authorities of the SAM Region (RAAC/13)
(Bogota, Colombia, 4 – 6 December 2013)

Agenda Item 4: Priorities for the implementation of air navigation and safety improvements

PRIORITIES FOR THE IMPLEMENTATION OF SAFETY IMPROVEMENTS

(Presented by the Secretariat)

SUMMARY

This working paper (WP) presents the priorities for the implementation of improvements for the following SAM Region safety areas:

- ✓ safety oversight;
- ✓ accidents;
- ✓ runway excursions and incursions;
- ✓ aerodromes certification; and
- ✓ State safety programme (SSP) and safety management system (SMS) implementation.

References

- Global coordination meeting (GCM) of the Planning and implementation regional groups (PIRG) and Regional aviation safety groups (RASG) (Montreal, 19 March 2013);
- Air Navigation and Safety Directors Meeting of the SAM Region (Lima, Peru, 21 -22 October 2013);
- First edition of the ICAO Global aviation safety plan (GASP), revised version, (Doc 10004, 2013); and
- A38-XX Resolution –*ICAO global planning for safety and air navigation.*

ICAO Strategic Objectives:	*A – Safety* *C - Environmental Protection and Sustainable Development of Air Transport*

1. Introduction

1.1 The Global coordination meeting (GCM) of the Planning and implementation regional groups (PIRG) and Regional aviation safety groups (RASG) (Montreal, Canada, 19 March 2013), chaired by the ICAO Council President, agreed on the need of measuring performance improvement, backing up performance regional registry and establishing a group of indicators and metrics.

1.2 Taking into account the agreements reached by the PIRG and RASG Global coordination meeting, and the principle of transparency in the use of shared information, ICAO is leading the creation of the ***safety performance dashboard*** in the web page of each ICAO Regional Office in order to measure performance of the following safety areas:

- ✓ safety oversight;
- ✓ accidents;
- ✓ runway excursions and incursions;
- ✓ aerodromes certification; and
- ✓ State safety programme (SSP) and safety management system (SMS) implementation.

1.3 In this regard, on 21 and 22 October 2013, the Air Navigation and Safety Directors Meeting for the SAM Region took place in the ICAO South American Regional Office, in Lima, Peru. In this meeting, the performance indicators related to the areas above mentioned were analysed and the implementation targets and priorities for safety enhancement were defined.

2. Establishment of safety performance indicators, targets and enhancements in the SAM Region

2.1 S*afety oversight*

2.1.1 In order to establish targets and priorities for safety oversight in the SAM Region, indicators for this area have been defined based on results [effective implementation (EI)] obtained by each SAM Region State in the last activity carried out in terms of the ICAO Universal safety oversight audit programme (USOAP) continuous monitoring approach (CMA). In this regard, the Air Navigation and Safety Directors Meeting held in Lima, Peru, from 21 to 22 October 2013, agreed on the following target for this area:

Reach 80% of effective implementation (EI) in the SAM Region by December 2016.

2.1.2 In **Appendix A** to this WP, safety enhancement implementation priorities are being presented.

2.2 *Accidents*

2.2.1 Performance indicators in this area were obtained through the evaluation of information available at ICAO web site named: Occurrences – Pivot table on iSTARS accidents statistics. The sample information is referred to scheduled commercial air transport with aircrafts above ***2250 kg*** within **period 2005-2012**.

2.2.2 Through the information obtained it could be noted that the SAM Region reduced accidents gradually from year 2005 on, with the exception of year 2008, in which the accidents rate was abruptly incremented.

2.2.3 In the same way, the information provided by the Commercial aviation safety team (CAST) from the United States government aviation industry was also used. The accidents analysed occurred in the SAM Region during period 2002-2012, corresponding to LAR 121 operators or equivalent. In this study, CAST utilized a value of application of 50% over nine (9) safety enhancements (SE) (Please refer to **Appendices B and C**).

2.2.4 After an interesting debate, the Air Navigation and Safety Director Meeting agreed on the following target for the accidents area:

Reduce the SAM Region accident gap rate in 50% with regard to the global accident rate, by December 2016.

2.2.5 **Appendix A** to this WP presents safety enhancement implementation priorities for this area and **Appendices B and C** present CAST study and safety enhancements (SE) proposed by the Regional aviation safety group – Pan American (RASG-PA).

2.3 ***Runway excursions and incursions***

2.3.1 Based on the information obtained from ICAO Accident/Incident data reporting system (ADREP) for period 2005-2012, runway excursions in the SAM Region increased during years 2007, 2008, 2009 and 2011, though this rate decreased during years 2010 and 2012, reaching zero accidents in year 2012. Regarding runway excursions, the Air Navigation and Safety Directors Meeting agreed on the following target:

> *Reduce by 2016 the runway excursion rate in 20% with regard to the SAM (2005-2012) average rate.*

2.3.2 **Appendix A** to this WP presents safety enhancement priorities for this area.

2.4 ***Aerodromes certification***

2.4.1 Information on this area is being presented in WP/09.

2.5 ***SMS/SSP implementation***

2.5.1 2.5.1 With regard to SSP implementation, the Air Navigation and Safety Meeting expressed that the progress of this system depended on progress made in the development of regulations related to the protection of information sources. Therefore, the following targets were agreed by December 2016:

- ✓ *Reach 67% SSP implementation; and*
- ✓ *Reach 100% SMS oversight capacity of services suppliers.*

3. **Suggested actions**

3.1 The Meeting is invited to:

a) take knowledge of the information presented in this working paper and appendices; and
b) comment on safety enhancement implementation priorities presented in **Appendices A, B and C** to this WP.

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APPENDIX A

SAFETY ENHANCEMENT IMPLEMENTATION PRIORITIES

1. **SAM Region safety oversight – Effective implementation (EI) improvement**

1.1 The Regional South American Office will encourage SARPs effective implementation in SAM States, especially in those States showing a rate below the established targets. The objective of this action is that each State improves its EI in order that the SAM Region is able to reach the targets agreed upon by the meeting. Therefore, SAM States are encouraged to commit themselves to maintain updated and to improve their corrective action plans (CAPs).

1.2 Additionally to the CAPs improvement, the following specific safety enhancements for the SAM States and for the Regional Safety Oversight Cooperation System (SRVSOP) States, during the period January 2014 - December 2016:

1.2.1 For SRVSOP States:

- ✓ regulations harmonization;
- ✓ inspectors guidance material harmonization;
- ✓ service providers guidance material harmonization, for example, advisory circulars (AC), acceptable means of compliance (AMC) and interpretative and explanatory material (IEM)
- ✓ Assistance to the States that require it in the following areas:
  - ➢ training;
  - ➢ certification; and
  - ➢ approvals
- ✓ effective implementation of the following surveillance systems for air services operators:
  - ➢ Safety ramp inspections data exchange programme (IDISR); and
  - ➢ Dangerous goods coordinated oversight programme (VCMP) (SRVSOP members).

1.2.2 For States that are not members of the SRVSOP

- ✓ Air operator certificate registry (AOC).

1.3 **Improvement of effective implementation (EI) by audit area**

1.3.1 ANS

- ✓ LAR ANS development.
- ✓ LAR ANS orientation material development.
- ✓ ANS regulations harmonization among SAM States.
- ✓ ANS requirements and procedures effective implementation.
- ✓ ANS providers SMS implementation.

1.4 **Effective implementation (EI) improvement by critical element**

1.4.1 CE- 4 – Technical personnel qualification and training

- ✓ Standardization of SAM States inspectors' instruction programmes.
- ✓ SRVSOP support through training courses for States that request it.
- ✓ Development and effective implementation of a multinational training system through ICAO South American Regional Office and SRVSOP web pages.

2. **Accidents**

2.1 For the following three fatal accidents: loss of control in-flight (LOC-I), control flight into terrain (CFIT) and runway excursions (RE), the following safety enhancements are being proposed:

2.1.1 **Loss of control in-flight (LOC-I)**

- ✓ Effective implementation in all SAM States of the requirements related to upset prevention and recovery training (UPRT). These requirements permit the mitigation of occurrences related to the aircraft loss of control. Proposals for amendments of Annex 1, Annex 6, Part I, and PANS-TRG are to be applied by 13 November 2014, and the UPRT requirements for Latin American Regulations (LAR) should be applied by the same date.
- ✓ Effective implementation of reactive and proactive data collection systems, hazard identification and risk management related to LOC-I.
- ✓ Effective implementation of the ICAO evidence-based training (EBT) or advanced qualification programme (AQP) (loss of control in-flight scenarios).
- ✓ Effective implementation of predictive data collection systems, hazard identification and risk management related to LOC-I.
- ✓ Implementation of a supervision advanced system that includes reactive, proactive and predictive systems related to LOC-I.

2.1.2 **Control flight into terrain (CFIT)**

- ✓ Continue with the effective implementation in all SAM States of CFIT training aid containing the ALAR took kit of Flight Safety Foundation (FSF).
- ✓ Effective implementation of reactive and proactive data collection systems, hazard identification and risk management related to CFIT.
- ✓ Effective implementation of the ICAO evidence-based training (EBT) or advanced qualification programme (AQP) (CFIT scenarios).
- ✓ Effective implementation of predictive data collection systems, hazard identification and risk management related to CFIT.
- ✓ Implementation of a supervision advanced system that includes reactive, proactive and predictive systems related to CFIT.

3. **Runway excursions**

3.1 The following safety enhancements are being proposed to reduce the rate of accidents by runway excursions:

- ✓ Implementation of ICAO tool kit on runway safety.
- ✓ Effective implementation of runway safety teams (RST) in international aerodromes.
- ✓ Effective implementation of safety reactive, proactive and predictive processes (FDA) related to runway excursions in commercial air transport operators.
- ✓ Effective implementation of ICAO evidence-based training (EBT) or advanced qualification programme (AQP) (unstable approach landing scenarios).
- ✓ Effective implementation of RST in most important domestic aerodromes.
- ✓ Effective implementation of safety reactive, proactive and predictive processes (FDA) related to runway excursions in general aviation operators.
- ✓ Installation of aircrafts runway excursions prevention systems.
- ✓ Effective implementation of an advanced supervision system for the oversight of reactive, proactive and predictive processes addressed to the treatment of runway excursion related hazards.

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APPENDIX B

CAST Spreadsheet Tool Panamanian and South American Operator Accidents

RASG-PA Safety Enhancements

RE/04, RE/09, CFIT/02, CFIT/04, LOC-I/06, LOC-I/07, LOC-I/9, RE/8, RE/11

Accident Set Used For Evaluation

2002-2012 Hull Loss and Fatal Accidents (46) - (Panamanian and South American Domicile Operators With Operations Similar to Part 121)

Notes:

Preliminary Assessment (SE Effectiveness Values) performed by FAA AVP-200;

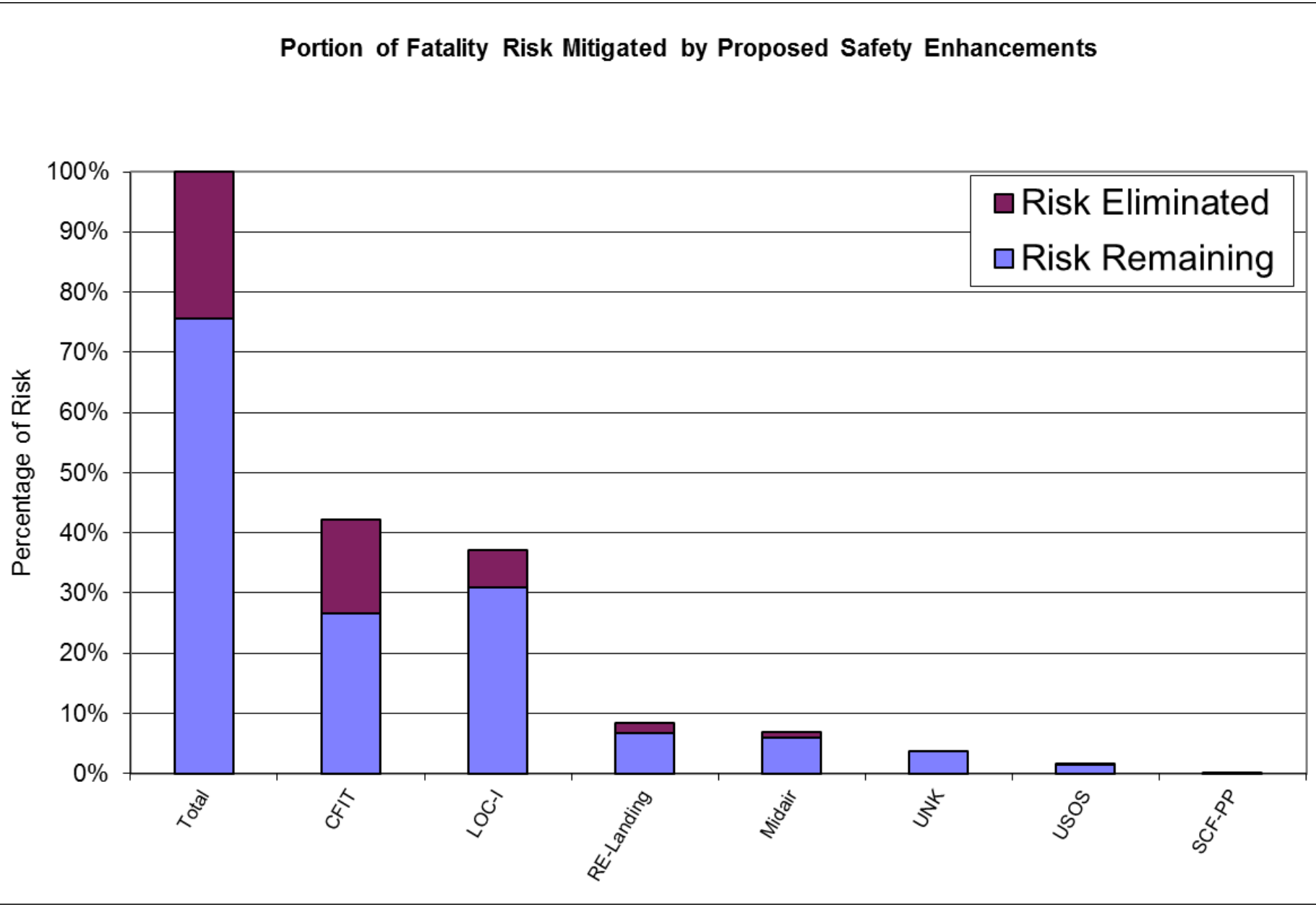
A Preliminary SE Implementation Value of 50% was used for all 9 SEs
(Portion of Fleet or Risk Population with SE Implemented)

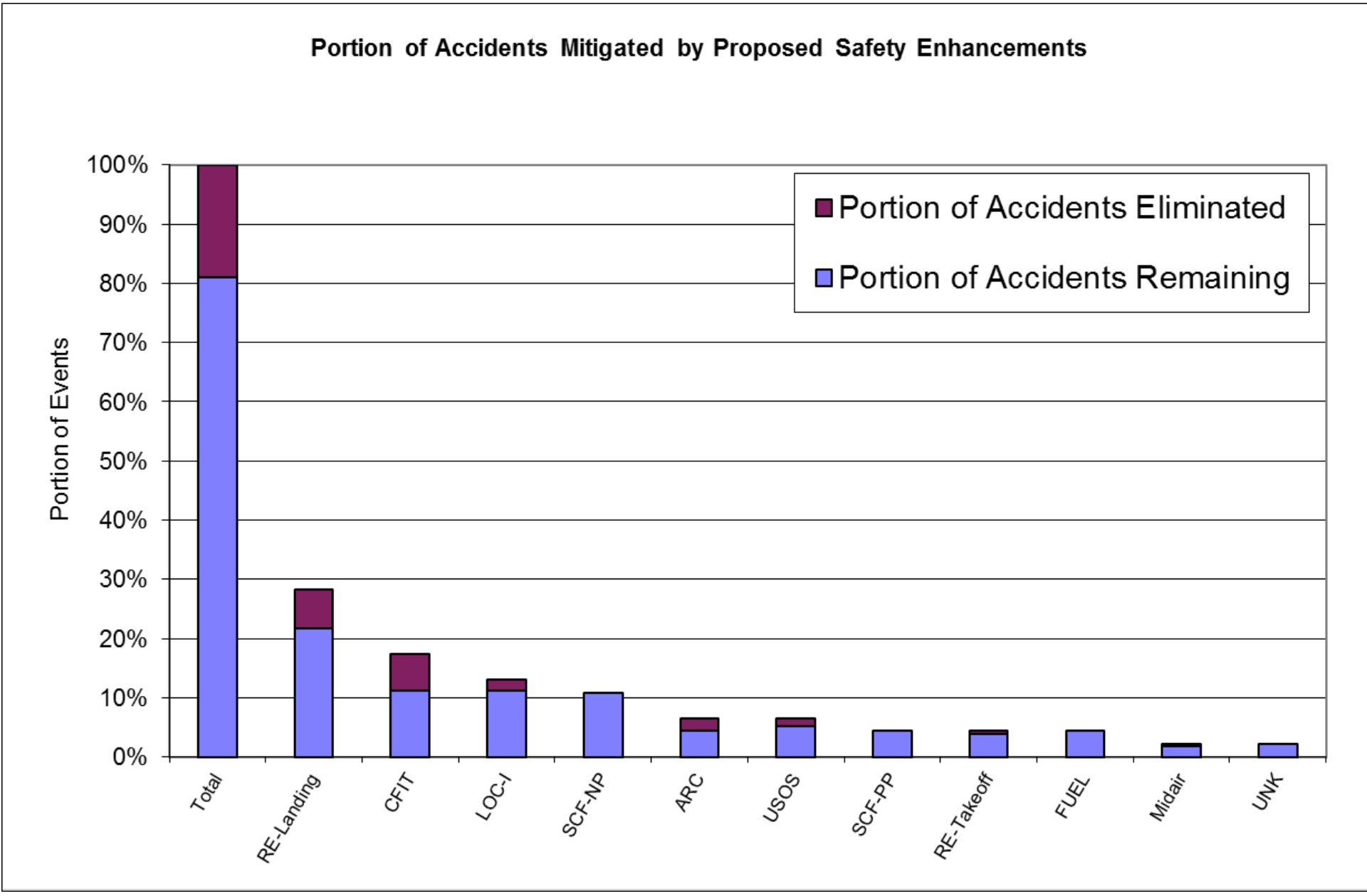
						Safety Enhancement								
						RE/04	RE/09	CFIT/02	CFIT/04	LOC-I/06	LOC-I/07	LOC-I/9	RE/8	RE/11
						Implementation Value				Implementation Value				
						.500	.500	.500	.500	.500	.500	.500	.500	.500
						Safety Enhancement Effectiveness (%/100)				Safety Enhancement Effectiveness (%/100)				
Date	Airplane	Jet/Turbo Prop	Airline	Location	Portion of Event Eliminated									
1/28/2002	B727-100	Jet	TAME	(near) Ipiales	.420	.150	.100	.375	.150	.050	.000	.200	.000	.000
3/18/2002	B727	Jet	VARIG	Belo Horizonte, BR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
6/14/2002	DC-9	Jet	Inter (Colombia)	Neiva, CO	.487	.300	.300	.000	.200	.250	.150	.050	.000	.000
8/30/2002	Fokker 100	Jet	TAM Linhas Aereas	Birigui, BR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
8/30/2002	EMB-120 Brasilia	TP-Small	RICO Linhas Aereas	(near) Rio Branco,	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
9/14/2002	ATR 42	TP-Large	Total Linhas Aereas	(near) Paranapane	.220	.000	.050	.000	.000	.000	.400	.000	.000	.000
1/9/2003	Fokker F.28	Jet	TANS	(near) Chachapoya	.462	.300	.100	.150	.400	.000	.000	.200	.000	.000
1/26/2003	B737 (JT8D)	Jet	VASP	Rio Branco, BR	.306	.000	.050	.150	.000	.200	.200	.100	.000	.000
10/20/2003	Fokker F.27	TP-Large	TAVAJ	Tarauaca, BR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
10/26/2003	Fairchild FH-227	TP-Large	CATA Linea Aerea SA	(near) Buenos Aire	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
12/13/2003	B737 (JT8D)	Jet	Nuevo Continente	Lima, PE	.522	.500	.300	.000	.000	.000	.000	.500	.000	.000
12/18/2003	DC-9	Jet	Lineas Aereas Suram	(near) Mitu, CO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
5/14/2004	EMB-120	TP-Small	RICO Linhas Aereas	(near) Manaus, BR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
10/23/2004	B707	Jet	Beta Cargo	Manaus, BR	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
11/18/2004	Jetstream 31	TP-Small	Venezolana	Caracas, VE	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1/8/2005	MD-80	Jet	AeroRepublica Colomb	Cali, CO	.469	.500	.200	.000	.300	.100	.000	.050	.000	.000
2/22/2005	Convair 580	TP-Large	TAM - Transporte Aer	Trinidad, BO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
4/7/2005	Fokker F.28	Jet	ICARO Air	Coca, EC	.213	.300	.000	.000	.000	.000	.000	.050	.100	.000
8/16/2005	MD-80	Jet	West Caribbean Airw	(near) Machiques,	.536	.000	.000	.000	.050	.300	.600	.400	.000	.000
8/23/2005	B737 (JT8D)	Jet	TANS	(near) Pucallpa, PE	.563	.500	.100	.150	.400	.000	.300	.050	.000	.000
4/16/2006	Fokker F.27	TP-Large	TAM - Transporte Aer	Guayaramerin, BO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
6/1/2006	Jetstream 31	TP-Small	Air Panama	Bocas de Toro, PA	.166	.200	.000	.000	.000	.000	.000	.050	.100	.000
8/17/2006	B727	Jet	Aerosucre Colombia	Bogota, CO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
9/29/2006	B737 (NG)	Jet	GOL Linhas Aereas	(near) Peixoto Aze	.145	.000	.000	.000	.100	.000	.000	.200	.000	.000
11/17/2006	DC-10	Jet	Cielos Airlines	Barranquilla, CO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
11/18/2006	B727	Jet	Aerosucre Colombia	(near) Leticia, CO	.541	.400	.100	.150	.550	.000	.000	.200	.000	.000
2/4/2007	DC-8-71F	Jet	Tampa Cargo	MIAMI	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
7/17/2007	Airbus A320	Jet	TAM Linhas Aereas	Sao Paulo, BR	.248	.200	.000	.000	.100	.100	.000	.050	.100	.000
7/17/2007	EMB 190	Jet	AeroRepublica Colomb	Santa Marta, CO	.707	.500	.125	.150	.400	.500	.000	.500	.000	.000
10/31/2007	Fokker F.27	TP-Large	Air Panama	Panama City, PA	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1/28/2008	Dash 8-200	TP-Large	Aires Colombia	Bogota, CO	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
2/1/2008	B727-200	Jet	LAB	Near Trinidad	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
2/21/2008	ATR-42-300	TP-Large	Santa Barbara Airlines	(near) Merida, VE	.575	.050	.000	.400	.500	.200	.300	.100	.000	.000
7/23/2008	F.27-400	TP-Large	TAM - Transporte Aer	70nm from Guayar	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
9/22/2008	F-28-4000	Jet	ICARO	QUITO	.231	.200	.000	.000	.200	.000	.000	.000	.100	.000
10/16/2008	B737-200	Jet	Rutaca	CARACAS	.188	.200	.000	.000	.100	.000	.000	.000	.100	.000
5/17/2009	DHC-6-300	TP-Small	Aeroperlas	Carti, PA	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
5/5/2010	ERJ-145LR	Jet	SATENA	Mitu-Fabio, Colombi	.373	.500	.100	.000	.100	.100	.000	.050	.000	.000
8/16/2010	B737-73V (WL)	Jet	AIRES Colombia	San Andres, Colom	.375	.500	.100	.000	.200	.000	.000	.050	.000	.000
9/13/2010	ATR-42-320	TP-Large	Conviasa	Puerto Ordaz, Ven	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
1/25/2010	Embraer 110C Ban	TP-Small	Piquiatuba Táxi Aéreo	near Senador José	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
5/18/2011	SF34A (26)	TP-Large	SOL Líneas Aéreas	Prahuaniyeu, Arge	.123	.000	.000	.000	.200	.000	.050	.000	.000	.000
9/6/2011	SA-227BC Metro III	TP-Small	Aerocon	Trinidad, Bolivia	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
9/16/2011	EMB 190(5)	Jet	TAME	Quito,Ecuador	.390	.500	.100	.150	.000	.000	.000	.050	.100	.000
9/26/2011	DC-9(35)	Jet	Aeropostal	Puerto Ordaz,Vene	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
8/24/2012	Boeing (McDonnell-	Jet	Aserca Airlines	Mayor Buenaventu	.451	.500	.100	.150	.200	.100	.000	.050	.000	.000

										1	2	3	4	5	6	7	8	9
										Safety Enhancement								
			%	%	% of	Total	Total	% Total		RE/04	RE/09	CFIT/02	CFIT/04	LOC-I/06	LOC-I/07	LOC-I/9	RE/8	RE/11
	Number of	Sum total of	Severity	Events	Category	Events	Severity	Fatality	% Total	Implementation Value								
Category	Events by	severity	by	by	Severity	Eliminated	Eliminated	Risk	Events	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Definition	Category	by category	category	category	Eliminated	by Category	by Category	Eliminated	Eliminated	Severity eliminated by SE								
CFIT	8.00	6.06	42.1%	17.4%	36.8%	2.87	2.23	15.5%	6.2%	0.55	0.17	0.57	0.88	0.13	0.21	0.36	0.00	0.00
LOC-I	6.00	5.33	37.1%	13.0%	16.5%	0.88	0.88	6.1%	1.9%	0.00	0.03	0.00	0.13	0.15	0.53	0.20	0.00	0.00
RE-Landin	13.00	1.22	8.5%	28.3%	20.3%	3.01	0.25	1.7%	6.5%	0.10	0.00	0.00	0.05	0.05	0.00	0.03	0.05	0.00
SCF-PP	2.00	0.03	0.2%	4.3%	0.0%	0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCF-NP	5.00	0.00	0.0%	10.9%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Midair	1.00	1.00	7.0%	2.2%	14.5%	0.15	0.15	1.0%	0.3%	0.00	0.00	0.00	0.05	0.00	0.00	0.10	0.00	0.00
FUEL	2.00	0.00	0.0%	4.3%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RE-Takeof	2.00	0.00	0.0%	4.3%		0.23	0.00	0.0%	0.5%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNK	1.00	0.52	3.6%	2.2%	0.0%	0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WSTRW	0.00	0.00	0.0%	0.0%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
USOS	3.00	0.22	1.5%	6.5%	2.7%	0.59	0.01	0.0%	1.3%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ADRM	0.00	0.00	0.0%	0.0%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ARC	3.00	0.00	0.0%	6.5%		0.99	0.00	0.0%	2.2%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIRE-NI	0.00	0.00	0.0%	0.0%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ramp	0.00	0.00	0.0%	0.0%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.0%	0.0%		0.00	0.00	0.0%	0.0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	46	14.39				8.7	3.5	24.4%	18.9%	.7	.2	.6	1.1	.3	.7	.7	.1	.0
	Events	Total Severity																

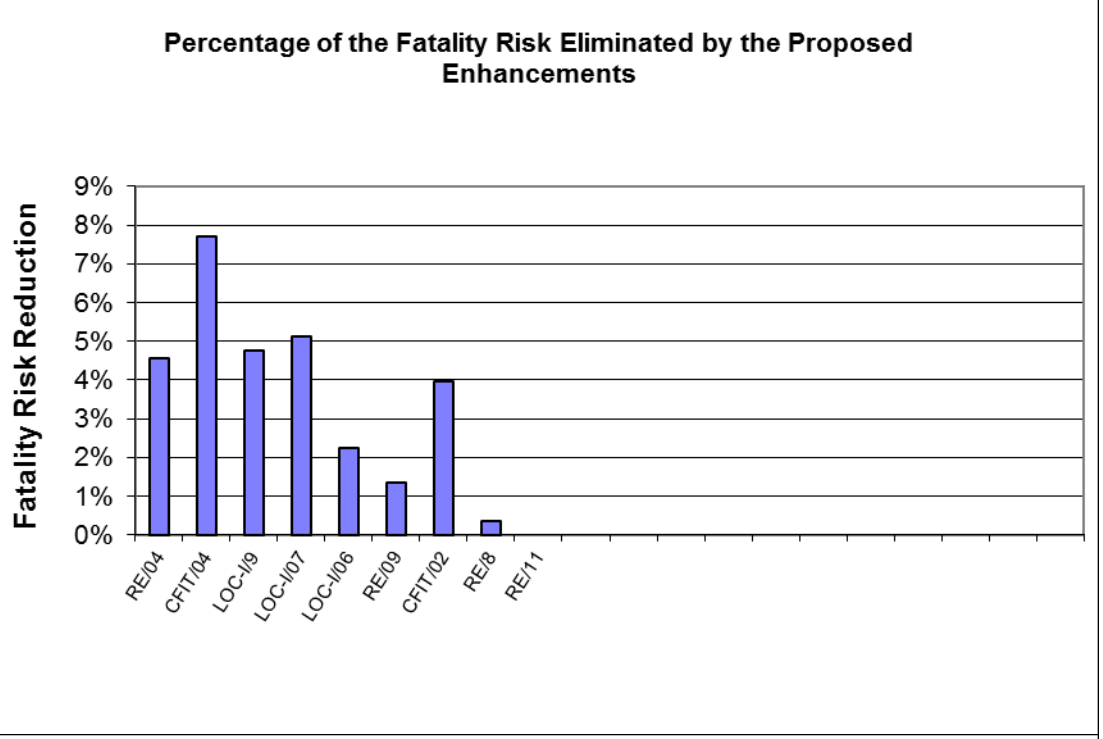
						JIMDAT Score (Percentage of Risk and Accidents Eliminated by SE Acting on its Own)			
						1	2	3	4	5	6	7	8	9
						RE/04	RE/09	CFIT/02	CFIT/04	LOC-I/06	LOC-I/07	LOC-I/9	RE/8	RE/11
		% Fatality Risk Eliminated	24.4%			4.6%	1.4%	3.9%	7.7%	2.3%	5.1%	4.8%	0.3%	0.0%
		% Total Event Eliminated	18.9%			6.8%	2.0%	2.0%	4.5%	2.1%	2.2%	3.2%	0.7%	0.0%

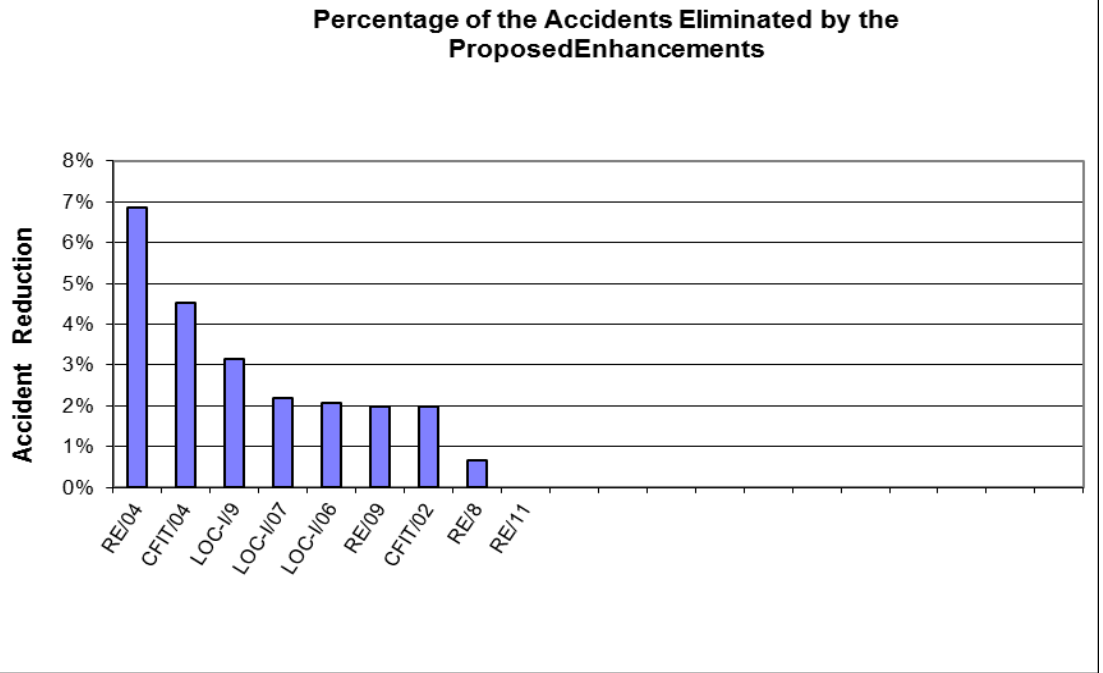
Color Coding	
	Data Entry Field
	Linked Field
	Calculation/Output Field
	Calculation/Output Field
	Summary Output


Portion of Fatality Risk Mitigated by Proposed Safety Enhancements
Percentage of Risk
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Risk Eliminated
Risk Remaining
Total
CFIT
LOC-I
RE-Landing
Midair
UNK
USOS
SCF-PP


Portion of Accidents Mitigated by Proposed Safety Enhancements
Portion of Events
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Portion of Accidents Eliminated
Portion of Accidents Remaining
Total
RE-Landing
CFIT
LOC-I
SCF-NP
ARC
USOS
SCF-PP
RE-Takeoff
FUEL
Midair
UNK

Assumes Each Safety Enhancement is Acting on Its Own





Unmitigated Fatality Risk From High to Low

Categor	Date	Airplane	Jet/Turbo Prop	Airline	Location	Remaining Severi
LOC-I	10/26/2003	Fairchild FH-227	TP-Large	CATA Linea Aerea SA	(near) Buenos Aires, AR	1.000
LOC-I	12/18/2003	DC-9	Jet	Lineas Aereas Surame	(near) Mitu, CO	1.000
CFIT	9/6/2011	SA-227BC Metro I	TP-Small	Aerocon	Trinidad, Bolivia	0.889
LOC-I	5/18/2011	SF34A (26)	TP-Large	SOL Líneas Aéreas	Prahuaniyeu, Argentina	0.878
MIDAIR	9/29/2006	B737 (NG)	Jet	GOL Linhas Aereas	(near) Peixote Azevedo, BR	0.855
LOC-I	9/14/2002	ATR 42	TP-Large	Total Linhas Aereas	(near) Paranapanema, BR	0.780
CFIT	8/30/2002	EMB-120 Brasilia	TP-Small	RICO Linhas Aereas	(near) Rio Branco, BR	0.767
RE-Landin	7/17/2007	Airbus A320	Jet	TAM Linhas Aereas	Sao Paulo, BR	0.752
CFIT	1/28/2002	B727-100	Jet	TAME	(near) Ipiales	0.580
CFIT	1/9/2003	Fokker F.28	Jet	TANS	(near) Chachapoyas, PE	0.538
UNK	5/14/2004	EMB-120	TP-Small	RICO Linhas Aereas	(near) Manaus, BR	0.524
LOC-I	8/16/2005	MD-80	Jet	West Caribbean Airway	(near) Machiques, VE	0.464
CFIT	11/18/2006	B727	Jet	Aerosucre Colombia	(near) Leticia, CO	0.459
CFIT	2/21/2008	ATR-42-300	TP-Large	Santa Barbara Airlines	(near) Merida, VE	0.425
LOC-I	9/13/2010	ATR-42-320	TP-Large	Conviasa	Puerto Ordaz, Venezuela	0.333
USOS	1/25/2010	Embraer 110C Ba	TP-Small	Piquiatuba Táxi Aéreo	near Senador José Porfirio, Bra	0.200
RE-Landin	11/18/2004	Jetstream 31	TP-Small	Venezolana	Caracas, VE	0.190
CFIT	8/23/2005	B737 (JT8D)	Jet	TANS	(near) Pucallpa, PE	0.178
RE-Landin	4/16/2006	Fokker F.27	TP-Large	TAM - Transporte Aere	Guayaramerin, BO	0.032
SCF-PP	7/23/2008	F.27-400	TP-Large	TAM - Transporte Aere	70nm from Guayaramerin, BO	0.028
USOS	8/16/2010	B737-73V (WL)	Jet	AIRES Colombia	San Andres, Colombia	0.010

	A	B	C	D	E	F	G	H
1					**DETAILED IMPLEMENTATION PLANS (DIPs) by PA-RAST/11**			
2	**#**	**DIP**	**Description**	**Champion**	**Output**	**Deadline**	**Status**	**Comments**
3	1	RE/04	Promote pilot adherence to Standard Operating Procedures (SOPs) for approach procedures including go-around decision making process	ALTA	1) Distribution	18/01/11	Completed	
4					2) Training		Completed	
5	2	RE/09	Specific Training for pilots and air traffic controllers to avoid unstabilized approaches	ALTA	1) ALTA will conduct a survey within its operators regarding the actions taken to mitigate unstable approaches.	20/02/11	Completed	
6								
7					2) Develop a strategy to deliver safety seminars for pilots and controllers in Pan America that targets recognition and avoidance of unstable approaches.	31/12/12	In process	Updated: 5 December 2012. ALTA, IFALPA, IFATCA currently working on the script and working on video budget funding.
8								
9	3	CFIT/02	Specific ALAR/CFIT Training for Pilots	IATA	1) CAA conducts a review of all operators to ascertain which operators have CFIT prevention training and procedures in their approval training	20/02/11	Completed	
10					2) If an operator does not have a CFIT training, it will be encourage to incorporate CFIT training into the airline training program.	20/12/11	Completed	
11	4	CFIT/04	CRM/Situational Awareness for pilots and air traffic controllers	IFALPA & IFATCA	1) Incorporate and/or update CRM/situational awareness training programs for all flight crew members of air transport operators emphasizing aircraft position with relation to terrain and reviewing past ocurrences.	20/02/12	In process	IFALPA is coordinating with IATA and IFATCA the development of a video for pilots and air traffic controllers regarding Crew Resource Management (CRM).
12								
13					2) Incorporate CRM/situational awareness training programs for all air traffic controllers and air navigation service providers (ANSP) emphasinzing aircraft position with relation to minimum allowable	20/08/12	In process	
14								
15	5	LOC-I/06	LOC Training – Human factors and automation	PA-RAST	1) Review and evaluate the advisory circular created by the ICAO COSCAP's in Asia	20/02/11	Completed	
16								
17					2) ICAO will distribute a copy of the developed generic advisory circular to each State in the region.	20/03/11	Completed	
18					3) Each State in the region wil use the generic advisory circular as a template to prepare a State Advisory Circular on mode awareness and energy state management aspects of flight deck automation.	20/09/11	Completed	
19								
20					4) Mode awareness and energy state management aspects of flight deck automation guidance is provided by operators to all their pilots.	20/09/12	Completed	
21	6	LOC-I/07	LOC Training – Advanced maneuvers	ALTA	1) Listing of training materials available from regulators, industry, operators, academia and other resources.	18/01/11	Completed	
22					2) Advanced Maneuvers Training provided to all operators.	18/04/11	Completed	
24					3) Advanced Maneuvers Training provided by all operators. The expectation is that this training will be accomplish during initial training and as part of the recurrent training program via ground and simulator instruction within the certified flight envelope, with enphasis on recognition, prevention and recovery technique.	18/08/13	Superseded	
25								

	A	B	C	D	E	F	G	H
26	7	LOC-I/9	Loc Training - Pilot monitoring policies and procedure for the operator and training program for crews	IFALPA	1) Listing of training materials available from industry, operators and other resources.	20/02/11	Completed	
27					2) Raise awareness of availability and need of Pilot Monitoring Training.	20/03/11	Completed	
28					3) Pilot Monitoring Training material provided to all operators.	20/03/11	Completed	
29					4) Pilot Monitoring Training provided by operators to all their pilots.	20/09/12	Completed	
30	8	RE/8	Guidance in maintaining runway in accordance with Annex 14	ACI-LAC	1) Create a guide that collects best practices for runway maintenance	18/04/12	Completed	
32					2) Promote and encourage the use of the guide		In process	ESC requested ACI-LAC to provide enhanced Manual for approval and dissemination.
33					3) Airports implement their maintenance plans according to the runway maintenance guide.		In process	
34								
35	9	RE/11	Develop guidance material and training programs to create action plans for runway safety teams	DGAC Mexico	1) Gather and publish in the RASG-PA website available material that may be used in to mitigate hazards related to runway safety.		Completed	
36								
37								
38					2) Electronic checklist development.		In process	Updated: 6 December 2012. Mexico DGAC is developing the Toolkit to be presented to the PA-RAST for approval. Considering that the electronic checklist will be part of the Toolkit they requested that Output 2 be removed from the DIP.
39					3) Establishment of a regional Runway Safety Database.	25/02/12	In process	Updated: 6 December 2012. Mexico DGAC considered that the Output 3 would not be feasible and request to be removed from the DIP.
40								To be reviewed with the Champion
41					4) Develop a roll out plan.	25/08/12	In process	Updated: 6 December 2012. Mexico DGAC considered that the Output 4 must be coordinated with PA-RAST due to the need of resurces for delivering the workshops.
42					X) Launch of the RST Toolkit			Updated: 6 December 2012. Mexico DGAC suggested to include the new Output X for launching the Toolkit
43					5) Review and update of the Runway Safety Teams.		In process	Updated: 6 December 2012. Mexico DGAC considered that the Output 5 is monitored by the ICAO NACC and SAM and RASG-PA, and the material is updated by ICAO HQ. Therefore, they requested to be removed from the DIP.

GSI #	Description	Champion	Output	Deadline	Status	Comments
3	Protection of Safety Information	COCESNA				
12	Sharing of Information Safety Data	RASG-PA	ASIAS/RASG-PA data sharing			
		IATA/ALTA	IATA/ALTA Trend Sharing Program			
		DGAC CR	PASO			
		ANAC	BRAZIL			
4	Accident/Incident Regional Board	COCESNA				
	Business case for thechnology to mitigate runway excursions	ICAO LIM				
	Spanish Standard Phraseology	ALTA				Using PANS-ATM (DOC 4444) Chapter 12
	Bird Strike Risk Reduction Program	IATA/ALTA	PTY	Aug-13	To start Jun 2012	Biologist apointed, gathering pre-assessment requierements
			GYE	Aug-13	To start Jun 2012	

ESC Approved Detailed Implementation Plans (DIPs)

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/RE/04	Promote pilot adherence to Standard Operating Procedures (SOPs) for approach procedures including go- around decision making process.		9	High	Easy	P1	1	Short

Safety Enhancement Action (expanded):	Promoting pilot adherence to Standard Operating Procedures (SOPs) which would include stabilized approach criteria and go/no go take-off decision making procedures is key to preventing and reducing the risk of runway excursions. Reviewing existing operational policies, procedures and programs is also part of an overall strategy in mitigating runway excursion risk.
Statement of Work:	Runway Excursion has been identified as the highest safety risk area in Pan America. In order to proactively reduce this risk, RASG-PA chartered the Regional Aviation Safety Team (RAST) to review runway excursion information and develop mitigation strategies to reduce this risk.
Champion Organization:	ALTA
Human Resource:	ICAO (NACC, SAM, HQ), IATA, ALTA, ACSA, FSF, CANSO, aircraft manufacturers, ALPA, IFALPA, IFATCA, CAA's, and other stakeholders.
Financial Resource:	10000
Relation Current Aviation Community Initiative:	IATA Runway Excursion Risk Reduction toolkit/FSF: ALAR toolkit (version June 2010) Colegio de Pilotos Aviadores de México: Aeronautical Decision Management Training
Performance Goal Indicators:	Goal 1: target audience(s): Latin America and Caribbean, will value the information provided (1) Objective: educate the target audience(s) (2) Indicator: to reach 80% of the airlines pilots in the Region (3) Indicator: to reach 80% of other stakeholders as determined by the research. Goal 2: increase the awareness on runway excursions (1) Objective: reduce the number of events (2) Indicator: reduction of 80% of the events in the region
Key Milestones:	• Authorization by IATA to upload copyright material from RERR Toolkit in RASG-PA website: pending • Release of State letters from RASG-PA Secretariat recommending establishment of SOPs: SCA+02 • RAST – PA Report from metrics regarding RE/04: Upon completion of Output 2 +03
Potential Blockers:	a)Strategic Challenges i)Incorporate new audience in addition to airline's pilots ii)Distribution of training material to airlines

iii)Distribution of training material to non-airline pilots
iv)Establish and maintain communication with the Pan American pilots and other stakeholders
v)Operators to include recommendations into their Manual of Operations
vi)Operators to include recommendations into their training programmes
vii)Get feedback
viii)Metrics to determine penetration of this programme

DIP Notes: **1. Research to determine the target audience(s) Determine the specific groups of pilots to be reached in order to achieve our objective Determine other stakeholders that would benefit.**

2. Communication and distribution options: Letter from RASG-PA Secretary to recommend that all operators establish SOP's that include stabilized approach criteria for pilots and a no fault go-around policy for unstable approaches, mentioning the FSF/IATA Runway Excursion Risk Reduction Tool Kit. Letter from RASG-PA Secretary to States recommending that all operators establish SOP's that include stabilized approach criteria for pilots and a no fault go-around policy for unstable approaches, mentioning the FSF/IATA Runway Excursion Risk Reduction Tool Kit.

3. Press releases from ALTA, IATA, IFALPA. 4. RASG-PA website news release, uploading of training material and E-mails to target audience

Keep in mind that there is no contradiction with the pressure for pilots in the subsequent flight analysis.

RAST-PA/RE/04 Output 1

Description: Distribution

Resources:

Resource Notes: Cost of the material and distribution to the operators.

Time Line: SCA+ 5 months

Actions: 1. RAST/RE recommends that all operators establish SOP's that include stabilized approach criteria for pilots and a no fault go-around policy for unstable approaches. 2. In coordination with FSF and IATA, RAST/RE should develop an awareness campaign to promote the adherence to SOP's for approach procedures including the go-around decision making process. The campaign will distribute the FSF/IATA Runway Excursion Risk Reduction Tool Kit, the Colegio de Pilotos Aviadores de Mexico Aeronautical Decision Management training, and any other available material. 3. Time to train trainers

Target Completion Date: 12

RAST-PA/RE/04 Output 2

Description: Training

Resources:

Resource Notes: Variable costs depending on the operator.

Time Line: SCA+ 15 months

Actions: Operators to include material in training programs.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/RE/08	Guidance in maintaining runway in accordance with Annex 14 (put this point next to 6)	Annex 14, Doc 9137 ICAO	1	High	Easy	P1	3	Short

Safety Enhancement Action (expanded):	To reduce runway condition/maintenance related accidents and incidents at airports by following a runway maintenance guide in accordance with ICAO Annex 14.
Statement of Work:	Establish a team who will compile and develop, if necessary, runway maintenance guidance for airports in the Panamerican region.
Champion Organization:	ACI-LAC
Human Resource:	CAAs, ICAO, ACI, IATA, ALACPA, Airport Operators, Maintenance staff and providers.
Financial Resource:	To be determined, in-kind support to develop the guidance material.
Relation Current Aviation Community Initiative:	ACI Airside Safety Handbook Annex 14 ICAO Doc 9137 Airport Services Manual Par 2 – Pavement Surface Conditions ICAO Doc 9157 Part 4 Visual Aids Runway excursion risk reduction toolkit
Performance Goal Indicators:	Goal 1: Create a guide that collects best practices for runway maintenance. Indicator: Online availability of the guide. Goal 2: Promote and encourage the use of the guide. Indicator: RASG-PA promotion of the guide. Goal 3: airports implement their maintenance plans according to this guide. Indicator: A measurable amount of airports that incorporate the use of the guide into their action plans. Goal 4: Reduce the occurrence of runway condition related incidents and accidents. Indicator: A measurable and continued reduction in runway condition related incidents and accidents.
Key Milestones:	DIPESC X — Approval Output 1 The guide — ESC X Date + 6

Output 2 Promote	Output 1 + 12
Output 3 Implementation of the guide	Output 1 + 18

Potential Blockers:
- Lack of resources to establish the plans correctly
- Differences between CAAs and airport operators
- Weaknesses in regulatory oversight
- Airport operators may not recognize safety enhancement benefits of implementing the plan according to the guidelines
- Data sharing

DIP Notes: RASG-PA, Annual Safety Report Team (ASRT), will review collected data on a yearly basis. This data will be reflected in the annual RASG-PA Safety Report

RAST-PA/RE/08 Output 1

Description: Create a guide that collects best practices for runway maintenance.

Resources:

Resource Notes: ACI

Time Line: 6 months

Actions: Establish a team who will compile and develop, if necessary, runway maintenance guidance for airports in the Pan American region. The team should be composed of at least; an ICAO Annex 14 expert, a representative from aerodromes and Aerodrome cognizant CAA representative. Once available the guidance should be translated into Spanish.

Target Completion Date:

RAST-PA/RE/08 Output 2

Description: Promote and encourage the use of the guide.

Resources:

Resource Notes: RASG-PA

Time Line: 12 months

Actions: Produce information material that may be disseminated at events throughout the Region. Call on RASG-PA Members to disseminate the information.

Target Completion Date:

RAST-PA/RE/08 Output 3

Description: Airports implement their maintenance plans according to the runway maintenance guide.

Resources:

Resource Notes: ACI, RST's

Time Line: 18 months

Actions: Use a data-driven approach to identify aerodromes that could benefit from improved runway maintenance. Encourage RST at Airports to use the runway maintenance guide and track outcomes through their action plans. Track aerodrome action plans to determine the number of aerodromes that are using the guide.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/RE/09	Specific Training for pilots and air traffic controllers to avoid unstabilized approaches		9	High	Easy	P1	2	Short

Safety Enhancement Action (expanded):	Develop safety seminars for pilot and air traffic controllers to mitigate the causes of unstable approaches in Pan America.
Statement of Work:	Runway Excursion has been identified as one of the highest safety risk area in Pan America. In order to proactively reduce this risk, RAST in collaboration with ALTA will develop safety seminars for pilots and controllers that will provide specific training and tools to mitigate the causes of unstable approaches and related actions as requiered.
Champion Organization:	ALTA
Human Resource:	IATA, ATA, ATAC, ACSA, ICAO, aircraft manufacturers, IFALPA, IFATCA, flight data analysis companies (Sagem, ADI, Airfase, etc.), organizations, CANSO, local pilot and air traffic controller associations, flight academies, training centers and other stakeholders.
Financial Resource:	Costs would be shared by the operators, manufacturers, pilot associations and governments.
Relation Current Aviation Community Initiative:	- Runway Safety Action Teams (RSAT); local equivalent collaborative teams in Pan America.
Performance Goal Indicators:	Goal: reduce occurrence of runway excursion accidents. Indicator: a measurable reduction of runway excursion incidents and accidents.
Key Milestones:	The following milestones are based on the date of SCA approval (months): - Survey & Reports SCA + 6 - Seminars Output 1 + 24
Potential Blockers:	- Insufficient funds to conduct seminars - Inadequate implementation of recommendations from outputs - Participation from industry - Human resources, specialists, facilitators - Language barriers - Obtaining copyright approval for available training material - Political barriers - Data sharing restrictions

- Data sharing restrictions
- Time availability

DIP Notes: Impact on Aviation Safety in the Region:
This project would have a positive impact on aviation by avoiding accidents and incidents related to runway excursion.

RAST-PA/RE/09 Output 1

Description: ALTA will conduct a survey within its operators regarding the actions taken to mitigate unstable approaches.

Resources:

Resource Notes: ALTA members

Time Line: SCA + 6 months

Actions: The information obtained will be presented and be used to prepare the content for the safety seminars.
The goal will be to identify needs and share best practices to improve training methods.

Target Completion Date:

RAST-PA/RE/09 Output 2

Description: Develop a strategy to deliver safety seminars for pilots and controllers in Pan America that targets recognition and avoidance of unstable approaches.

Resources:

Resource Notes: Stakeholders as listed above

Time Line: Output 1 + 24 months

Actions: Develop a strategy and timeline to deliver safety seminars for pilots and controllers.

At a minimum the following topics should be covered:
- Stabilized Approaches
- Go Around Gates and Missed Approach Criteria
- Approach Procedures and Briefings
- Non Normal Aircraft Conditions
- Transfer of Aircraft Control
- CRM/TRM and human factors
- Weather conditions and information dissemination including tail wind landings

During the safety seminars participant will be asked to provide additional mitigation measures that will be compiled and used as the basis of future safety enhancements for runway exercusions.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/RE/11	Develop guidance material and training programs to create action plans for runway safety teams.	Annex 14, ICAO Doc. 9137, IATA, FAA, IFALPA Airport Liaison Program	9	High	Easy	P1	1	Short

Safety Enhancement Action (expanded):	To reduce runway related accidents and incidents at airports by identifying airport specific hazards and developing mitigations.
Statement of Work:	Establish the framework to create Runway Safety Teams (RST) which will evaluate airports for hazards and implement the appropriate mitigations. Facilitate the sharing of data, training material, mitigations, and workshops.
Champion Organization:	Mexico
Human Resource:	CAAs, ICAO, Airport Operators, Air Operators, Air Traffic Management/Communication Navigation Surveillance providers, Fixed Base Operators, Pilots.
Financial Resource:	Database creation, workshops, RASG-PA resources for material compilation.
Relation Current Aviation Community Initiative:	ICAO Global and Regional Runway Safety Initiative, Flight Safety Foundation Runway Safety Initiative, Commercial Aviation Safety Team Safety Enhancement Material currently available: - ICAO (http://www2.icao.int/en/RunwaySafety/Pages/Toolkits.aspx) - Flight Safety Foundation (http://flightsafety.org/current-safety-initiatives/runway-safety-initiative-rsi) - Federal Aviation Administration (http://www.faa.gov/airports/runway_safety/resources/lrsat/) - EUROCONTROL (http://www.eurocontrol.int/runwaysafety/public/standard_page/keyActions.html) - IFALPA (http://ifalpa.org/ifalpa-training/alr/alr.html)
Performance Goal Indicators:	Goal 1: Establish a runway safety team (RST) at the busiest airport of each contracting State in the Pan American region in terms of operations per year. Indicator: Twelve teams established per year. Goal 2: Establish a RST at all international airports of each contracting State in the Pan American region. Indicator: Twelve teams established per year. Goal 3: Reduce the occurrence of runway related incidents and accidents. Indicator: A measurable reduction in runway related incidents and accidents.

Key Milestones:

DIP		ESC X Approval
Output 1	Gather & Publish information	ESC 10 Date + 3
Output 2	Checklist	Output 1 + 6
Output 3	Database	Output 1 + 6
Output 4	Roll out plan	Output 3 + 6
Output 5	Review and update	Output 4 + 6

Potential Blockers:

- Lack of resources to establish RSTs
- Differences between CAAs and airport operators
- Airport operators may not recognize safety enhancement benefits
- Data sharing
- Lack of resources to implement mitigations

DIP Notes: RASG-PA, Annual Safety Report Team (ASRT), will review collected data on a yearly basis. This data will be reflected in the annual RASG-PA Safety Report.

Multidisciplinary runway safety teams are envisaged to work with airport operators to identify areas of opportunity and available resources to enhance runway safety for specific aerodromes.

RAST-PA/RE/11 Output 1

Description: Gather and publish in the RASG-PA website available material that may be used to mitigate hazards related to runway safety.

Resources:

Resource Notes: ICAO

Time Line: 6 months

Actions: Publish or make links available to websites such as FSF, CAST, FAA, EURCONTROL and IFALPA which RST may use to proposed mitigation actions for identified hazards related to runway safety.

Target Completion Date:

RAST-PA/RE/11 Output 2

Description: Electronic checklist development

Resources:

Resource Notes: ICAO, IFATCA, IATA & ACI

Time Line: 6 months

Actions: Develop an electronic checklist based on best practices and threat and error management that RST may use to identify hazards and propose mitigation actions. The checklists should address the following areas:

- ATM/CNS
- Air operators
- Airport
- Before releasing final versions of the checklists, field test in a pilot project
- Translate Checklists into Spanish

Target Completion Date:

RAST-PA/RE/11 Output 3

Description: Establishment of a regional Runway Safety Database

Resources:

Resource Notes: ICAO

Time Line: 6 months

Actions: Create a Regional database that will house the data from the checklists (Output 2) with at least the following considerations:

- Option to de-identify the source of the information
- Where possible responses should be selectable (rather than free text)

- Where possible responses should be selectable (rather than free text)
- Contain appropriate level(s) of data entry
- Consider the legal aspects of data sharing
- Capture the resulting mitigation actions and their end result
- Before releasing final versions of the checklists/database interface, field test in a pilot project
- Spanish version

Target Completion Date:

RAST-PA/RE/11 Output 4

Description: Develop a roll out plan

Resources:

Resource Notes: RAST-PA / FSTT-PA

Time Line: 6 months

Actions: Organize workshops in Pan America to disseminate the information and train on:
- Establishment of RST
- The use of the DB
- The use of the checklist
- Finding Material related to runway safety.

Target Completion Date:

RAST-PA/RE/11 Output 5

Description: Review and Update of the Runway Safety Teams

Resources:

Resource Notes: RAST-PA

Time Line: 6 months

Actions: Develop a process to review on a two times a year basis the number of RSTs established and ensure that all relevant runway safety material is maintained updated.

Target Completion Date:

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/CFIT/02	Specific ALAR/CFIT Training for Pilots	SE-12, ALAR Toolkit, FSF CFIT Training	9	Medium	Moderate	P5	1	Short

Safety Enhancement Action (expanded):	Promote specific ALAR/CFIT prevention training and procedures to be included in operators approved training curriculums, emphasizing pilot situational awareness and escape procedures for flight crews to use in the event of a terrain warning indication.
Statement of Work:	Controlled Flight Into Terrain (CFIT) has been identified as one of the top three data driven risk areas in Pan-America. CFIT is a significant cause of commercial aviation equipment loss and fatalities, worldwide. CFIT accidents could be substantially reduced if all operators and training centers in Pan America developed CFIT prevention procedures and add them to their approved initial and recurrent training curriculums.
Champion Organization:	IATA
Human Resource:	CAA's, ICAO, IATA, ATA, ALTA and industry partners.
Financial Resource:	
Relation Current Aviation Community Initiative:	•RASG-PA has identified CFIT as the number two flight safety risk area in Pan America. •Flight Safety Foundation (FSF) has recently updated (April 2010) the ALAR Toolkit that includes CFIT Education and Training.
Performance Goal Indicators:	Goal 1: A reduction of 80% in ten years of CFIT accidents involving operators in Pan America. Indicator: Operator CFIT accident rate in Pan America is continuously reduced toward the goal. Goal 2: CFIT training and guidance material will be provided to all operators and training centers not conducting CFIT training. Indicator: All operators and training centers are conducting CFIT training. Goal 3: Post CFIT Education and Training Guidance Material on the RASG-PA Website. Indicator: CFIT training material posted on the RASG-PA Website prior to completion of Output 1.
Key Milestones:	•CAA's conduct a review of all operators CFIT training programs SCA + 6 months •CFIT Education and Training Guidance Material Available on the Web. SCA + 2 months •Operators and training centers will incorporate CFIT training into their training programs. SCA + 12 months
Potential Blockers:	•Availability of CAA resources.

•Operators may not recognize the safety enhancement benefits

DIP Notes:

RAST-PA/CFIT/02 Output 1

Description:	CAA's conduct a review of all operators to ascertain which operators have CFIT prevention training and procedures in their approved training programs.
Resources:	
Resource Notes:	CAA (Flight Safety Oversight Department) Estimate of 2 to 4 CAA man-hours per airline to complete operator review CAA Inspector review checklist
Time Line:	SCA+ 6 months
Actions:	Through the flight safety oversight departments, CAA's will direct inspectors to conduct a review of their operator and identify which operators provide CFIT prevention training and procedures within their approved training programs.
Target Completion Date:	

RAST-PA/CFIT/02 Output 2

Description:	If an operator does not have CFIT training, he will be encouraged to incorporate CFIT training into the airline training program.
Resources:	
Resource Notes:	Operators, CAA's and ICAO Variable cost depending on the operator and the number of pilots
Time Line:	SCA+ 16 months
Actions:	Operators will incorporate CFIT prevention training and procedures into their training programs.
Target Completion Date:	

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/CFIT/04	CRM/Situational Awareness for pilots and air traffic controllers (To include review of actual events when possible)	SE -11, SE-46, SE-47	12	Medium	Moderate	P5	2	Medium

Safety Enhancement Action (expanded):	Include specific CRM/situational awareness training and procedures to all pilots and air traffic controller training curriculums, emphasizing pilot and controller situational awareness with respect to CFIT.
Statement of Work:	Crew Resource Management/Controller Resource Management (CRM) training, situational awareness and CFIT prevention are closely linked. This project will reduce CFIT accidents by promoting comprehensive pilot and air traffic controller CRM training programs.
Champion Organization:	IFALPA/IFATCA
Human Resource:	CAA's, ICAO, ANSP's, IFALPA, IFATCA, IATA and industry partners.
Financial Resource:	
Relation Current Aviation Community Initiative:	•RASG-PA website (http://www.mexico.icao.int/RASGPA.html#TrainingRefs) •FSF virtual library (http://flightsafety.org/) •ALAR Briefing Note – Crew Resource Management (http://flightsafety.org/files/alar_bn2-2-crm.pdf) •Airbus (http://www.airbus.com/en/corporate/ethics/safety_lib/) •Boeing operators (www.myboeing.com)
Performance Goal Indicators:	Goal 1: A substantial reduction of CFIT accidents involving air transport operators in Pan America. Indicator: Operator CFIT accident rate in Pan America decreases by 80%. Goal 2: CRM/situational awareness training and guidance material provided to all air transport operators and Air Traffic Personnel. Indicator: Increase in number of operators and Air Traffic Personnel that are conducting CRM/situational awareness training. Goal 3: Post the CRM/situational awareness guidance material on the RASG-PA Website. Indicator: CRM/situational awareness guidance material posted on the RASG-PA Website by the time of SCA +2 months.
Key Milestones:	•CRM/situational awareness training and guidance material available on the Web. SCA +2 months •Operators will incorporate CFIT training into their training program. SCA +18 months •ANSP will incorporate CFIT training into their training program. SCA+ 24 months

Potential Blockers:	•Availability of CAA/ANSP/State resources. •Operators, States and ANSP may not recognize the safety benefits
DIP Notes:	All communications to States should be conducted through the RASG-PA Secretariat. Guidance on coordinating with ICAO and identifying which operators and ANSPs are providing CFIT prevention training and procedures within their approved training programs may be useful to States. *ATC training in this area has already been developed*

RAST-PA/CFIT/04 Output 1

Description:	Incorporate and/or update CRM/situational awareness training programs for all flight crew members of air transport operators emphasizing aircraft position with relation to terrain and reviewing past occurrences.
Resources:	
Resource Notes:	Air transport operators (training departments), Variable cost depending on the operation
Time Line:	SCA+ 18 months
Actions:	Reduce the CFIT accident rate by incorporating CFIT prevention in CRM training programs. Situational awareness will be emphasized as an integral part of the CRM training required of flight crewmembers of all air transport operators.
Target Completion Date:	

RAST-PA/CFIT/04 Output 2

Description:	Incorporate CRM/situational awareness training programs for all air traffic controllers of air navigation service providers (ANSP) emphasizing aircraft position with relation to minimum allowable altitudes.
Resources:	
Resource Notes:	ANSP's (training departments), CRM/situational awareness guidance material posted on the RASG-PA Website Variable cost depending on the ANSP
Time Line:	SCA+ 24 months
Actions:	Reduce the CFIT accident rate by incorporating CFIT prevention in CRM training programs. Situational awareness will be emphasized as an integral part of the CRM training required of air traffic controllers of all ANSPs.
Target Completion Date:	

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/LOC-I/06	LOC Training – Human factors and automation	SE 30	9	**High**	Moderate	P2	3	**Short**

Safety Enhancement Action (expanded):	To improve the overall performance of flight crews to recognize and prevent loss of control accidents, through effective use of automation.
Statement of Work:	To reduce loss of control accidents, operators will be encouraged to adopt consensus policies and procedures relating to mode awareness and energy state management aspects of flight deck automation, as appropriate to their respective operations.
Champion Organization:	RASG-PA (RAST-PA)
Human Resource:	IATA, Pilot Associations; Safety, Flight Operations and Training managers; ICAO, CAA's, aircraft manufacturers, training centers.
Financial Resource:	The total estimated cost would be X person-years.
Relation Current Aviation Community Initiative:	The following are some of the activities related to this project: •Incident data has shown that flight deck automation is a core issue that needs to be addressed. To enhance safety, a CAST working group, including aircraft manufactures, pilot associations, etc. developed a tactical approach and distributed policies and procedures relating to mode awareness and energy state management. The COSCAP's in Asia used this material to develop a generic advisory circular. •CAST Flight Deck Automation Working Group has been formed to recommend and prioritize actions to address, for current and projected operational use, the safety and efficiency of modern flight deck systems for flight path management (including energy state management). •The Human Factors and Pilot Training Group of the ALPA, Air Safety Structure has identified its position regarding CRM and Human Factors with respect to the use of automation. •SAE G10, Aerospace Behavioral Engineering Technology (ABET) Committee, deals with the philosophies, principles and criteria by which designers, engineers, pilots and behavioral scientists structure systems to achieve maximum human workload compatibility for automation efficiency. The committee has several subcommittees with on-going work into human factors and automation
Performance Goal Indicators:	Goal 1: Mitigate the effects of mode confusion and energy state management as contributing factors in loss of control accidents. Indicator: A measurable reduction of loss of control incidents and accidents related to automation.

Goal 2: Mode awareness and energy state management aspects of flight deck automation advisory circular is readily available.
Indicator: Each ICAO contracting State in the region has issued an advisory circular and distributed it to each operator's in the State. Completion of Output 3.

Goal 3: All operators incorporate mode awareness and energy state management aspects of flight deck automation guidance in their approved training programs.
Indicator: Mode awareness and energy state management aspects of flight deck automation guidance is provided to all transport airplane pilots Completion of Output 4.

Key Milestones:

The following milestones are based on the date of Steering Committee Approval (SCA) (months):
•Review Asian advisory circular IATA SCA+6
•Issue generic advisory circular ICAO Output 1 +1
•Issuance of advisory circular by States in the Region. CAAs Output 2 +6
•Operators develop guidance based on the AC and train pilots. Operators Output 3 + 18
•Track Implementation RASG-PA SCA +12 and yearly

Potential Blockers:

•Operator might not embrace advisory circular material,
•Operators might not accept the potential cost of this training,
•Operators may not recognize the safety enhancement benefits,
•States may opt not to adopt and issue the advisory circular.

DIP Notes:

To reduce loss of control accidents, air carriers will be encouraged to adopt consensus policies and procedures relating to mode awareness and energy state management, as appropriate to their respective operations.

RAST-PA/LOC-I/06 Output 1

Description:

Review and evaluate the advisory circular created by the ICAO COSCAP's in Asia

•ALTA / IFALPA / IATA team to review and evaluate the advisory circular created by the ICAO COSCAP's in Asia related to mode awareness and energy state management of flight deck automation.
•Based on this review create a generic advisory circular for the Region

Resources:

Resource Notes:

ALTA, IFALPA, IATA, Pilot Associations, Flight Operations, Safety and Training managers, and Aircraft Manufacturers. The estimated cost of a one day meeting of the appropriate persons.

Time Line:

SCA + 6 months

Actions:

ALTA / IFALPA / IATA will convene a team to analyze the advisory circular, to verify policies and procedures related to mode awareness and energy state management are appropriate for the Region. The team will develop a generic mode awareness and energy state management aspects of flight deck automation advisory circular for Pan America.

Target Completion Date:

RAST-PA/LOC-I/06 Output 2

Description:

•ICAO will distribute a copy of the developed generic advisory circular to each State in the Region.

Resources:

Resource Notes:

ICAO

Time Line:

Completion of Output 1 + 1 months

Actions:

ICAO Regional Offices will prepare a cover letter and disseminate the generic advisory circular to each member State in the Region.

Target Completion Date:

RAST-PA/LOC-I/06 Output 3

Description:

•Each State in the region will use the generic advisory circular as a template to prepare a State advisory circular on mode awareness and energy state management aspects of flight deck automation.

Resources:

Resource Notes:

State regulatory authorities

Time Line:	Completion of output 2 + 9 months
Actions:	States in the Region to issue their own advisory circular on mode awareness and energy state management aspects of flight deck automation.
Target Completion Date:	

RAST-PA/LOC-I/06 Output 4

Description:	Mode awareness and energy state management aspects of flight deck automation guidance is provided by operators to all of their pilots.
Resources:	
Resource Notes:	Operator's flight operations, standards and training departments.
Time Line:	Completion of Output 3 + 18 months
Actions:	Each operator should carefully developed procedures and guidelines that support the proper use of mode awareness and energy state management aspects of flight deck automation in their training programs. Each transport airplane pilot should be trained to the flight deck automation procedures and guidelines developed by their organization.
Target Completion Date:	

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/LOC-I/07	LOC Training – Advanced maneuvers	SE 31	9	High	Moderate	P2	1	Short

Safety Enhancement Action (expanded):	Promote LOC Training – Advanced maneuvers Pilots will be better trained to avoid and recover from excursions from normal flight and loss of control.
Statement of Work:	Advanced Maneuvers Training (AMT) focuses on training to prevent and recover from hazardous flight conditions outside of the normal flight envelope, such as, inflight upsets, stalls, ground proximity and wind shear escape maneuvers, and inappropriate energy state management conditions. There has been a recent increase in accidents where loss of control was a contributing factor. The purpose of this project is to collect and provide advanced maneuver training material and to encourage operators to use these materials to implement advanced maneuver ground training and flight training using appropriate flight training equipment. Emphasis should be given to stall onset recognition and recovery, unusual attitudes, upset recoveries, effects of icing, energy awareness and management, and causal factors that can lead to loss of control
Champion Organization:	ALTA
Human Resource:	Airline Associations, Pilot Associations; Safety, Flight Operations, and Training managers, aircraft manufacturers, ICAO, flight simulation device manufacturers, training centers, existing training aids, and new materials developed by manufacturers.
Financial Resource:	The total cost associated with this project would be determined by the number of crew personnel that need to be trained and the amount of training time required. This initiative is considered essential for flight safety, there would be no cost associated with the devel
Relation Current Aviation Community Initiative:	•Voluntary training currently being done – both ground and flight •Wind shear training required since 1988 •Airplane Upset Recovery Training Aid •Commercial training products becoming available
Performance Goal Indicators:	Goal 1: Develop and make available AMT material for operators approved training programs Indicator: Availability of the AMT material within 8 months of SCA. Goal 2: All operators incorporate AMT in their approved training programs. Indicator: Operators incorporate AMT material within 36 months of SCA. Goal 3: Reduce occurrence of LOC accidents.

Indicator: A measurable reduction of loss of control incidents and accidents related to excursion from normal flight.

Key Milestones: The following milestones are based on the date of Steering Committee Approval (SCA) (months):
- Distribute currently available Training Aids ALTA SCA +8
- Track adoption of AMT ALTA SCA +8
- Track Implementation SCA+8 and on a yearly basis

Potential Blockers:
- Some special interests might discredit AMT simulator training
- Operators might ignore AMT materials
- Operators might not accept the potential cost of this training
- Operators may not recognize the safety enhancement benefits

DIP Notes:

Advanced Maneuvers Training (AMT) refers to training to prevent and recover from hazardous flight conditions outside of the normal flight envelope. Examples include in-flight upsets, stalls, ground proximity and wind shear escape maneuvers, and inappropriate energy state management conditions. This safety enhancement collects and provides advanced maneuver training material and encourages operators to use these materials to implement advanced maneuver ground and flight training using appropriate flight training equipment. Emphasis should be given to stall onset recognition and recovery, unusual attitudes, upset recoveries, effects of icing, energy awareness and management, and causal factors that can lead to loss of control.

RAST-PA/LOC-I/07 Output 1

Description: Listing of training materials available from regulators, industry, operators, academia and other resources.

Resources:

Resource Notes: RAST-PA Secretariat (NACC office) will produce a comprehensive list, with input from all RAST-PA members.
All aircraft manufacturers should provide a list of available training materials and aids.
FAA Airplane Upset Recovery Training Aid: is available on its public web site.

Time Line: SCA+ 5 months

Actions: RAST-PA should distribute the Airplane Upset Recovery Training Aid to all appropriate regional stakeholders.

Target Completion Date:

RAST-PA/LOC-I/07 Output 2

Description: Advanced Maneuvers Training provided to all operators.

Resources: 10000

Resource Notes: Estimated distribution costs in USD.
ALTA, IATA

Time Line: Output 1 Complete + 3 months

Actions: ALTA should provide the training materials to each operator in the region. IATA should support ALTA's initiative. ALTA should report the level of commitment by the operator's flight operations and training departments.

Target Completion Date:

RAST-PA/LOC-I/07 Output 3

Description: Advanced Maneuvers Training provided by all operators. The expectation is that this training will be accomplished during initial training and as part of the recurrent training program, via ground and simulator instruction within the certified flight envelope, with emphasis on recognition, prevention and recovery techniques.

Resources:

Resource Notes: Costs may vary from operator to operator and would need to consider;
1) Revising the training program for AMT.
2) Assessing the simulator time allotted on the initial and recurrent syllabuses to accommodate AMT.
3) It is estimated that AMT training would require 30 minutes or less of simulator time.

Time Line: Output 2 Complete + 28 months

Actions:	ALTA and IATA should promote a high level of commitment to advanced maneuvers training (AMT) by operator flight operations and training departments. Advanced maneuvers training will be conducted emphasizing energy state management and early recognition and recovery from flight outside the certified aircraft-operating envelope.Flight conditions outside of the certified flight envelope include inflight upsets, stalls, ground proximity and wind shear escape maneuvers, and inappropriate energy state management conditions. The training will be accomplished via ground and simulator instruction within the certified flight envelope, with emphasis on recognition, prevention and recovery techniques. The simulator instruction will be within the limitation of the training device being utilized.
Target Completion Date:	

Rast No	Safety Enhancement Action	Reference	GSI	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-PA/LOC-I/09	LOC Training – Pilot monitoring policies and procedure for the operator and training program for crews.		9	High	Easy	P1	2	Short

Safety Enhancement Action (expanded): Promote Pilot Monitoring Techniques and Training. Monitoring performance can be significantly improved by training these skills

Statement of Work: The purpose of this project is to collect and provide pilot monitoring training material and to encourage operators to use these materials to implement pilot monitoring training and flight procedures.

Inadequate flight crew monitoring has been cited by a number of sources as a problem for aviation safety. A collaborative research effort by NASA-Ames, 21 worldwide airlines and the University of Texas Human Factors Research Program, which observed more than 2,000 airline flights, noted that roughly 62 percent of unintentional errors went undetected by flight crews. In addition, the Flight Safety Foundation, ALAR working group, has established that poor monitoring has been a factor in 63 percent of approach and landing accidents. ICAO has also determined that 50 percent of CFIT accidents had pilot monitoring as a common factor.

The term 'Pilot Monitoring' (PM) should be used as an alternative to 'Pilot Not Flying' (PNF) since it reflects clearly the most important function of a PNF.

Conventionally, when two pilots fly a fixed-wing airplane the aircraft commander occupies the left hand seat, and the co-pilot or first officer occupies the right hand seat. Before the commencement of each flight leg, the aircraft commander decides which pilot will take direct responsibility for flying the aircraft and they become 'Pilot Flying' (PF) for that leg. The other pilot is then 'Pilot Not Flying' (PNF) and carries out supporting duties such as communications and check-list reading. Currently some operators use alternative terms for PF and PNF.

Several major airlines have recently revised their procedures to maximize the monitoring of aircraft trajectory, automation and systems. They have tried to minimize or eliminate concurrent procedures that conflict with crew monitoring.

Champion Organization: IFALPA

Human Resource: Pilot Associations, IATA, ALTA, ICAO, Flight Operations, and Training managers, training centers, existing training aids.

The total cost associated with this project would be determined by the number of flight crews that need to be trained and the amount of time required. This initiative is considered essential for flight safety.

Estimated 2 meetings of RAST representatives to implement Output 1.

Financial Resource:

Relation Current Aviation Community Initiative:
- Aligns with major findings by ICAO, FSF, NTSB.
- Aligns with components of CRM

Performance Goal Indicators:
Goal 1:Reduce occurrence of LOC accidents.
Indicator: A measurable reduction of loss of control incidents and accidents related to deviations from normal flight.

Goal 2: Pilot Monitoring Training material is readily available.
Indicator: Availability of the Pilot Monitoring Training material in each operator's organization within 2 months of Output 3.

Goal 3: All operators incorporate Pilot Monitoring Training in their approved training programs.
Indicator: Pilot Monitoring Training is provided to all transport airplane pilots. Within 18 months of Output 4.

Key Milestones:
The following milestones are based on the date of Steering Committee Approval (SCA) (months):
- Distribute currently available Training Aids ALTA SCA+5
- Track adoption of Pilot Monitoring Training ALTA SCA+12

Potential Blockers:
- Operators might not accept the potential cost of this training
- Operators may not recognize the safety enhancement benefits

DIP Notes:

Pilot Monitoring policies and procedure for the operator and training program for crews.

RAST-PA/LOC-I/09 Output 1

Description:
- Listing of training materials available from industry, operators, and other resources.

Resources:

Resource Notes: RASG-PA Secretariat (NACC office) will produce a comprehensive list.

Time Line: SCA + 5 months

Actions: RASG-PA should distribute the Pilot Monitoring Training Aid to all appropriate regional stakeholders (IATA, ALTA, CAA, etc.).

Target Completion Date:

RAST-PA/LOC-I/09 Output 2

Description:
- Raise awareness of availability and need of Pilot Monitoring Training.

Resources:

Resource Notes: IFALPA, Local Pilot Associations

Time Line: Completion of Output 1 + 1 months

Actions: IFALPA, ALTA and local pilot associations should market and promote ongoing activities that develop a higher level of commitment to Pilot Monitoring Training by operator's flight operations, standards and training departments.

Target Completion Date:

RAST-PA/LOC-I/09 Output 3

Description:
- Pilot Monitoring Training material provided to all operators.

Resources:

Resource Notes: ALTA, IATA, CAA's

Time Line: Completion of Output 1 + 2 months

Actions: ALTA should provide the training materials to each operator in the region. IATA should support ALTA's initiative. ALTA should report to RASG-PA the level of commitment by the operator's flight operations and training departments.

Target Completion Date:

RAST-PA/LOC-I/09 Output 4

Description:	•Pilot Monitoring Training provided by operators to all of their pilots.
Resources:	
Resource Notes:	Operator's flight operations, standards and training departments, pilot associations.
Time Line:	Completion of Output 3 + 18 months
Actions:	Each operator should carefully developed procedures and guidelines that support pilot monitoring in their training programs. Each transport airplane pilot should be trained to the Pilot Monitoring procedures and guidelines developed by their organization.
Target Completion Date:	