International Civil Aviation Organization
Regional Aviation Safety Group - Pan America (RASG-PA)

WORKING PAPER

RASG-PA/9 — WP/16
16/06/16

Ninth Regional Aviation Safety Group — Pan America Plenary Meeting (RASG-PA/9)
Panama City, Panama, 23 June 2016

Agenda Item 4: **Pan America – Regional Aviation Safety Team (PA-RAST) Report**

PA-RAST STATUS REPORT

(Presented by Brazil and IATA)

EXECUTIVE SUMMARY

This paper presents an overview of the mitigation strategies developed by the Pan American Regional Safety Team (PA-RAST) since its establishment in 2008. Also, the current work plan and the Fatality Risk numbers for LATAM/CAR Region between 2010 and 2015 are presented.

PA-RAST is focused on the establishment of achievable projects based on prioritized mitigation measures with well-defined deliverables in a specific timeframe.

Action:	Suggested action is presented in Section 7.
Strategic Objective:	• Safety

1. Introduction

1.1 RASG-PA's Mission is defined as: "To reduce fatality risk in commercial aviation by ensuring prioritization, coordination and implementation of data driven safety enhancement initiatives in the Pan-American Region through the active involvement of all civil aviation stakeholders."

1.2 Fatality Risk is a measure of the exposure of a passenger or crew to a catastrophic accident where all people aboard perished. The equation to calculate the Fatality Risk is **Q = V/N**, where:

- **N** is the number of flights or sectors conducted during the period;
- **V** is the sum of all "full-loss equivalents" calculated for all N flights. A full-loss equivalent for a given flight is the proportion of passengers and crew that do not survive the accident.

1.3 RASG-PA has defined its objective as: "Using 2010 as a baseline, reduce Fatality Risk for Part 121 or equivalent operations by 50% by the year 2020 in Latin America and the Caribbean."

2. Detailed Implementation Plans (DIPs) 2008-2014

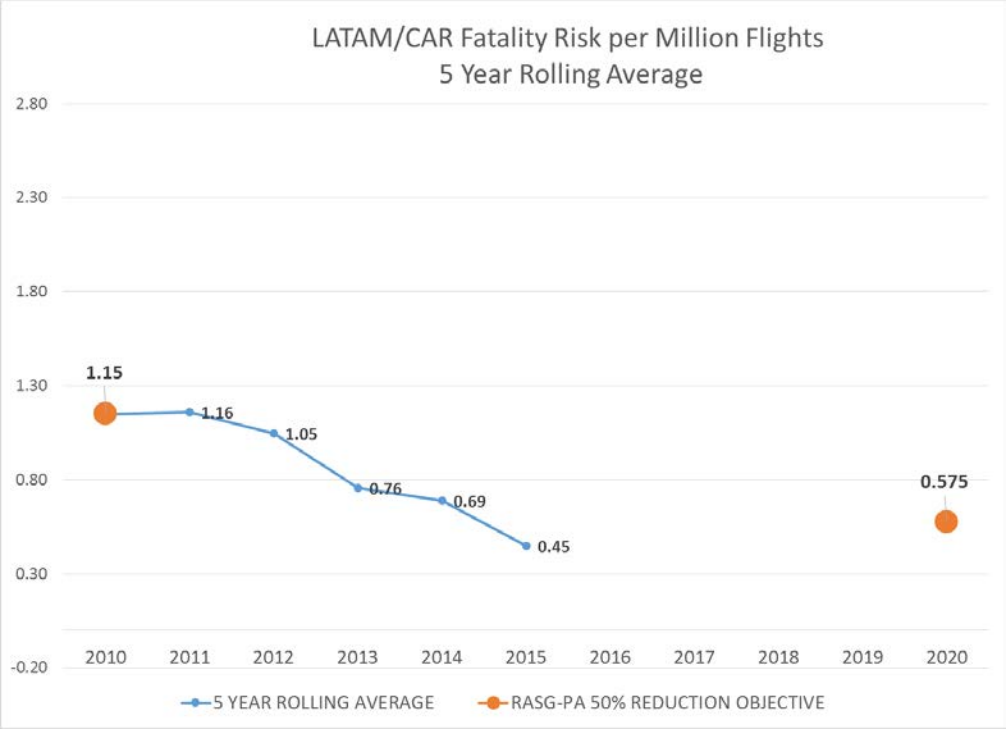
2.1 Between 2008 and 2014 there were developed 9 DIPs: 2 related to CFIT, 4 to RE and 3 to LOC-I. From the 9 DIPs developed, there are 27 associated outputs.

3. New Detailed Implementation Plans

3.1 There are 10 new DIPs being developed: 1 related to CFIT, 4 to RE, 5 to LOC-I (1 completed). Additional DIPs are expected to be developed by the recently established Mid-Air Collision Team.

4. Fatality Risk Status in The Region LATAM/CAR

4.1 The Fatality Risk curve in a 5-year rolling average criteria for the Region LATAM/CAR confirms a downtrend in the 2010-2015 period. The value associated to 2015 (0.45) is located below the Fatality Risk pursued for 2020 (0.575):



5. Accident and Incident Trends

5.1 Loss of Control In Flight (LOC-I): In the period from 2005 to 2014 it is verified a downtrend on the total occurrences distribution per year.

5.2 Controlled Flight Into Terrain (CFIT): In the period from 2005 to 2014 it is verified a downtrend on the total occurrences distribution per year. During 2013 and 2014 it is verified a slight uptrend on GPWS rates.

5.3 Mid-Air Collision (MAC): During 2013 and 2014 there is a substantial monthly variation in the number of TCAS RA events, and the numbers until December 2014 show a slight downtrend. However, available LHD events distribution between 2005 and 2014 show a constant uptrend.

5.4 Runway Excursion (RE): In the period from 2005 to 2014 it is verified a downtrend on the total RE occurrences distribution per year. Data from 2013 and 2014 also shows a downtrend on unstable approach rates.

6. Conclusions

6.1 DIPs developed between 2008 and 2014 contributed to lower the Fatality Risk numbers in the Region, which currently supersede RASG-PA's safety objective defined for 2020. However, an additional effort is still needed to consolidate this result over the next 4 years.

6.2 The continuous decrease and control of Fatality Risk numbers rely on the implementation, at a national level, of available DIPs by the States and Industry. State/Industry Safety Groups like BCAST in Brazil, and PASO in Costa Rica, are essential to achieve this goal. PA-RAST will keep working to support them and foster the creation of similar ones in other States.

6.3 The development and implementation of the additional mitigation strategies by PA-RAST, through the creation of new Detailed Implementation Plans, in the four areas: CFIT, LOC-I, RE and MAC, will ensure the 2020 fatality risk objective is met.

7. Suggested Action

7.1 The RASG-PA/9 Meeting is invited to:

a) Note the information provided in this WP;

b) invite States and Industry stakeholders to actively participate on PA-RAST and provide any additional resources to maintain the Fatality Risk low in the Region; and

c) invite States to support the creation and/or continuity of local safety groups to drive the continuous implementation of Safety Enhancement Initiatives in a National level.

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PA-RAST

Status Report

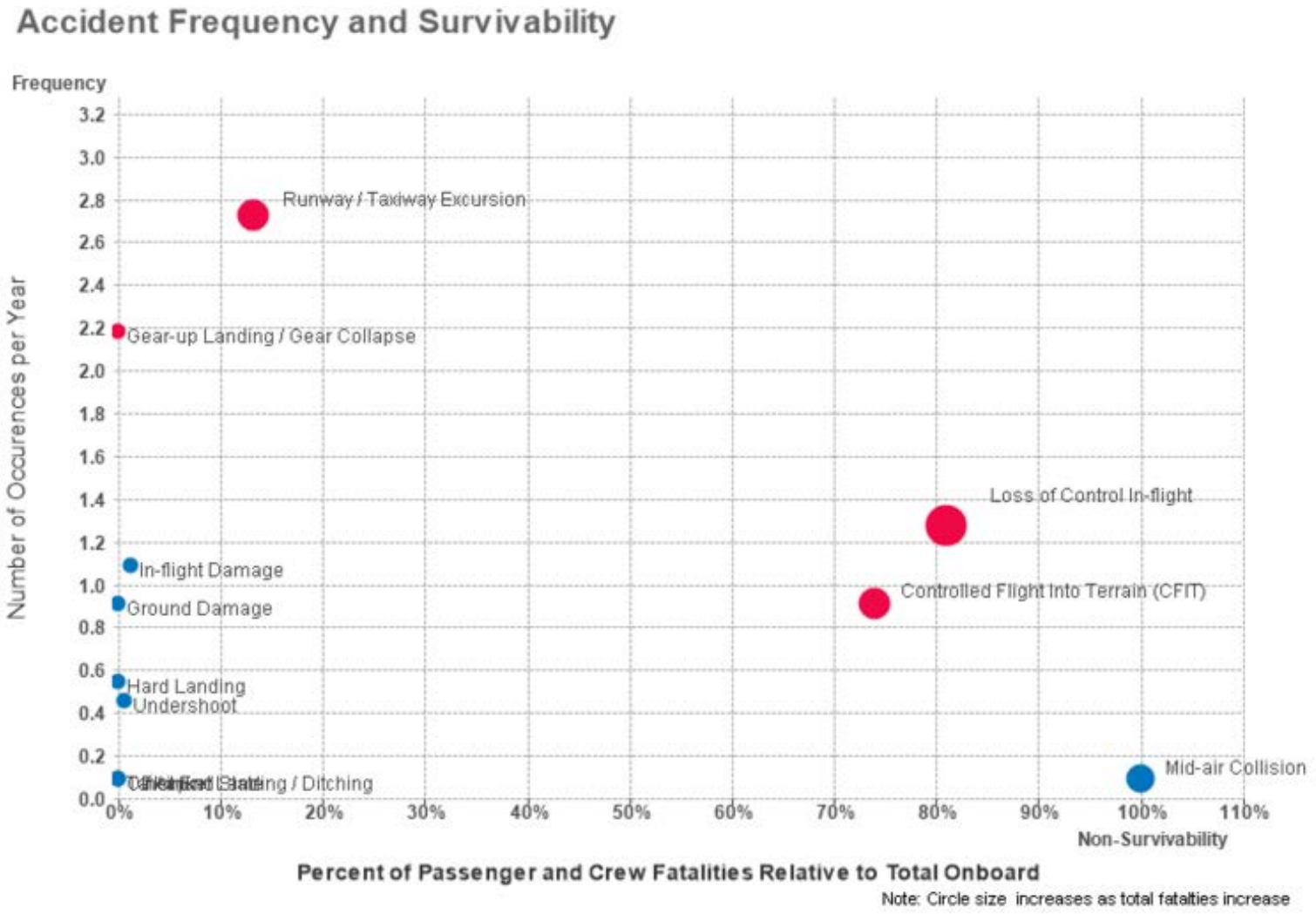
Presented by the Co-Chairs
Adriano Monteiro, Brazil
Gabriel Acosta, IATA

RASG-PA Objective

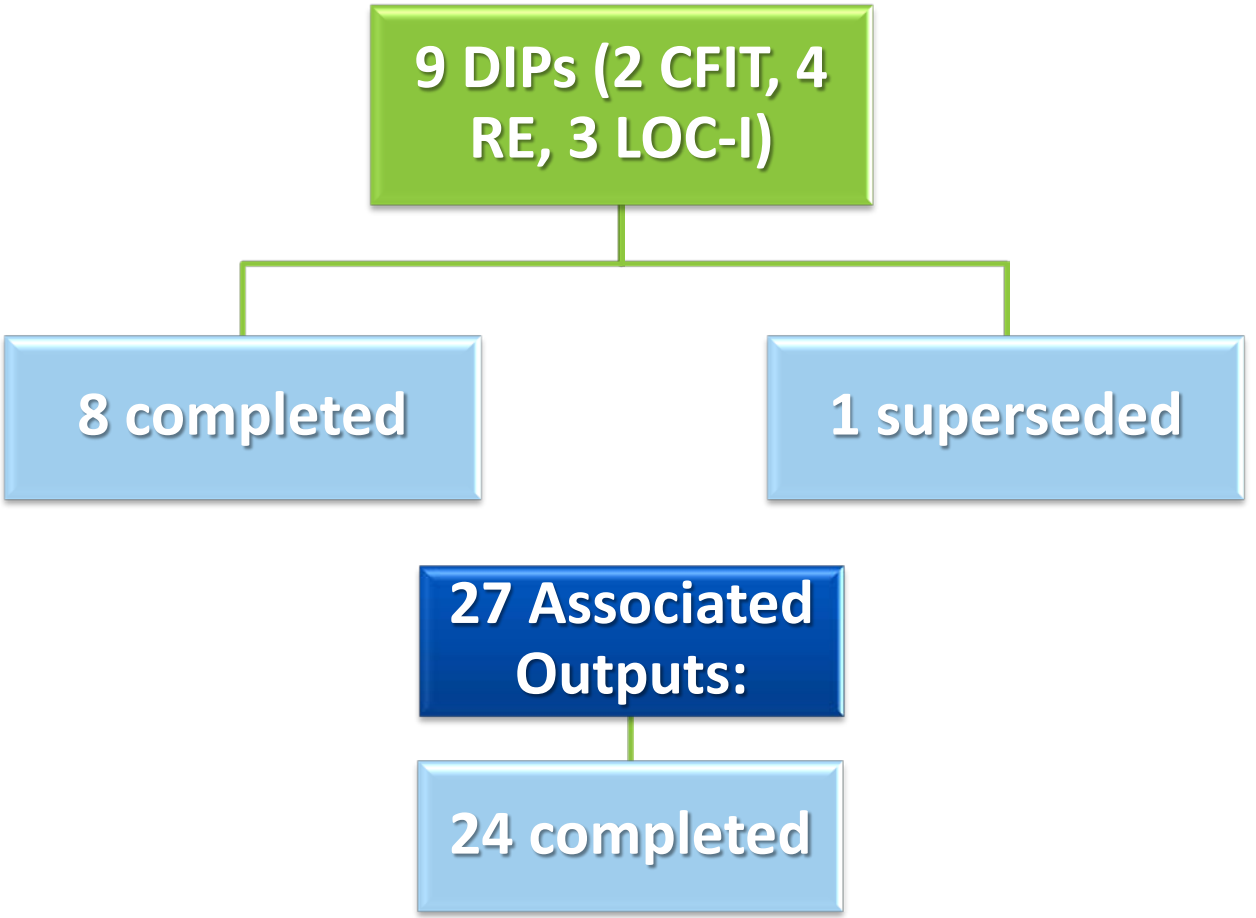
Reduce fatality risk for part 121 operators by 50% by 2020 based on 2010 numbers

- In the LATAM/CAR Region
- Using a 5 year rolling average
- Objective set in 2012 by RASG-PA ESC

Safety Trends
LATAM/CAR 2005-2015



2008-2014 Detailed Implementation Plans (DIPs)



2008-2014 Summary of Outputs

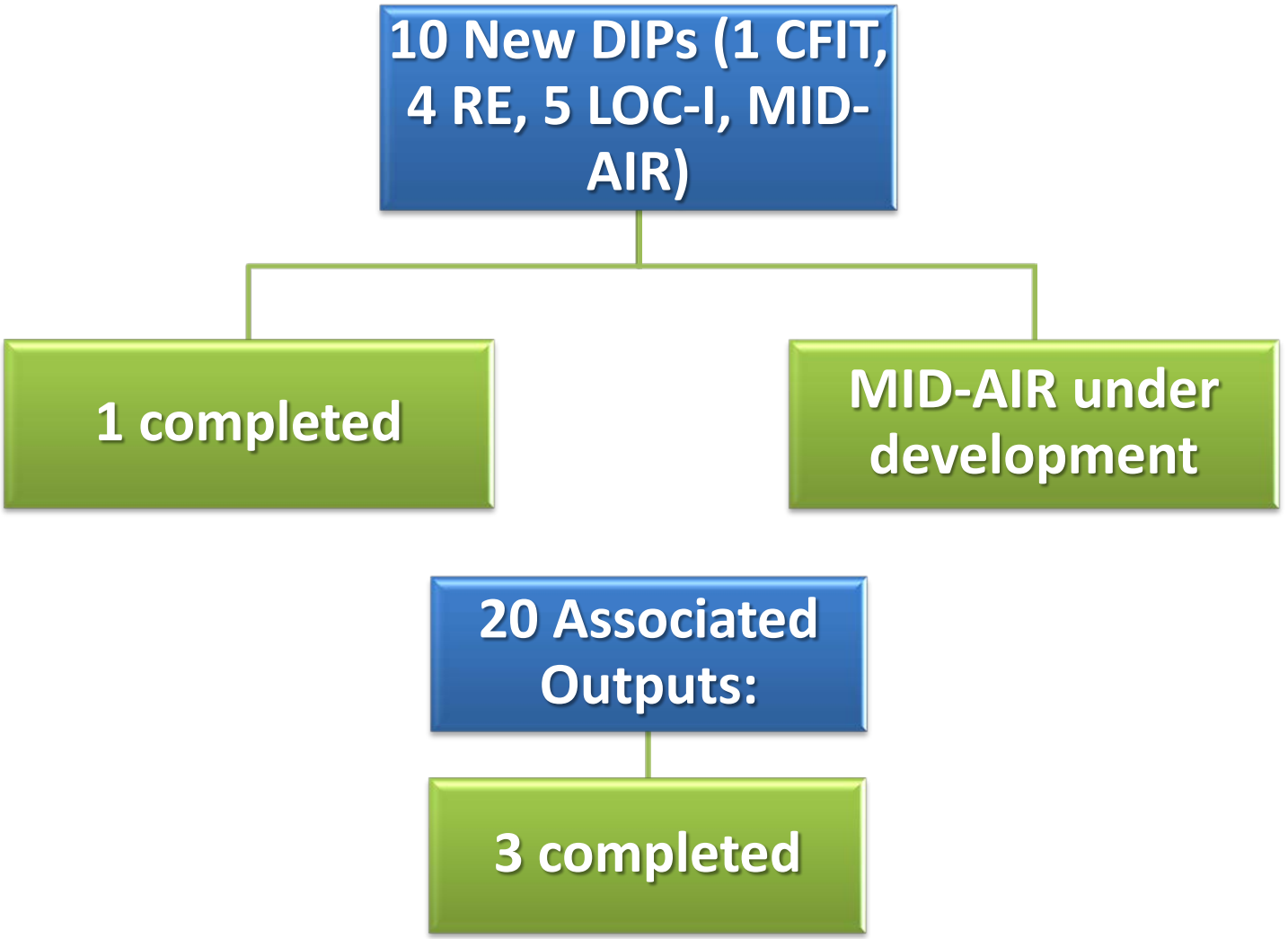
- Distributed RERR Toolkit version 2 to operators and states
- Conducted surveys on go-around policies and unstable approach mitigation
- Provided advanced maneuvers manual to all operators
- Developed RASG-PA Aviation Safety Workshops (3 delivered, 4 more planned) average participation 100
- Developed and delivered Pilot Monitoring Toolkit through safety workshops
- Developed first draft of guidance for Runway Maintenance IAW Annex 14
- Compiled and published aviation training material available on RASG-PA website (www.RASG-PA.org)
- Standardized CFIT training across operators in the region
- Developed RASG-PA Safety Recommendation (RSR) process
- Developed and submitted for dissemination a RSR on Mode Awareness and Energy State Management Risks
- Implemented the Runway Safety Team in Mexico City, Mexico

2014-Current Work

Safety Enhancement Teams
(7 Step Process)

1. Review and analysis of accident risk
2. Review of applicable safety enhancements
3. Start preparing DIPs
4. Review DIPs with PA-RAST
5. Present DIPs to ESC for information
6. Coordinate DIP Implementation at PA-RAST
7. Monitor progress

2014-Current Work



2014-Current Work - Summary of Outputs

- Worked with B737 fleet (World-wide) to survey and promote the adoption of a Service Bulletin on “Low Airspeed Alerting” to prevent LOC-I events
- Survey airlines (World-wide) on the use of EGPWS devices
- Making changes in IATAs IOSA Standards to ensure EGPWS systems and databases are kept up to date

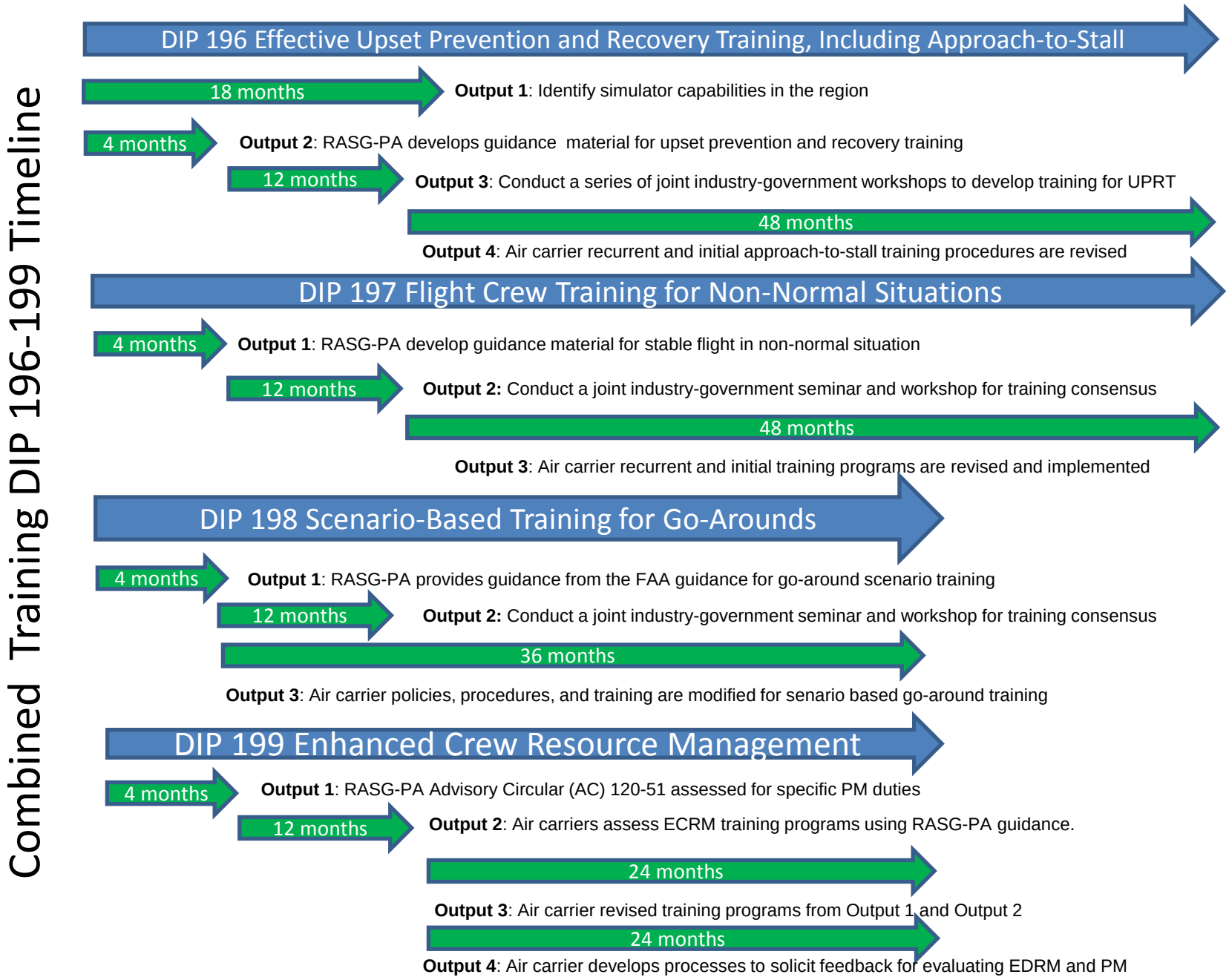
The LOC-I SET TEAM

Champion: FAA

LOC-I Design DIP
Work Timeline

Output 1: IATA/ALTA will identify availability of manufacture service bulletins by fleet

Output 2: Air carriers implement existing manufacturer service bulletins, installing low airspeed alerting functionality in their existing airplanes (as practical and feasible)


Combined Training DIP 196-199 Timeline
DIP 196 Effective Upset Prevention and Recovery Training, Including Approach-to-Stall
18 months
Output 1: Identify simulator capabilities in the region
4 months
Output 2: RASG-PA develops guidance material for upset prevention and recovery training
12 months
Output 3: Conduct a series of joint industry-government workshops to develop training for UPRT
48 months
Output 4: Air carrier recurrent and initial approach-to-stall training procedures are revised
DIP 197 Flight Crew Training for Non-Normal Situations
4 months
Output 1: RASG-PA develop guidance material for stable flight in non-normal situation
12 months
Output 2: Conduct a joint industry-government seminar and workshop for training consensus
48 months
Output 3: Air carrier recurrent and initial training programs are revised and implemented
DIP 198 Scenario-Based Training for Go-Arounds
4 months
Output 1: RASG-PA provides guidance from the FAA guidance for go-around scenario training
12 months
Output 2: Conduct a joint industry-government seminar and workshop for training consensus
36 months
Output 3: Air carrier policies, procedures, and training are modified for senario based go-around training
DIP 199 Enhanced Crew Resource Management
4 months
Output 1: RASG-PA Advisory Circular (AC) 120-51 assessed for specific PM duties
12 months
Output 2: Air carriers assess ECRM training programs using RASG-PA guidance.
24 months
Output 3: Air carrier revised training programs from Output 1 and Output 2
24 months
Output 4: Air carrier develops processes to solicit feedback for evaluating EDRM and PM

The CFIT SET TEAM

Champion: IATA

Safety Enhancements Recommended by SET 2 CFIT

CFIT fatality risk reduction strategy:

1) Survey airlines/operators to measure use of GPS/GPWS in LATAM/CAR Survey states to know if EGWPS is a regulatory requirement.

2) Work with Airline Maintenance to improve procedures that ensure GPWS always has the latest software version possible, and their terrain database is up to date.

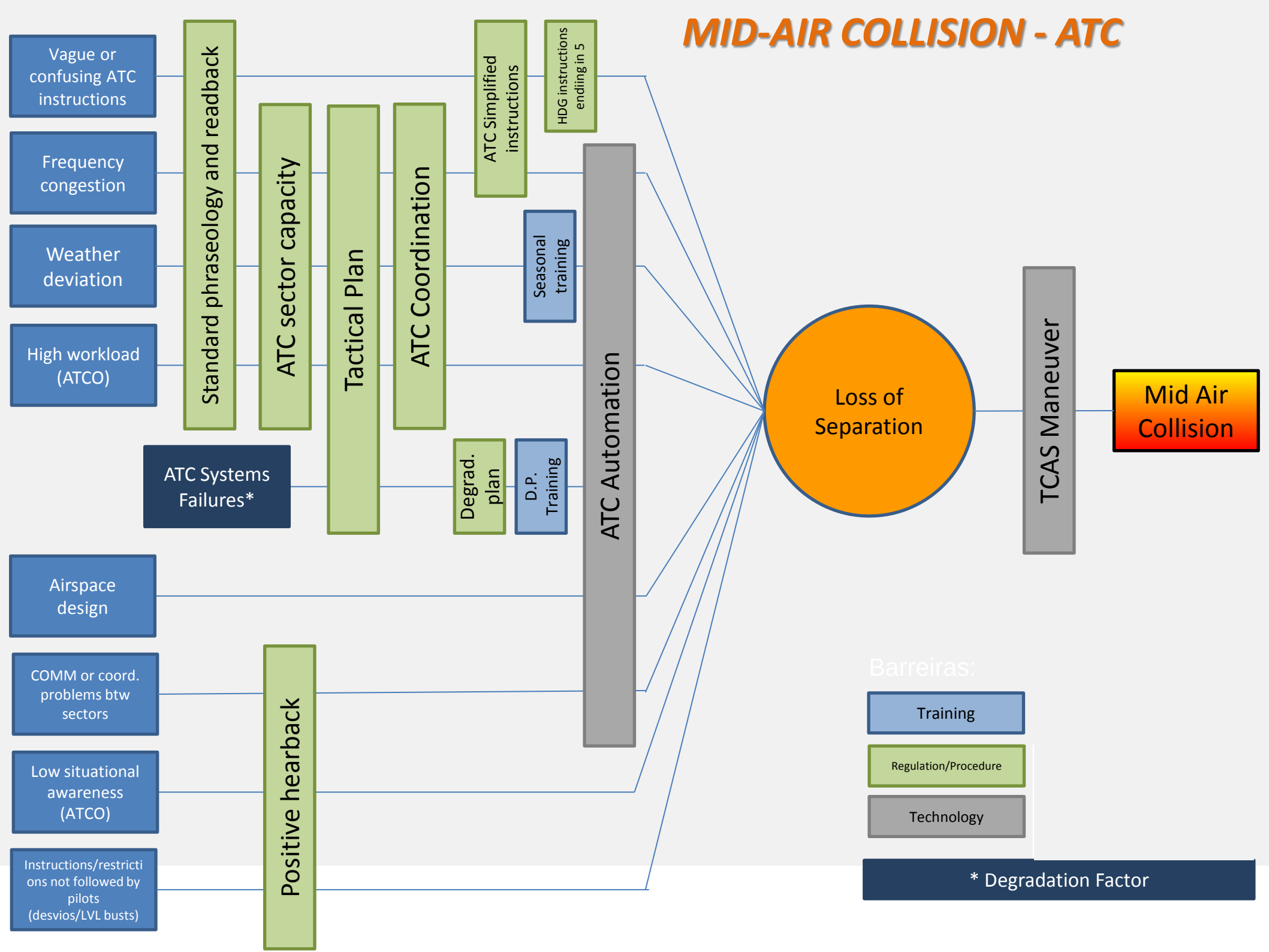
3) Develop a Support Material to help airlines in acquiring new planes with GPS/EGPWS

4) Promote adoption by airlines of SOPs that ensure “terrain display” is selected by at least one pilot at identified high CFIT risk airports.

The MAC SET TEAM

Champion: ANAC Brazil

BCAST MAC Working Group


MID-AIR COLLISION - ATC
Vague or confusing ATC instructions
Frequency congestion
Weather deviation
High workload (ATCO)
ATC Systems Failures*
Airspace design
COMM or coord. problems btw sectors
Low situational awareness (ATCO)
Instructions/restrictions not followed by pilots (desvios/LVL busts)
Standard phraseology and readback
ATC sector capacity
Tactical Plan
ATC Coordination
Positive hearback
ATC Simplified instructions
HDG instructions endiing in 5
Seasonal training
Degrad. plan
D.P. Training
ATC Automation
Loss of Separation
TCAS Maneuver
Mid Air Collision
Barreiras:
Training
Regulation/Procedure
Technology
* Degradation Factor

NEW MAC SET

Championed by Brazil

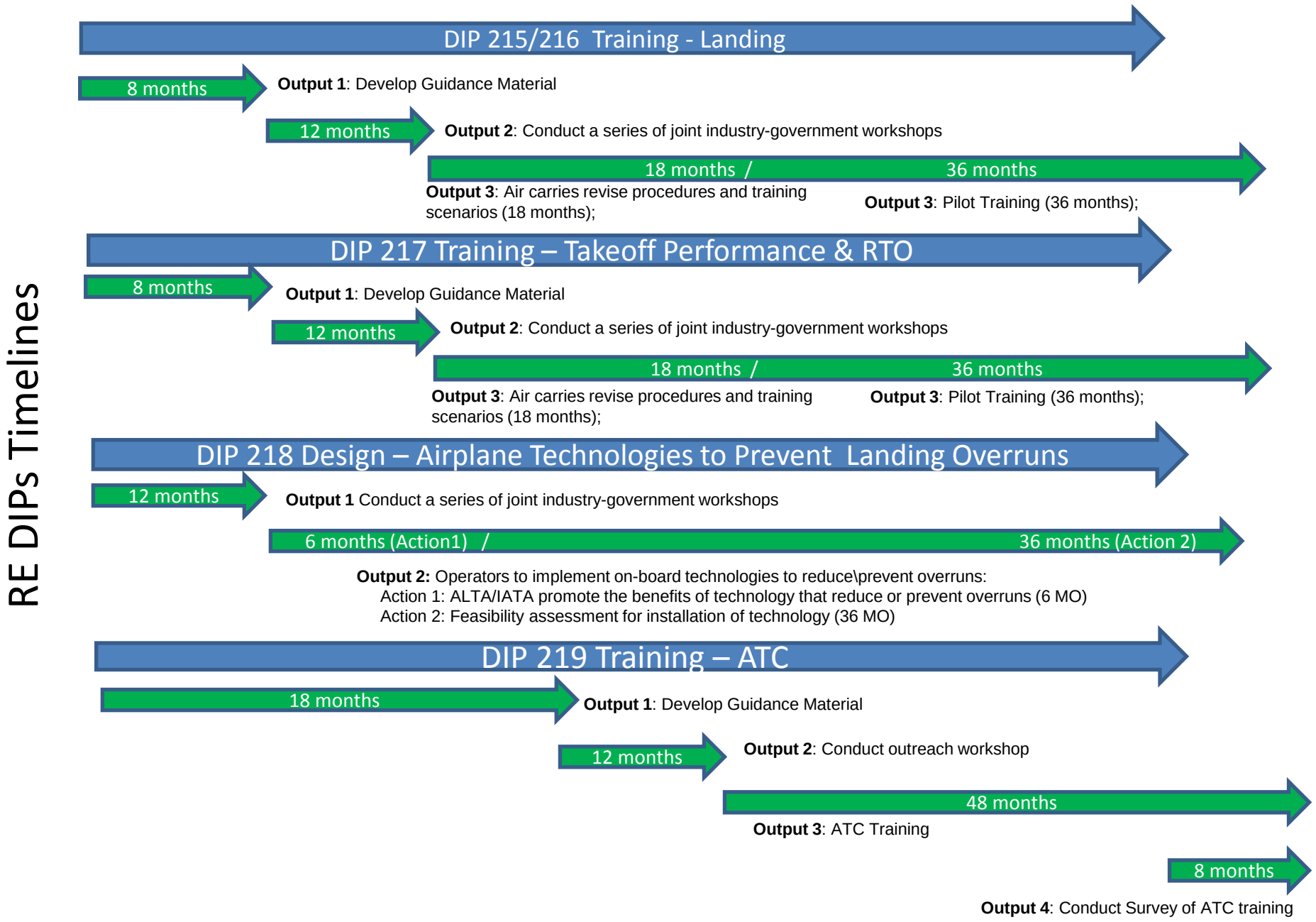
Members:

- Boeing, Embraer, ICAO (SAM & NACC), Gol, Azul, Copa Airlines, American Airlines, FAA, CANSO, IATA, Costa Rica, Brazil, IFALPA.

The RE SET TEAM

Champion: ALTA

RE DIPs - Work Timelines

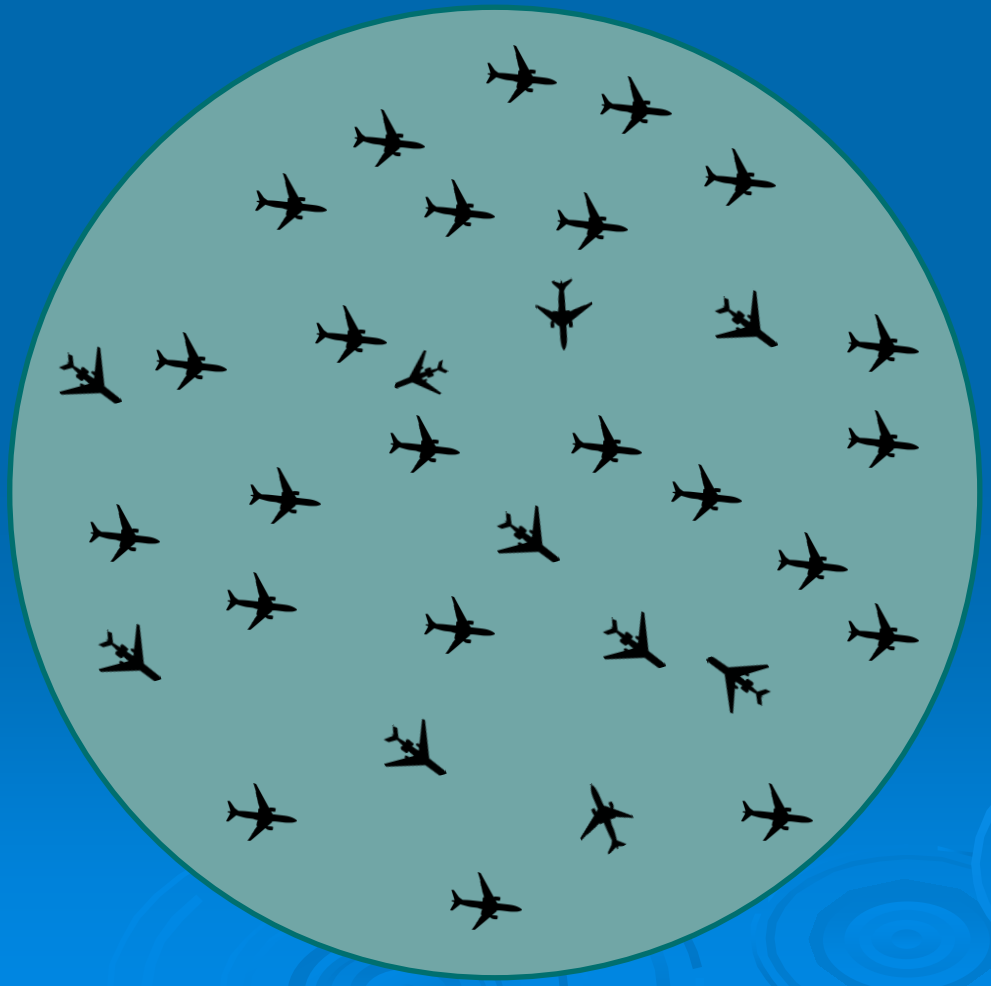


RASG-PA Objective

Reduce fatality risk for part 121 operators by 50% by 2020 based on 2010 numbers

What is Fatality Risk?

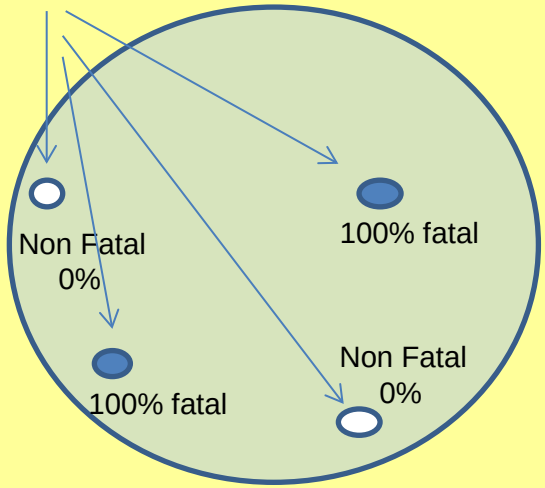
Fatality risk is a measure of a person’s (passenger or crew) chance of perishing in an accident on a randomly chosen flight.



Calculating Historical Fatality Risk

Case 1

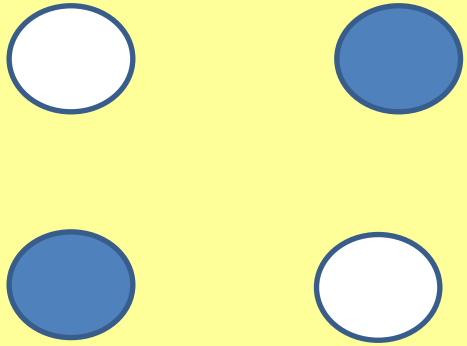
Accidents



All Flights

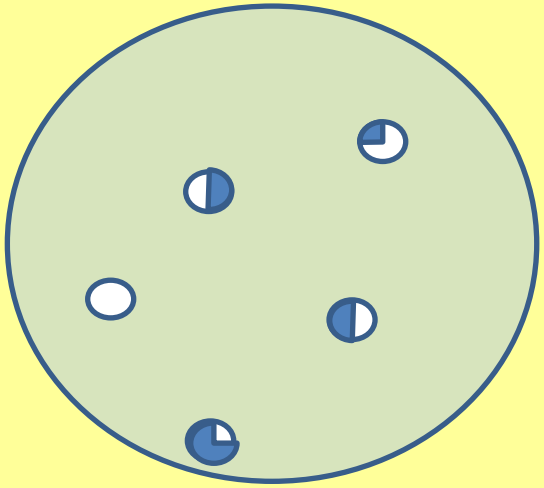
Accidents

Four Accidents - Blue is portion onboard that perish



Expectation of perishing on a randomly chosen flight= 2/total number of flights

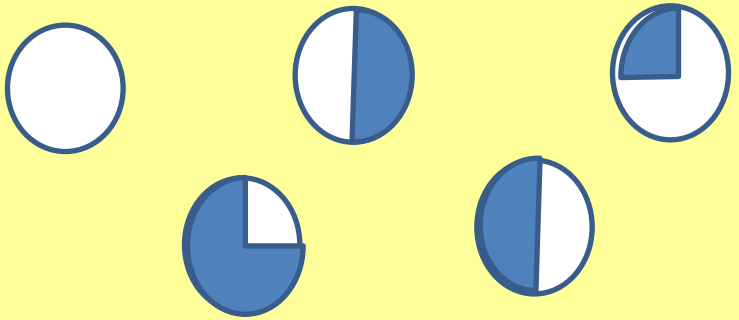
Case 2



All Flights

Accidents

Five Accidents - Blue is portion onboard that perish



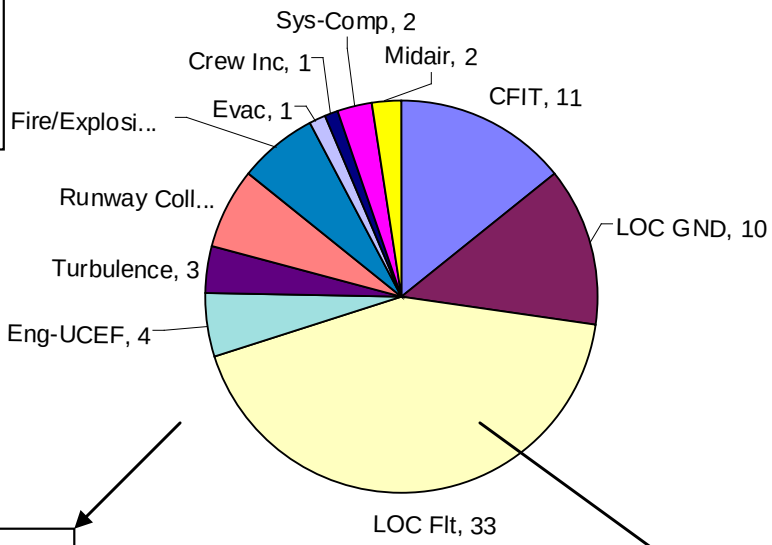
Expectation of perishing on a randomly chosen flight= 2/total number of flights

Compare Case 1 & Case 2

Chance of perishing on a randomly chosen flight is the same for Case 1 & Case 2
= 2/total number of flights

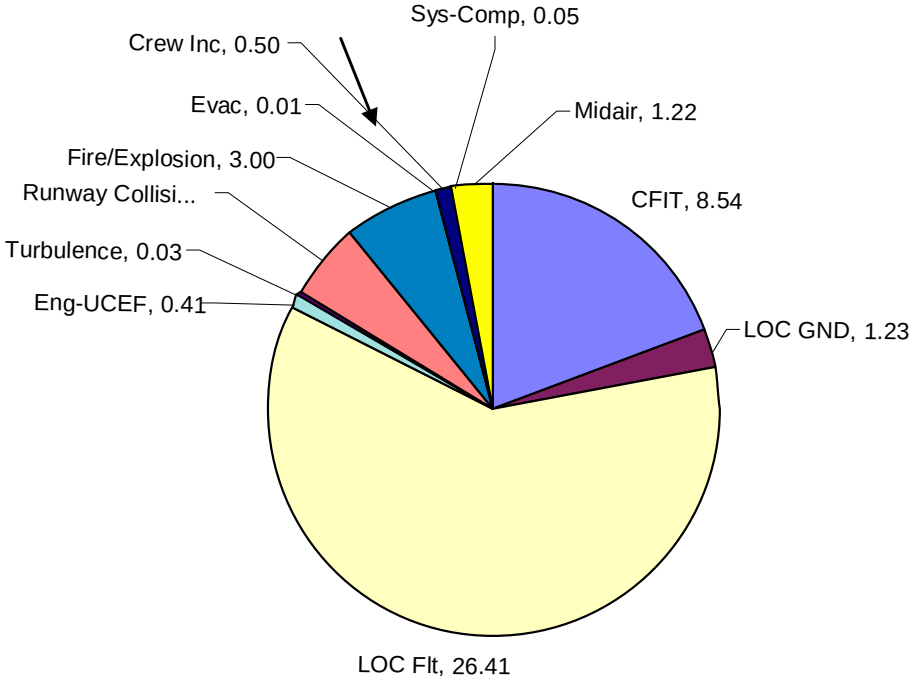
Fatality Risk Rate = Σ (portions of onboard people that perish in accidents / Σ All Fights

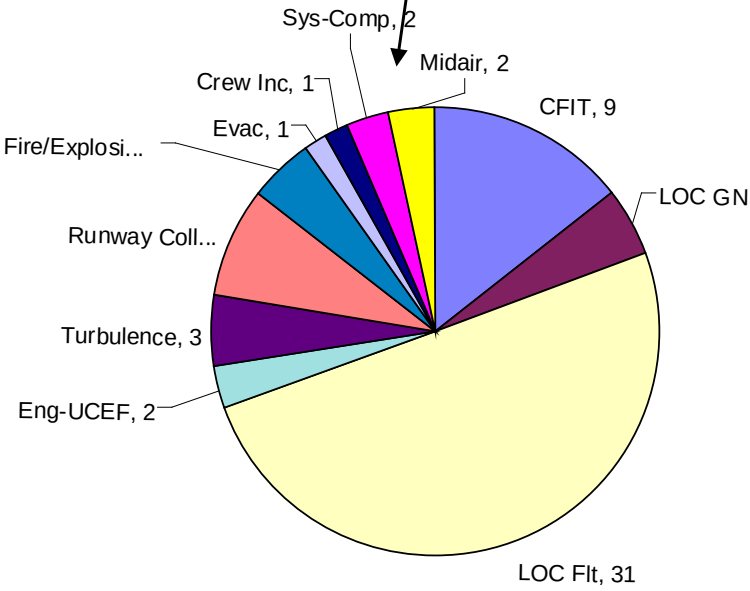
1987-2000 Part 121 Hull Loss And/or Fatal Accidents (77 Accidents)
(~118 E6 Departures 1987-2000)



Fatality risk: The number of full airplane fatality equivalents occurring in accident period (43.9 full airplane equivalents)

Fatal accident rate: The number of fatal accidents occurring in a given period (62 accidents had on board fatalities)



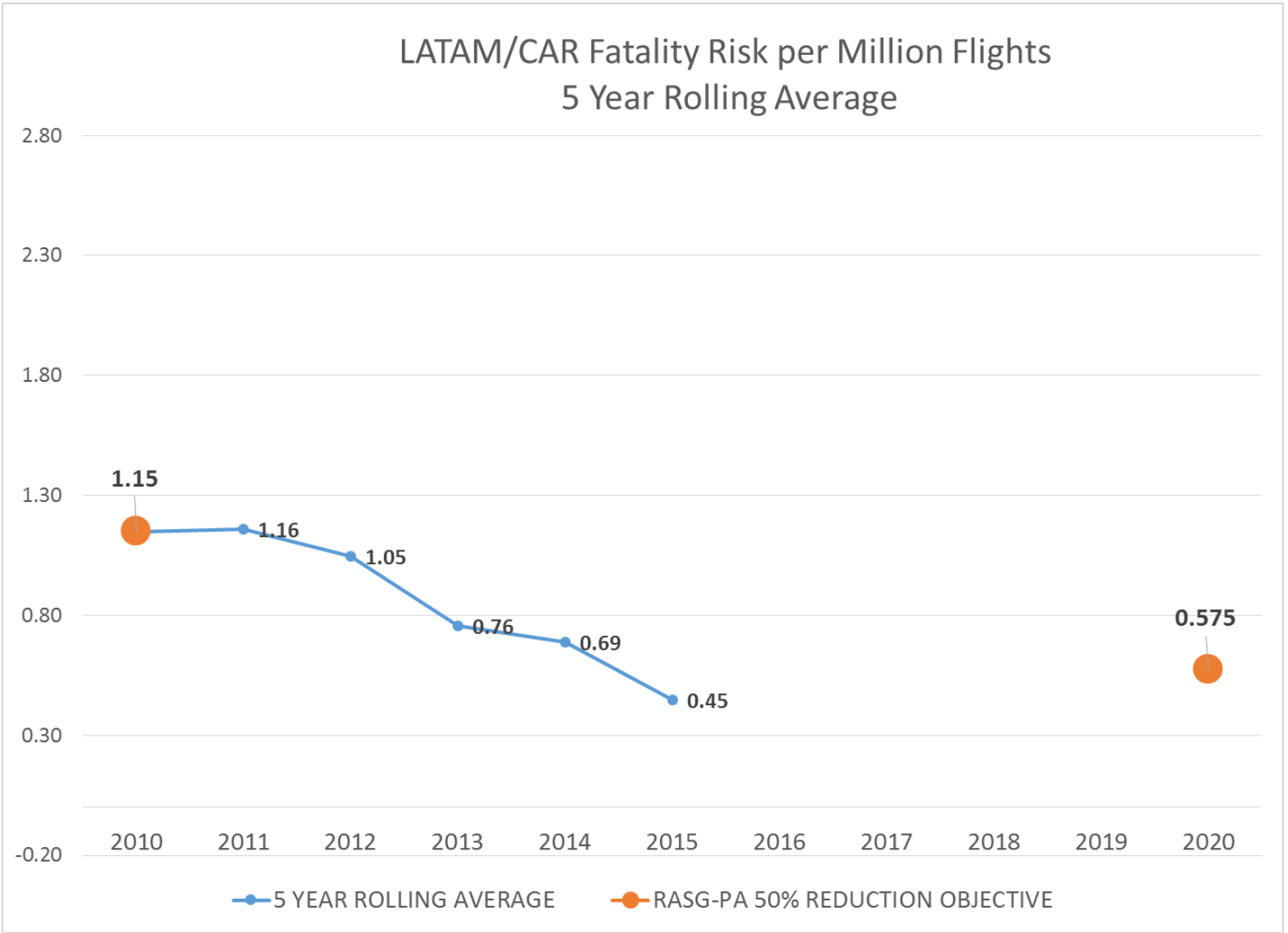


Basis for Fatality Risk Reduction (Current CAST Metric)

Basis for Fatality Accident Rate Reduction

RASG-PA Objective

- Reduce fatality risk for part 121 operators by 50% by 2020 based on 2010 numbers



Accident & Incident Trends RE

Figure 9. RE Total Occurrences Distribution per Year – Pan America

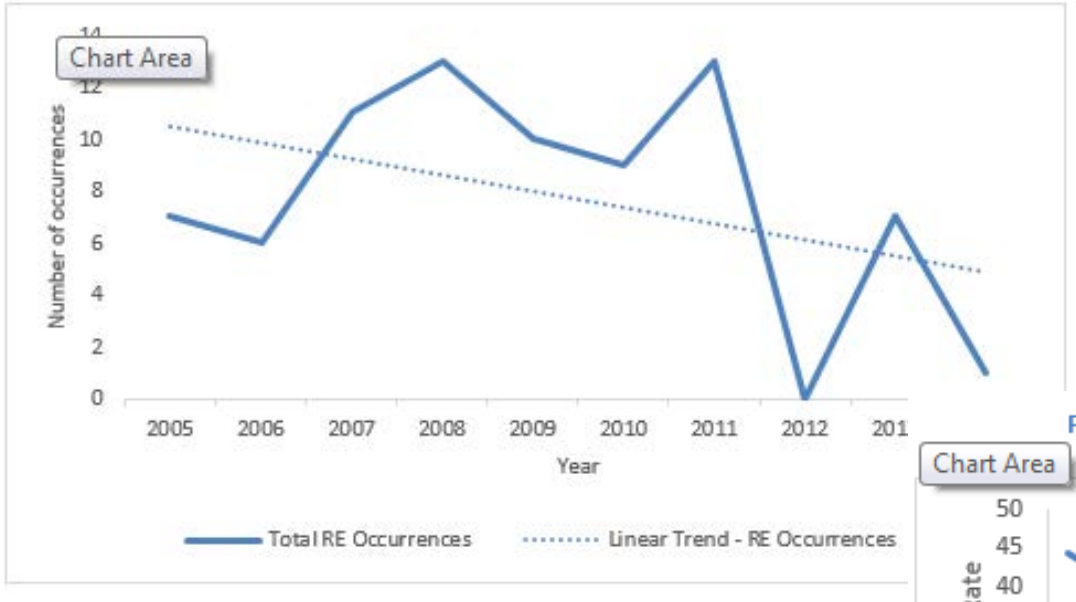
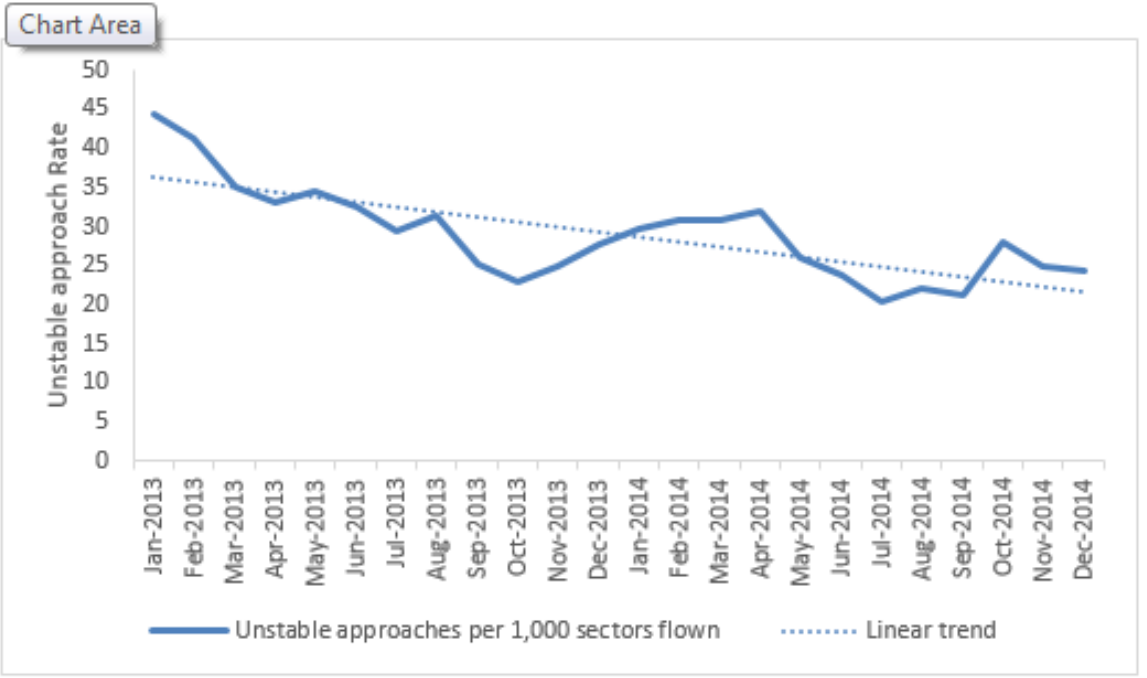


Figure 27. FDX Unstable Approach Rate Trend – CAR and SAM Regions



Accident & Incident Trends
CFIT

Figure 11. CFIT Total Occurrences Distribution per Year – Pan America

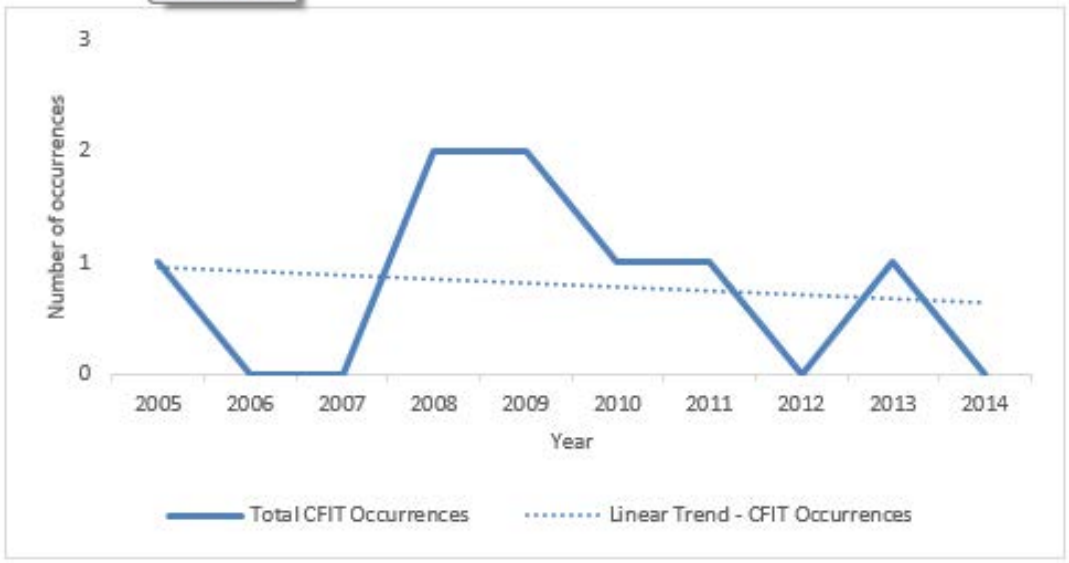
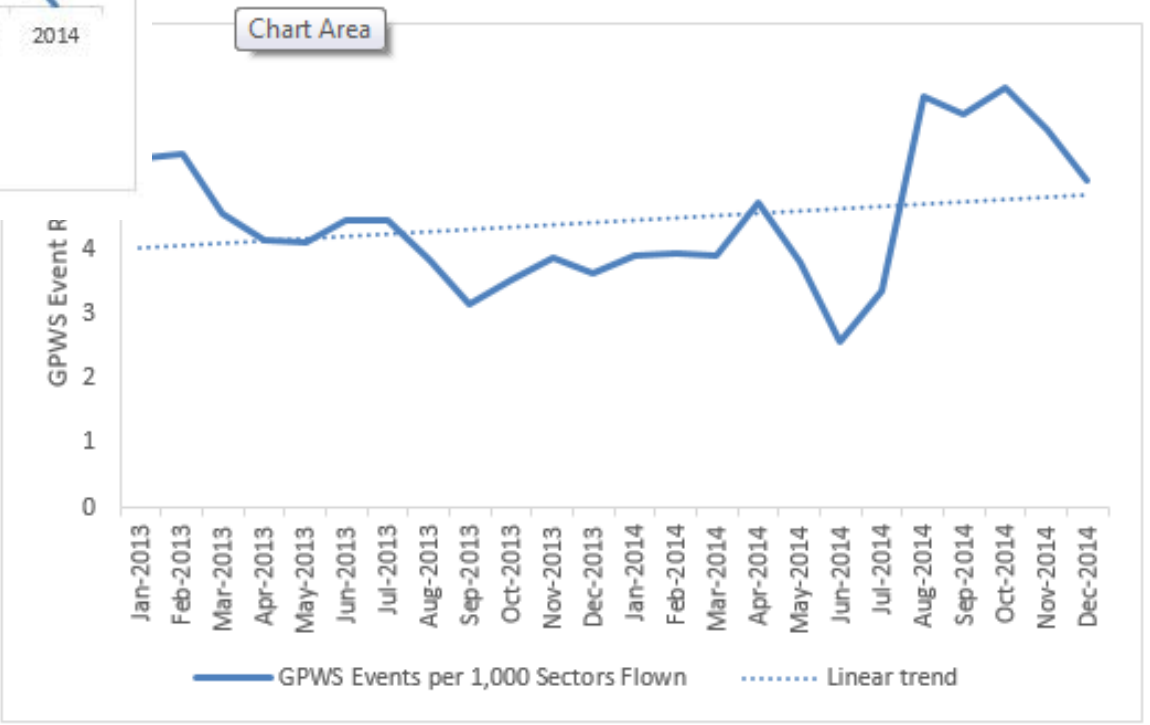


Figure 28. FDX GPWS Rate Trend – CAR and SAM Regions



Accident & Incident Trends MAC

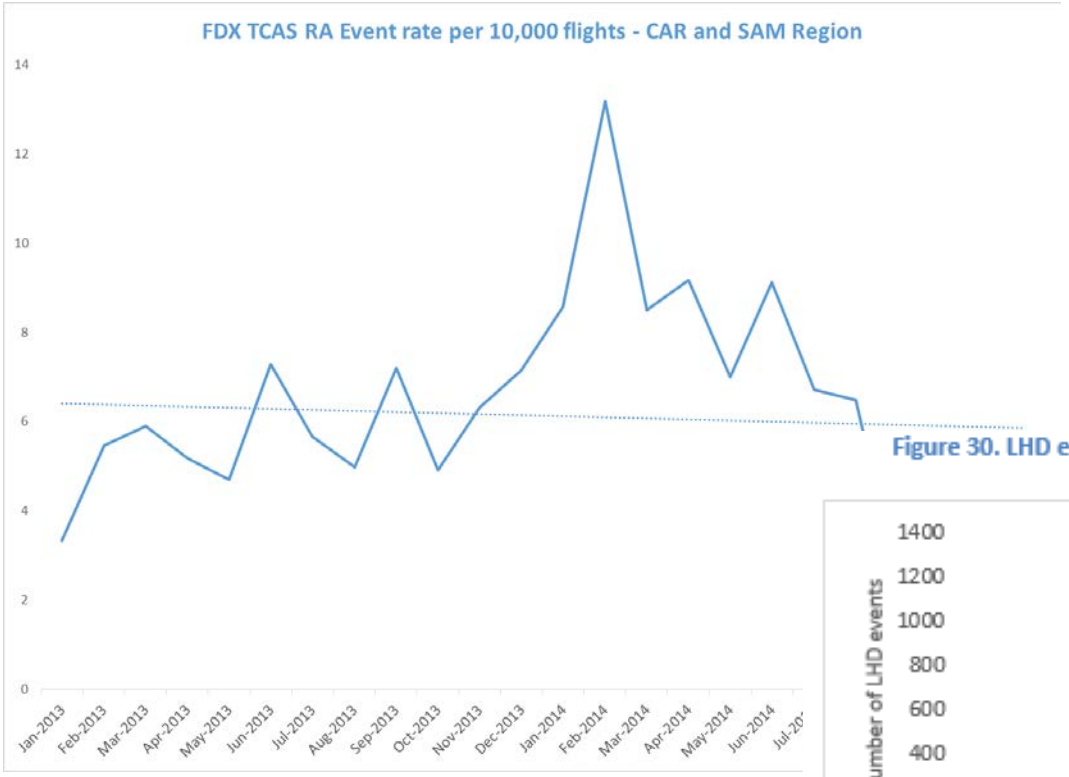
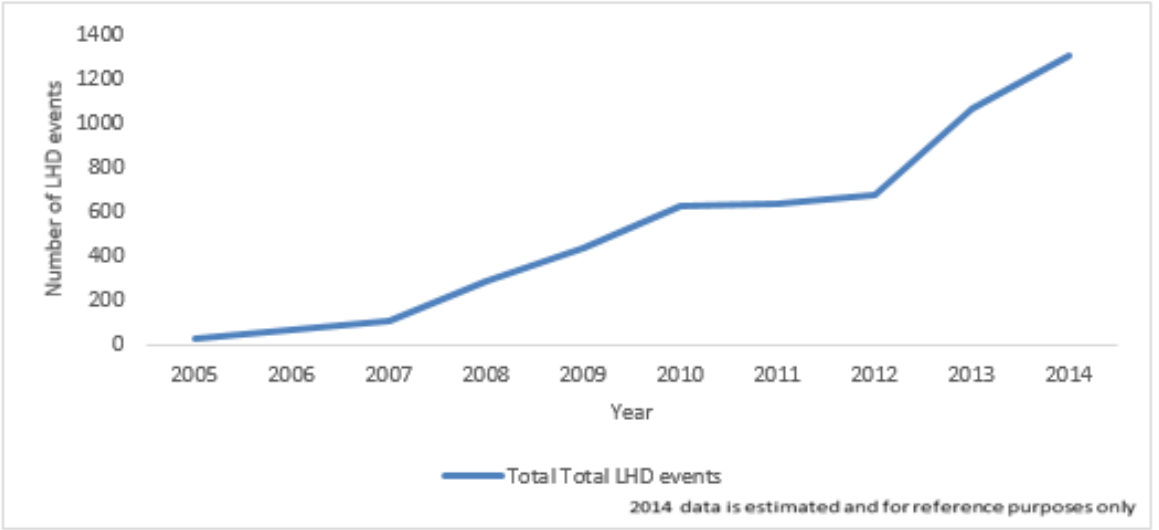
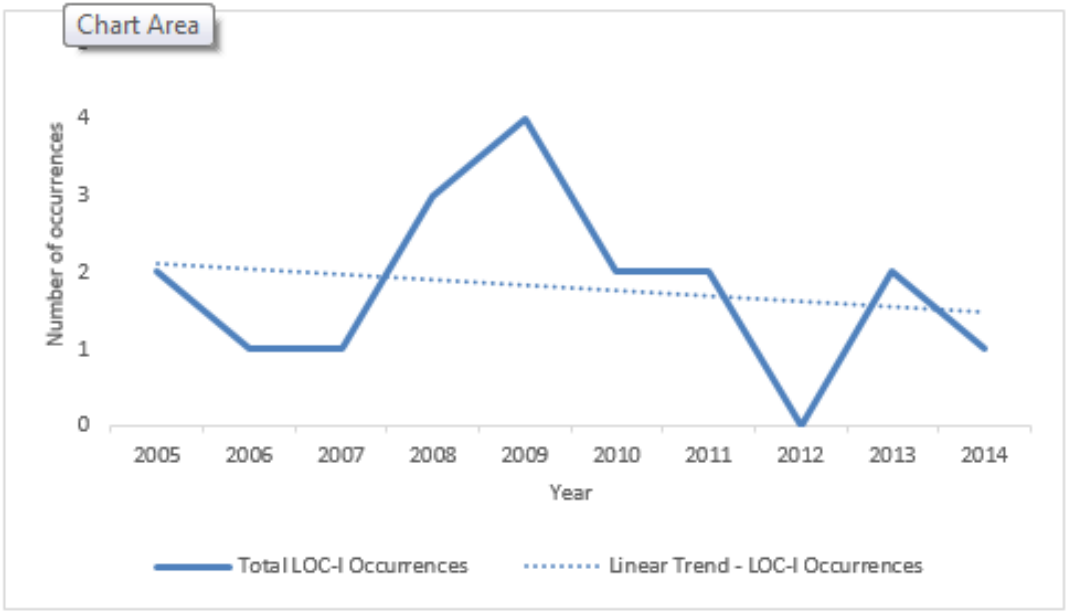


Figure 30. LHD events distribution per year. 2005-2014. CAR and SAM Regions (CARSAMMA)



Accident & Incident Trends LOC-I

Figure 13. LOC-I Total Occurrences Distribution per Year – Pan America (ICAO ADREP/ECCAIRS)



Other PA-RAST Activities

- TORs
- Interface with BCAST

Conclusions

- DIPs developed between 2008 and 2014 contributed to lower the Fatality Risk numbers in the Region, which currently supersede RASG-PA's safety objective defined for 2020. However, an additional effort is still needed to consolidate this result over the next 4 years.

- The continuous decrease and control of Fatality Risk numbers rely on the implementation, at a national level, of available DIPs by the States and Industry. State/Industry Safety Groups like BCAST in Brazil, and PASO in Costa Rica, are essential to achieve this goal. PA-RAST will keep working to support them and foster the creation of similar ones in other States.

- The development and implementation of the additional mitigation strategies by PA-RAST, through the creation of new Detailed Implementation Plans, in the four areas: CFIT, LOC-I, RE and MAC, will ensure the 2020 fatality risk objective is met.

Thank You!

Gracias!

Obrigado!