

Mid Air Collision Working Group



Summary

This presentation includes the following topics:

- Lessons learned and Air Prox causal factors (benchmarks and resources)
- WG initiatives
- Data collection
- Analysis methodology
- Initial conclusions
- Candidate DIPs (Safety Enhancements)

Lessons learned

- 70% of level busts are due to miscommunication between pilots and ATCOs;
- 40% of level busts occurs between FL 100 and FL 110;

Air Prox Causal Factors

Main hazards that lead to a loss of separation

- Weather deviations;
- Level busts;
- Frequency congestion
- Inefficient coordination between ATC sectors;
- Use of non standard phraseology;
- Airspace design;
- Vague ATC instructions and miscommunication.

WG initiatives

- Pilots and ATCOs perception survey
- Tool kits development for Pilots and ATCOs
- Establishment TCAS RA mandatory reports for pilots*
- Use of airlines' FDA data to analyze the Airspace hotspots
 - Developed an analysis methodology to segregate TCAS RA by severity crosschecking PIREPs and FDA data
- Analysis of EUROCONTROL Call Sign Similarity Rules and partnership with Brazilian regulator to establish new standards

* Airlines members of the WG

WG initiatives – Call Sign Confusion*

- Airlines' networks will be developed “free of call sign conflicts”, following Safety Rules defined by MAC WG, based on EUROCONTROL's best practices.
- A second validation will verify the “national network” among the airlines' networks

Network development with call sign safety rules by the airlines

Verification of the “national net”

Flights final approval

* Under development

Data Collection

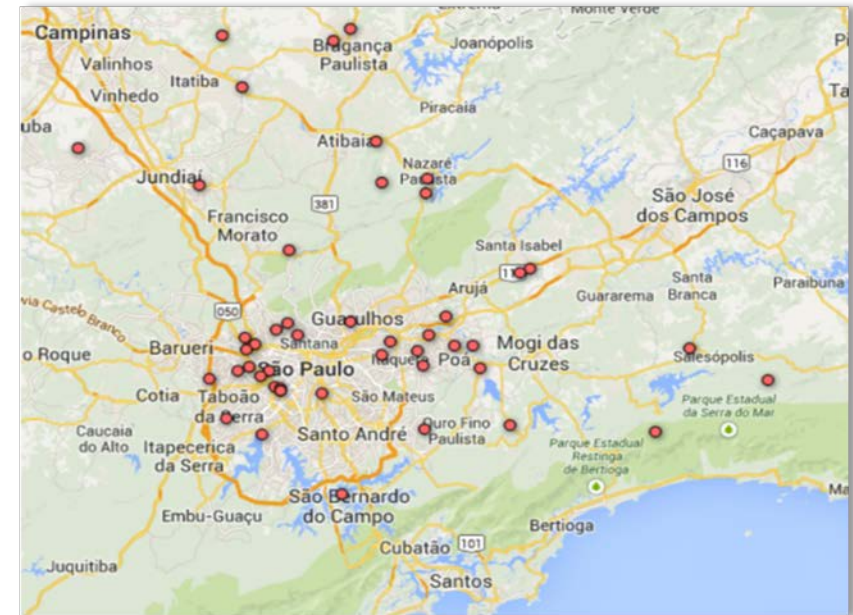
Why don't we use FDX as an information source?

- Pros:

- Great source to identify where TCAS RA events are taking place;
- May be used as a KPI after DIPs;

- Cons (Limitation of FDX):

- Impossible to separate events by severity.
- FDX just counts TCAS RA alerts



Data Collection

- Gatekeepers uses PIREPs to review TCAS RA events severity
- The events are segregated by type:
 - Nuisance alerts (caused by trajectory projection)
 - Loss of separation

// Event Date	Event Time	Flight Phase	Event No	Severity Class	Event Description	Flight No	From	Take Run
03/01/2015	10:58:58	CLIMB	1614	Class 2	TCAS RA Warning-Down	G1904	BSB	29
03/01/2015	16:38:36	DESCENT	1615	Class 2	TCAS RA Warning - UP	G1809	CNF	11
07/07/2015	11:58:57	CLIMB	1614	Class 2	TCAS RA Warning-Down	G1577	RAO	11
15/02/2015	18:12:33	DESCENT	1615	Class 2	TCAS RA Warning - UP	G9004	REC	11
17/02/2015	06:05:55	DESCENT	1615	Class 2	TCAS RA Warning - UP	G2196	BPS	11
25/02/2015	16:55:34	DESCENT	1614	Class 2	TCAS RA Warning-Down	G1567	IGU	31
25/02/2015	21:06:28	CLIMB	1614	Class 2	TCAS RA Warning-Down	G1223	CXJ	11
25/02/2015	01:11:52	DESCENT	1614	Class 2	TCAS RA Warning-Down	G9033	BEL	6

MID AIR Collision Risk Reduction Working Group

Planilha de eventos TCAS RA

Event Date (dd/mm/aaaa)	Event Time (hh:mm:ss) UTC	Flight Phase	Event No	Severity Class Class 2 - Projeção de razão Class 3 - Perda de separação	Flight No	LAT (Grau- decimal- com valor- po-itivo- - com valor- egativo-	W
01/01/2016	14:46:58	INI. CLIMB	1614	Class 3	G1941	-20,2262000	
07/01/2016	16:43:42	DESCENT	1615	Class 3	G1437	-22,6375000	
25/01/2016	20:26:42	FINAL	1615	Class 3	G1213	-23,5814000	
03/02/2016	10:23:37	DESCENT	1615	Class 3	G1837	-15,4467000	
19/02/2016	22:51:57	CRUISE	1614	Class 3	G2092	-22,9909000	

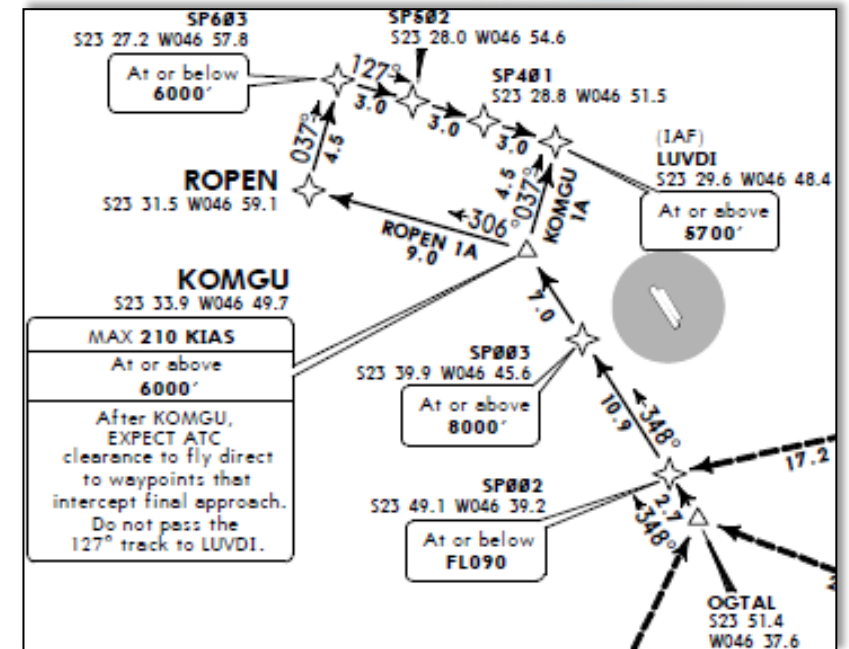
Analysis methodology

- All events are sent to ANS
- ANS consolidates all TCAS RA events and airspace structure in a Google Earth file;
- Hot Spot identification criteria:
 - 2.5nm volume area around events
 - At least 3 different events – ideally with different operators
- The WG analyzes the hot spots and their root causes



Initial conclusions

- Displaced STARs generate more TCAS RA events than regular arrivals;
- Human factors should be considered during call sign selection in the airline's network;
- Avoid altitude constraints between FL100 and FL110.



Candidate DIPs (Safety Enhancements)

- A Regulation to standardize and make mandatory the report of TCAS RA events from part 121 operators to brazilian ANS;
- The development of a call sign validation electronic system;
- Use of the best practices identified by the WG in the airspace design.

Questions?



Obrigado!

Gracias!

Thank you!