



Ninth Regional Aviation Safety Group — Pan America Plenary Meeting (RASG-PA/9)

Panama City, Panama, 23 June 2016

Agenda Item 9: Other Safety Initiatives

SRVSOP ACTIVITIES FOR OPERATIONAL RISK MITIGATION IN THE REGION

(Presented by the Secretariat)

EXECUTIVE SUMMARY	
This working paper presents an overview of SRVSOPs risk mitigation activities related to ACAS II version 7.1 requirements and the aeroplane upset prevention and recovery training (UPRT).	
Action:	Suggested Actions are presented in Section 3.
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"> • Safety
<i>References:</i>	<ul style="list-style-type: none"> • Annex 6 - <i>Operation of Aircraft</i> • Annex 10 - <i>Aeronautical Telecommunications</i>

1. Introduction

1.1 SRVSOPs is responsible for the development of Latin American Aviation Regulations (LARs) as well as other relevant publications, training courses, technical assistance and other activities directly linked to the 3 basic SMS defences: rules, technology and training.

1.2 Among SRVSOP core functions are:

- Propose uniform regulations and procedures in areas related to civil aviation safety, which are consistent with the relevant standards and recommended practices contained in the Annexes to the Convention on International Civil Aviation and with the associated procedures and guidelines, aimed at the harmonization and/or adoption of said regulations and procedures by the participating States.

- Establish and implement a safety oversight technical support programme in the participating States, in close coordination with ICAO, with a view to maintaining and/or ensuring compliance with their responsibilities emanating from the Convention on International Civil Aviation and its associated procedures and guidelines, and from any relevant regulations and procedures to be adopted by the SRVSOP for implementation by its members, in compliance with aforementioned ICAO standards.
- Encourage the establishment of a training programme for the technical personnel of the participating States, with a view to the dissemination of the Latin American Aeronautical Regulations (LAR) and their implementation in the States that will adopt them or harmonize their own regulations therewith.
- Provide advice, assistance and training to the participating States that so require for the implementation and application of the standards and recommended practices contained in the Annexes to the Convention on International Civil Aviation and in the associated procedures and guidelines, as well as any uniform regulations and procedures that the SRVSOP may adopt, coordinating the planning and execution of relevant actions.

1.3 In this regard, the SRVSOP is continuously updating the LAR, procedures manuals and instructions courses to ensure their conformity with provisions related to safety included in the International Civil Aviation Convention and its Annexes, and its compatibility with the ICAO Universal Safety Oversight Audit Programme (USOAP), in order to make available to the States a set of updated efficient regulation.

1.4 Within this context, this working paper pretends to illustrate the advantages offered by a Regional Safety Oversight Organization (RSOO) regarding safety improvement and fulfilment and harmonization of SA RPs (increase in the EI), using as example the activities developed by the SRVSOP on the ACAS II Version 7.1 implementation and the aeroplane upset prevention and recovery training (UPRT), as per details presented in Appendices A and B to this working paper.

2. Development

2.1 **Appendix A** presents an overview of SRVSOP main activities to support, disseminate and implement standards and practices recommended by ICAO regarding ACAS II Version 7.1 in the throughout the region. This includes, besides requirements and procedures (regulations), software update (technology) and modification of training programmes.

2.2 **Appendix B** presents an overview of SRVSOP main activities to support, disseminate and implement standards and practices recommended by ICAO regarding the aeroplane upset prevention and recovery training (UPRT). . This includes, besides requirements and procedures (regulations), software update (technology) and modification of training programmes.

3. **Suggested Actions**

3.1 The meeting is invited to note the information provided in this working paper and its Appendixes, and to;

- a) Recognize SRVSOPs efforts to improve ICAO SARPs effective implementation (EI) in the region through timely adoption of SARPs, production of LARs and other material and activities to promote the implementation of ICAO initiatives; and
- b) Recognize RSOO contribution and advantages to help improve overall safety in the region, as drivers of ICAO initiatives aimed to mitigate risks.

APPENDIX A ACAS II Version 7.1

I Regulatory background

Annex 6 Part I Standard 6.18 6.18 - Aeroplanes required to be equipped with an airborne collision avoidance system (ACAS II):

6.18.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than 19 passengers shall be equipped with an airborne collision avoidance system (ACAS II).

6.18.3 An airborne collision avoidance system shall operate in accordance with the relevant provisions of Annex 10, Volume IV.

Annex 10, Volume IV Standard 4.3.5 - Resolution advisories (RAs):

4.3.5.3.1 New ACAS installations after 1 January 2014 shall monitor own aircraft's vertical rate to verify compliance with the RA sense. If non-compliance is detected, ACAS shall stop assuming compliance, and instead shall assume the observed vertical rate.

Note 1.— This overcomes the retention of an RA sense that would work only if followed. The revised vertical rate assumption is more likely to allow the logic to select the opposite sense when it is consistent with the non-complying aircraft's vertical rate.

Note 2.— Equipment complying with RTCA/DO-185 or DO-185A standards (also known as TCAS Version 6.04A or TCAS Version 7.0) do not comply with this requirement.

Note 3.— Compliance with this requirement can be achieved through the implementation of traffic alert and collision avoidance system (TCAS) Version 7.1 as specified in RTCA/DO-185B or EUROCAE/ED-143.

4.3.5.3.3 After 1 January 2017, all ACAS units shall comply with the requirements stated in 4.3.5.3.1

On the other hand, EASA has regulated the implementation of version 7.1 for the European airspace starting 1 March 2012, for all aircrafts with maximum take-off mass above 5 700 kg or for those authorized to transport more than 19 passengers. Thus, the established deadline is more restrictive than that established in Annex 10.

II Material produced by SRVSOP for its member States:

The SRVSOP has developed the following material in support of the implementation of requirements related to the ACAS II version 7.1:

a) LAR Requirements

In compliance with its mandate to develop requirements that are compatible with standards contained in the ICAO Annexes, the provisions of Annex 6 Part I and Annex 10 Part IV indicated below have been incorporated in LAR 121:

LAR 121.855 - Airborne collision avoidance system ACAS II/TCAS II

- (a) *All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than 19 passengers shall be equipped with an airborne collision avoidance system (ACAS II), and a suitable Mode “S” transponder.*
- (b) *New ACAS installations after 1 January 2014 shall monitor own aircraft’s vertical rate to verify compliance with the RA sense. If non-compliance is detected, ACAS shall stop assuming compliance, and instead shall assume the observed vertical rate. Compliance with this requirement can be achieved through the implementation of traffic alert and collision avoidance system (TCAS) Version 7.1 as specified in RTCA/DO-185B or EUROCAE/ED-143.*
- (c) *After 1 January 2017, all ACAS units shall comply with the requirements stated in paragraph (b).*
- (d) *Unless otherwise stated in the instruction related to air traffic control, to avoid unnecessary notices from the airborne collision avoidance system (ACAS II) in aircrafts flying or approaching adjacent altitudes or flight levels, operators should specify procedures through which an aircraft ascending or descending an altitude or the assigned flight level, especially when using autopilot, it should be done in a speed of less than 8 m/s (1 500 ft/min) (depending of available instruments) over the last 300 m (1 000 ft) from ascending or descending to the assigned level.*

b) Procedures manual for OPS inspectors

Based on Doc. 9863, and USOAP CMA Protocol Questions 4.155 and 4.223, detailed procedures for inspectors have been developed by SRVSOP. Operations Inspector Manual (MIO) Part II, Volume II, Chapter 19 “ACAS II - Operations approval” is readily available.

Additionally, MIO Part II, Volume II, Chapter 3 “Training programs” has been amended to include ACAS II training for pilots.

c) Advisory circular

An Advisory Circular containing acceptable means of compliance for ACAS II operational approval, and ACAS II training program approval is also readily available for the industry.

III States harmonisation and implementation

The SRVSOP has circulated a survey among its State members to know the level of implementation of standards contained in Annex 6 and 10 and LAR 121, in relation to ACAS version 7.1 requirement starting 1 January 2017

All States having adopted LARs are compatible with Annexes 6 and 10 regarding the ACAS version 7.1 requirement starting 1 January 2017.

The results of the survey are presented below:

State	To require version 7.1?	Reference	Obs.
Argentina*	YES	121.855	To require version 7.1 from January 2017
Brazil	NO	-	In the process to update local regulations
Bolivia*	YES	121.855	No response have been received
Chile	NO	-	Gradual implementation is expected
Colombia	NO	-	Only 7.0 is required
Cuba	YES	-	No response have been received
Ecuador*	YES	121.855	To require version 7.1 from January 2017
Panamá	YES	Art. 188	Gradual implementation is expected
Paraguay*	YES	121.855	To require version 7.1 from January 2017
Peru	NO	121.855	No response have been received
Uruguay*	YES	121.855	To require version 7.1 from January 2017
Venezuela	N/R	N/R	No response have been received

**States that have adopted the LAR*

APPENDIX B UPSET PREVENTION AND RECOVERY TRAINING (UPRT)

I Regulatory background

Amendment 172 of Annex 1 derived from proposals presented by the Secretariat to introduce dispositions on aeroplane upset prevention and recovery training (UPRT) imparted to aircrafts pilots:

2.1.5.2 Type rating as required by 2.1.3.2 a)

The applicant shall have:

...

a) *gained, under appropriate supervision, experience in the applicable type of aircraft and/or flight simulator in the following:*

...

— *where applicable, instrument procedures, including instrument approach, missed approach and landing procedures under normal, abnormal and emergency conditions, including simulated engine failure;*

— *for the issue of an aeroplane category type rating, upset prevention and recovery training; and — procedures for crew incapacitation and crew coordination including allocation of pilot tasks; crew cooperation and use of checklists;*

On the other hand, Amendment 38 to Annex 6 Part I derived, among other aspects, of a proposal presented by ICAO Secretariat to introduce dispositions related to aeroplane upset prevention and recovery training (UPRT) addressed to aircrafts pilots. The amendment related to UPRT has the object to mitigate loss of control events through aeroplane upset prevention and recovery training requirements, with the support of guidance material. Annex 6, Part I, introduced an UPRT requirement in flight crew members training programmes:

9.3 Flight crew member training programmes

9.3.1 An operator shall establish and maintain a ground and flight training programme, approved by the State of the Operator, which ensures that all flight crew members are adequately trained to perform their assigned duties. The training programme shall:

- a) *include ground and flight training facilities and properly qualified instructors as determined by the State of the Operator;*
- b) *consist of ground and flight training in the type(s) of aeroplane on which the flight crew member serves;*
- c) *include proper flight crew coordination and training in all types of emergency and abnormal situations or procedures caused by engine, airframe or systems malfunctions, fire or other abnormalities;*
- d) *include upset prevention and recovery training;*
- e) *include training in knowledge and skills related to visual and instrument flight procedures for the intended area of operation, charting, human performance including threat and error management and in the transport of dangerous goods;*

- f) ensure that all flight crew members know the functions for which they are responsible and the relation of these functions to the functions of other crew members, particularly in regard to abnormal or emergency procedures; and
- g) be given on a recurrent basis, as determined by the State of the Operator and shall include an assessment of competence.

II. Material produced by SRVSOP for its member States:

The SRVSOP has carried out the following activities in support of the implementation of the UPRT requirement:

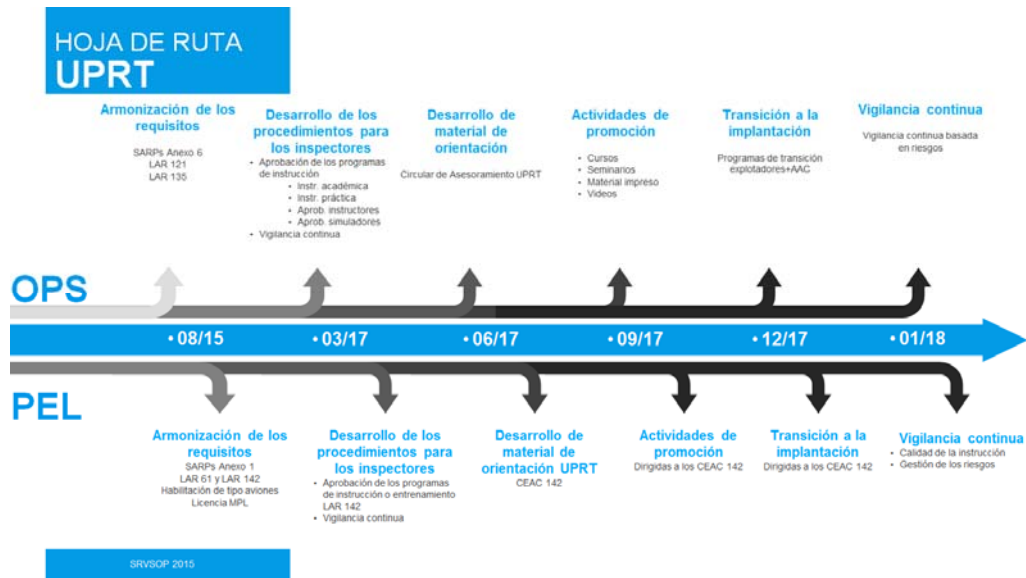
a) UPRT – Loss of control meeting

The ICAO SAM Regional Office jointly with Airbus held on 29 May 2015 an “UPRT – Loss of control (LOC-I) meeting” on May 29, 2015 in order to provide knowledge and guidelines on the nature of inflight loss of control, previous versions, contributing factors and control methods, as well as recommended standards and practices on aeroplane upset prevention and recovery training (UPRT) for aircrafts pilots and safety improvement.

The meeting counted with the participation of 108 people representing industry, responsible entities for regulations, and international organizations.

The SRVSOP Technical Committee was involved throughout the meeting, and prepared the following regional UPRT roadmap:

b) SRVSOP UPRT Roadmap



c) LAR Requirements

In compliance with its mandate to develop requirements that are compatible with standards contained in ICAO Annexes, LAR 60 – Flight simulators qualification has been developed—and Annex 1 and 6 Part I provisions have been incorporated in LAR 61, 121, 135 and 141, as follows:

LAR 60 – Flight simulators qualification

A multinational group of inspectors specialized in rating levels fidelity of training devices for flight simulation has been conformed involving 8 experts from 3 States in order to:

- Develop LAR 60 Appendix 3 and 4 on qualification standards for full flight simulators (FFS) and helicopter flight training devices (FTD).
- Define a procedure for the acceptance, recognition and homologation of FSS previously qualified by other States outside the SRVSOP.
- Validate LAR 60 extension proposal to cover basic flight training devices use don training centres.
- Develop procedure manuals, audit protocols and training programs for inspectors.
- Ensure Doc. 9625 (UPRT) compatibility.

LAR 61.170 Additional ratings

(d) Rating for any helicopter, plane and aircraft certified for 2 or more flight crewmembers type rating:

The licence owner that requests to add a rating with the above characteristics to his licence, shall comply with the following requirements:

- (1) Gained, under appropriate supervision, experience in the applicable type of aircraft and/or flight simulator in the following:*
 - (iii) where applicable, instrument procedures, including instrument approach, missed approach and landing procedures under normal, abnormal and emergency conditions, including simulated engine failure;*
 - (iv) for the issue of an aeroplane category type rating, upset prevention and recovery training; and ...*

61.320 Flight experience (Chapter F: Multi-crew Pilot Licence (MPL) – Aircraft)

- (b) *Part of the actual flight experience includes at least the requirements listed in Section 61245 (a), corresponding to aircraft private pilot licence, aeroplane upset prevention and recovery training, night flight and instruments-guided flights.*

121.1520 Training programme – Generals

- (a) *An operator shall establish and maintain a ground and flight training programme, approved by the State of the Operator, which ensures that all flight crew members are adequately trained to perform their assigned duties.*

- b) *The training programme shall:*

- (1) *Shall comply with requirements established in this chapter and in Appendixes E and F of the present regulations;*
- (2) *Include adequate means, in ground and flight, as well as operators qualified instructors and inspectors duly approved;*
- (3) *consist of ground and flight training in the type(s) of aeroplane on which the flight crew member serves;*
- (4) *include proper flight crew coordination and training in all types of emergency and abnormal situations or procedures caused by engine, airframe or systems malfunctions, fire or other abnormalities;*
- (5) *include upset prevention and recovery training;*
- (6) *include training in knowledge and skills related to visual and instrument flight procedures for the intended area of operation, charting, human performance including threat and error management and in the transport of dangerous goods;*
- (7) *ensure that all flight crew members know the functions for which they are responsible and the relation of these functions to the functions of other crew members, particularly in regard to abnormal or emergency procedures; and*
- (8) *be given on a recurrent basis, as determined by the State of the Operator and shall include an assessment of competence.*

135.1110 Training program: Generals

- (b) *The training programme shall:*

- (1) *Shall comply with requirements established in this chapter and in Appendixes E and F of the present regulations;*
- (2) *Include adequate means, in ground and flight, as well as operators qualified instructors and inspectors duly approved;*

- (3) consist of ground and flight training in the type(s) of aeroplane on which the flight crew member serves;*
- (4) include proper flight crew coordination and training in all types of emergency and abnormal situations or procedures caused by engine, airframe or systems malfunctions, fire or other abnormalities;*
- (5) include upset prevention and recovery training;*
- (6) include training in knowledge and skills related to visual and instrument flight procedures for the intended area of operation, charting, human performance including threat and error management and in the transport of dangerous goods;*
- (7) ensure that all flight crew members know the functions for which they are responsible and the relation of these functions to the functions of other crew members, particularly in regard to abnormal or emergency procedures; and*
- (8) be given on a recurrent basis and shall include an assessment of competence as required in this regulations.*

d) Inspector procedures

Based on Doc. 10011 ICAO Aeroplane upset prevention and recovery training UPRT Manual, and UPRT roadmap deadlines, SRVSOP has planned to develop for the first quarter of 2017a Chapter of the MIO including inspectors training programme procedures under the approval criteria of LAR 121 and 135, covering UPRT aspects, as well as flight schools training programmes under LAR 142.

e) Advisory Circulars

Based on Doc. 10011 ICAO Aeroplane upset prevention and recovery training UPRT Manual, and UPRT roadmap deadlines, SRVSOP has planned to develop for implementation during the first quarter of 2017 an advisory circular as orientation material for air services operators containing acceptable means of compliance (MAC) for the approval of 121 and 135 operators training programmes, and flight schools training programmes under LAR 142.