



Upset Prevention and Recovery Training (UP&RT) Provisions: What do they say and why?

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Challenges of Loss of Control In-flight

“An accident caused by the loss of control of an aircraft in-flight is very rare, but over the last eight years these accidents have resulted in more fatalities in scheduled commercial operations than any other type, including runway incursions, runway excursions and controlled flight into terrain”



Nancy Graham

Director of ICAO's Air Navigation Bureau



Agenda

- 1. Why do we need UP&RT SARPs?**
- 2. How did we get to this point?**
 - a. Identified training concerns
 - b. Process
 - c. UP&RT as part of the answer to addressing LOC-I
- 3. What do the ICAO provisions say?**
- 4. What are the big changes?**
- 5. What are the implications?**
- 6. What guidance is out there?**



Why do we need UP&RT SARPs?

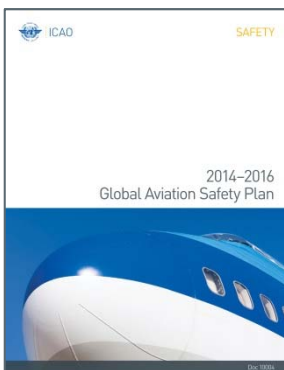


Why do we need UP&RT SARPs?

- **Mitigating Loss of Control In-Flight (LOC-I) accidents is an ICAO Safety Priority**
- **Upset Prevention and Recovery Training (UP&RT) for pilots is one means to address this priority**
- **Only aeroplane pilots were considered**

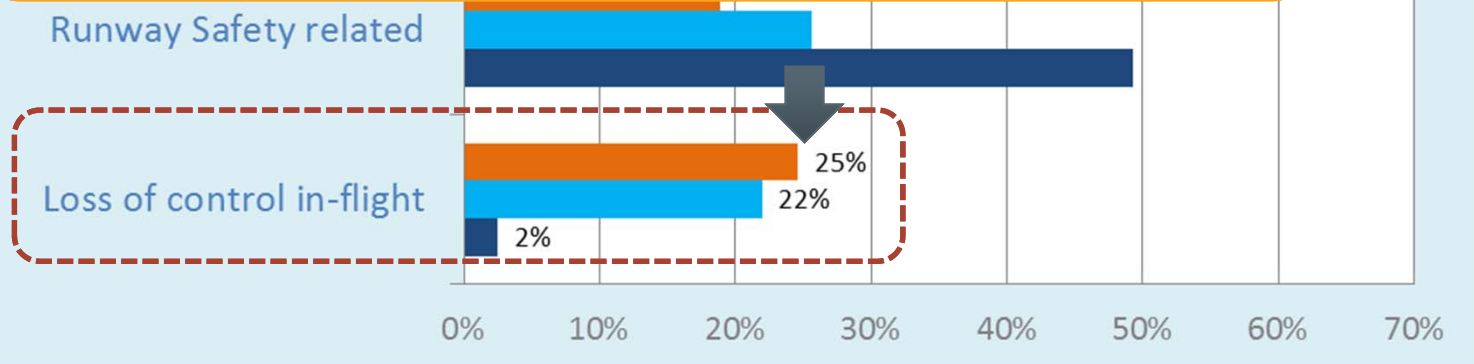


Top 3 ICAO Safety Priorities



Percentage of All Accidents: 2006-2013

Applying the same approach:
Global Collaboration



* Accidents involving scheduled commercial air transport with maximum take-off weight exceeding 5 700 kg



How did we get to this point?



Process - How did we get to this point?

- **Voluntary work force: develops proposals for ICAO provisions and recommends changes – 3 sources:**
 - RAeS's ICATEE worked 2009-2013 to deliver a draft manual to ICAO
 - LOCART initiative (ICAO, FAA ARC, EASA, Regulators, SME, OEM,...) delivered a report
 - Using the existing Airplane Upset Recovery Training Aid (AURTA)

ICATEE - Intl Committee for Aviation Training in Extended Envelopes

LOCART - Loss of Control Avoidance and Recovery Training

ARC – Aviation Rulemaking Committee



Process - How did we get to this point?

- **ICAO:**

- Secretariat participated in ICATEE and LOCART work
- ICAO integrated material from the 3 sources
- Secretariat developed and ran the Annex and PANS-TRG (Procedures for Air Navigation Services - Training) proposals through the ICAO adoption/approval process
- Guidance material will be published under the authority of the Secretary General

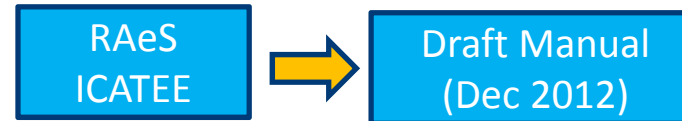
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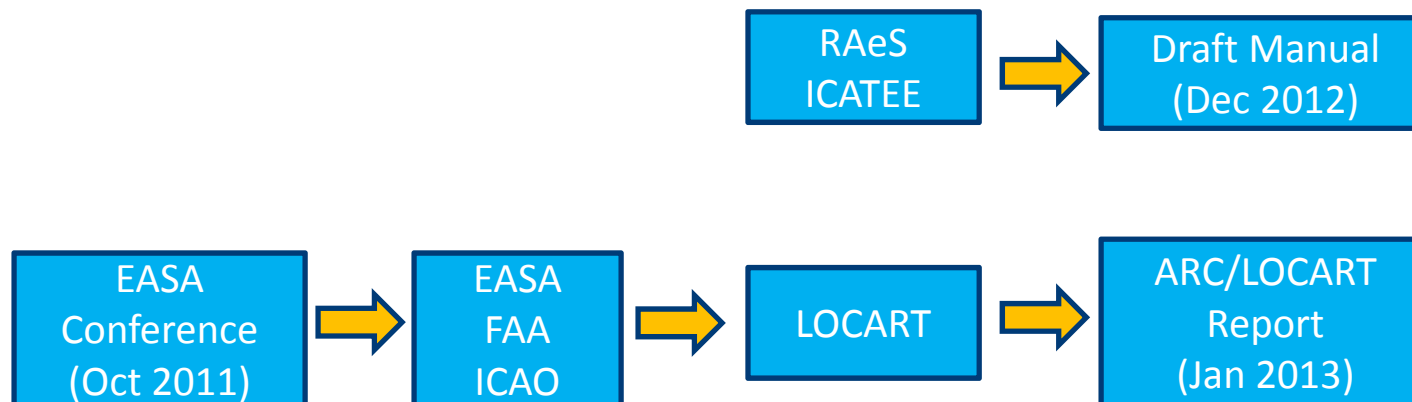


Process



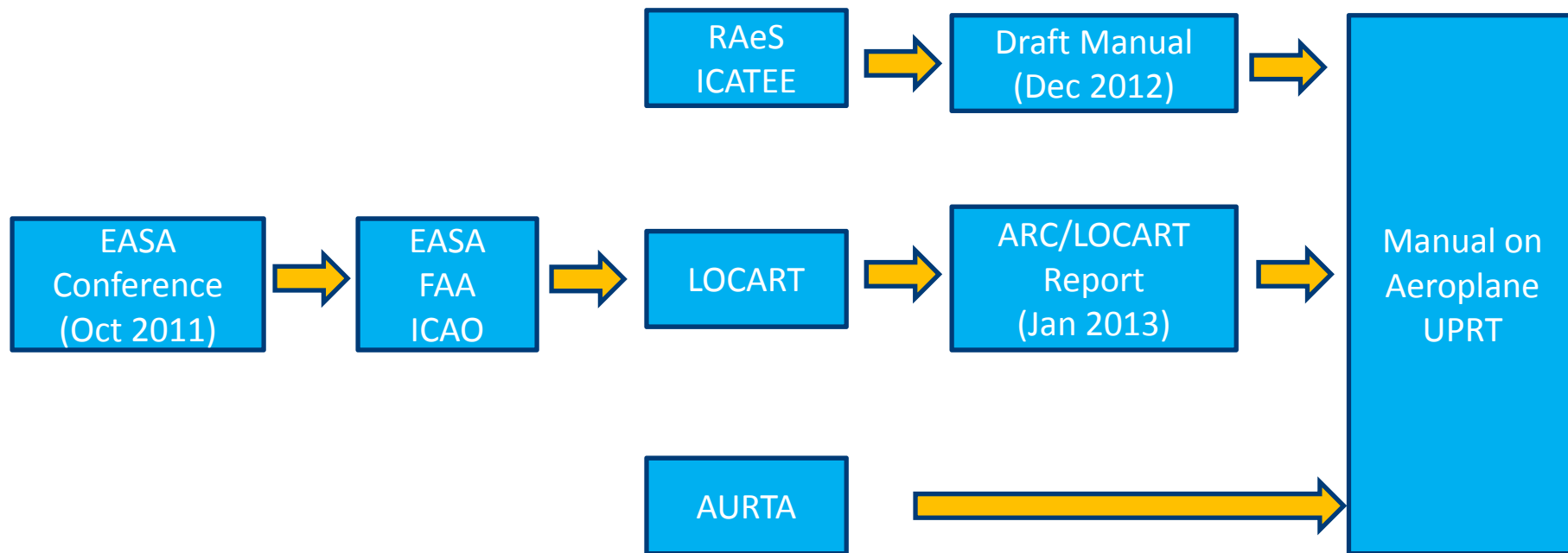


Process



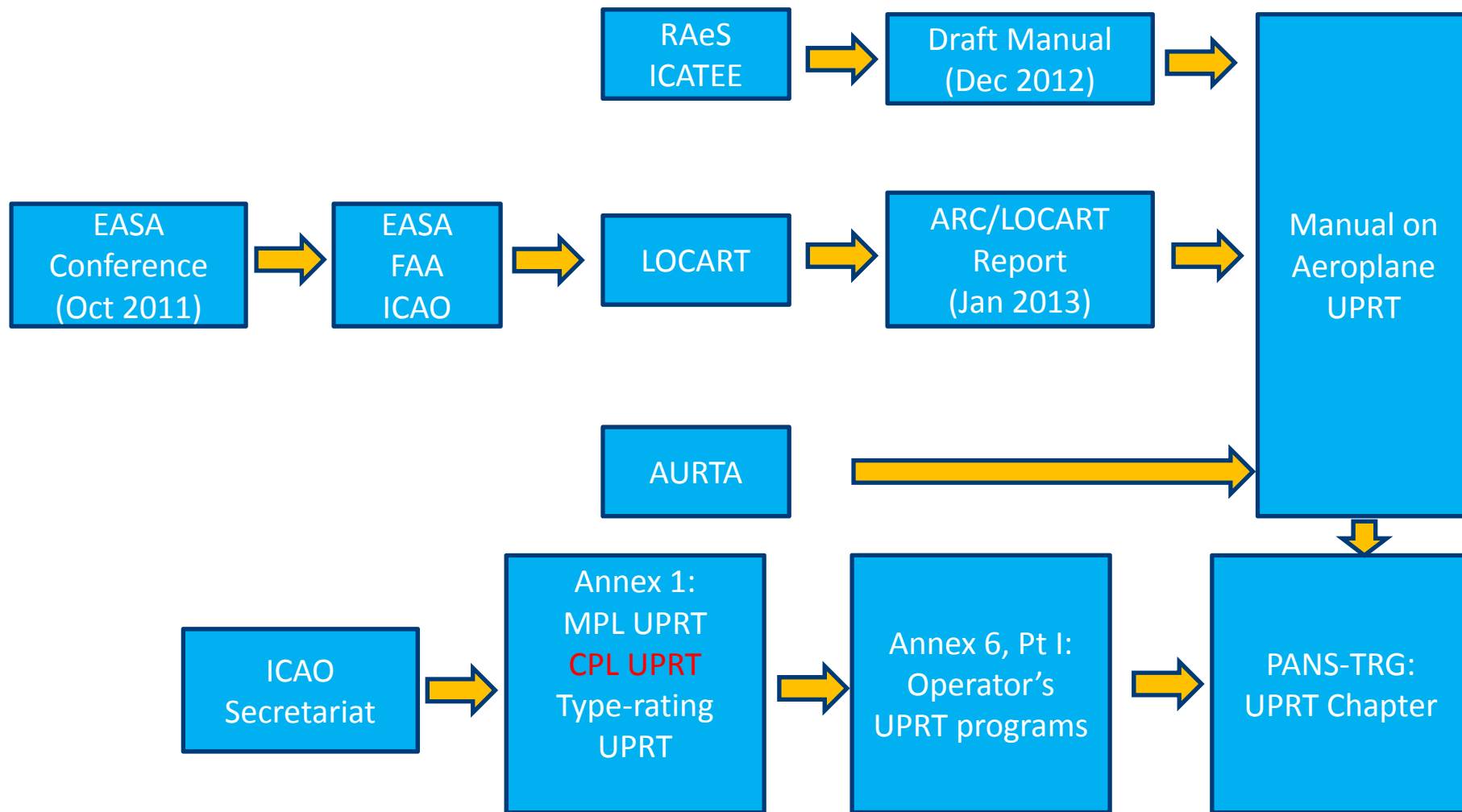


Process





Process





What do the ICAO provisions say?

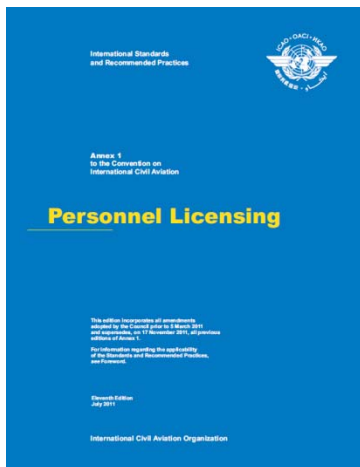


What the SARPs say:

- **Pilots must be trained in Upset Prevention and Recovery in order to meet:**
 - Commercial air transport pilot training programme requirements
 - Licensing requirements for CPL and MPL
 - MPL **must** include on-aircraft UP&RT and be conducted by an ATO
 - CPL **should** include on-aircraft UP&RT and be conducted by an ATO



ICAO UP&RT provisions



UPRT requirements for MPL and the type rating of multi-crew aeroplanes + RP for CPL



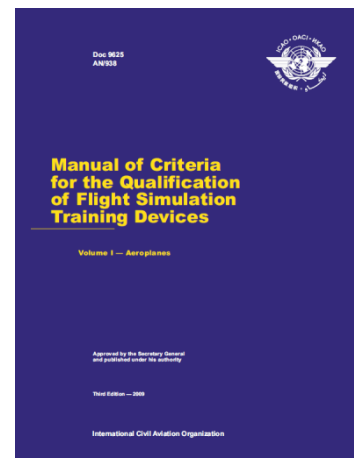
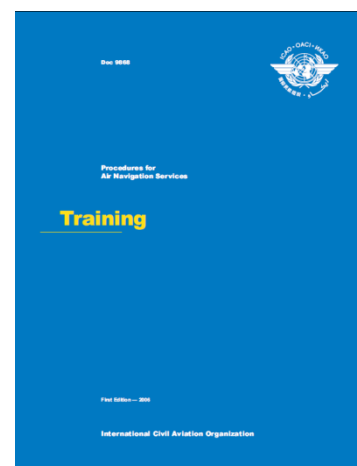
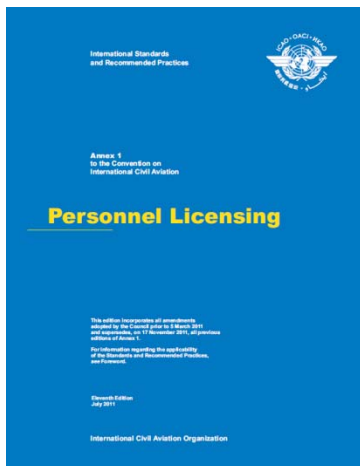
UPRT requirements for flight crew training



New Chapter to support Annex requirements



ICAO UP&RT provisions





What are the big changes?



What are the big changes?

- 1. Pilots must be trained in Upset Prevention and Recovery**



What are the big changes?

2. Pilots must be trained throughout the normal flight envelope, including the outer edges

- Approach to stall



Why not outside the envelope?

- **Potential for negative transfer of training:**
 - Out-of-envelope aircraft responses are random
 - FSTD responses do not replicate aircraft responses faithfully
 - Most current FSTD models are not programmed to go outside the envelope
- **Globally, training benefits do not outweigh safety risks**



What are the big changes?

3. UP&RT is about training not checking



What are the big changes?

4. Cost-benefit assessment

- of on-aircraft and FSTD UP&RT
- Resources and context



What are the big changes?

5. SMS considerations

- What can be done safely?



Implications:



Implications:

- **Additional theoretical training for all pilots**
- **FSTDs must be appropriately qualified for the training tasks – many FSTDs will need an update to qualify for the full range of UP&R training tasks**
- **SMS considerations - aerobatic aircraft are not the only option for delivery of on-aircraft UP&RT**
- **Instructors will need further training to meet Annex 1 authorisation requirements that are described in PANS Training**



What guidance is out there?



Manual for Upset and Recovery Training (Doc. 10011)



ICAO Training Provisions

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Upset Prevention and Recovery Training Provisions

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ICAO Standards and Recommended Practices – Upset Prevention and Recovery Training (UP&RT)

Annex 1 UP&RT excerpts (Amendment 172) :
These outline the minimum upset prevention and recovery training standards and recommended practices to meet aeroplane flight crew licensing requirements.

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Annex 6, Part I UP&RT excerpts (Amendment 38) :
These outline the minimum upset prevention and recovery training standards that international commercial air transport operators are required to implement in aeroplane flight crew training programs.

Download





ICAO Procedures for Air Navigation Services (PANS-TRG)

UP&RT excerpts in PANS-TRG (ICAO Doc. 9868) :

These identify procedures to be used by training organisations and air operators when providing upset prevention and recovery training for aeroplane flight crew.


Download



ICAO Guidance Material

Manual on Upset Prevention and Recovery Training (ICAO Doc. 10011) :
This manual provides guidance to CAAs, operators and ATOs for instituting best UP&RT practices into their training programmes, to comply with the UP&RT requirements in Annexes 1 and 6.

Download



<http://www.icao.int/Meetings/LOCI/Pages/Upset-Prevention-and-Recovery-Training-Provisions.aspx>



Airplane Upset Recovery Training Aid

- **Revision 2 to be updated**
 - By OEMs and with ICAO support
 - Covering turboprop and smaller aeroplanes
 - User-friendly format
 - Published as ICAO doc
 - Target: end of 2014
 - Free and easily accessible





Doc. 9625

- **Amendment to Doc 9625-1 – Q4 2014**



LOC-I Website



News & Events

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LOC-I Symposium



Loss of Control In-flight Symposium
20 - 22 May 2014, ICAO Headquarters, Montréal

<http://www.icao.int/meetings/LOCI/Pages/default.aspx>



Collaborative approach

- **Outcomes of LOC-I Symposium**
 - Facilitate UP&RT implementation
 - Develop implementation tools
 - Implementation assistance teams
 - Share information
 - Harmonise taxonomies and aggregate databases
 - Protect information
 - Evolve current pilot training models
 - Meet different training needs at different career points
 - Better address human performance issues
 - Access to research



ATO's or airline operators delivering UP&RT in FSTDs

- **UP&R training tasks will need to be developed**
- **Capabilities of the FSTD must fit with the UP&R training task**
- **Enhanced instructor training**
 - Can ATO's implement such programmes?



ATOs delivering on-aircraft UP&RT

- **SMS considerations**
- **Capabilities of the aircraft in use must fit with the UP&R training tasks**
- **Development of appropriate procedures and training programme in actual flight**
- **Advanced instructor training**
 - Can ATO's implement such programmes?



Airline operators

- **Bridge training required for existing pilots**
- **Introduce UP&RT into recurrent training programmes.**
- **Enhanced instructor training**
 - Can airlines implement such programmes?



CAAs

- **Enhanced inspector training**
 - UP&RT oversight requires approval of the training organization, not a trainee's individual performance (no direct testing of the trainee needed)
 - For approval purposes, inspectors must be able to assess whether the training programme can fit the qualification of the FSTDs to be used.
 - Can CAAs effectively oversee such programmes?



Questions to be answered

- **How will you assess the gaps between where you are now with training and where you need to be to implement safe and effective UP&RT?**
- **Do you need expert assistance? What sort?**
 - FSTD upgrades
 - Assessment of aeroplane capabilities for UP&RT
 - Programme development (training tasks)
 - Development of instructor qualification programmes
 - Avoidance of negative training
- **What is your timeline?**



Building a roadmap

- **Promulgation of UP&RT regulations**
 - Development of guidance
 - Development of regulations
- **Implementation of:**
 - Inspector training
 - FSTD upgrades
 - Ab initio on-aeroplane UP&RT development*
 - Type-ratings UP&RT development*
 - Airline UP&RT development*
 - Bridge training of existing pilots

* Includes Instructor training



Acronyms

- ARC – Aviation Rulemaking Committee
- ATO – Approved Training Organization
- FSTD – Flight Simulator Training Device
- ICATEE - Intl Committee for Aviation Training in Extended Envelopes
- LOCART - Loss of Control Avoidance and Recovery Training
- Royal Aeronautical Society (RAeS)
- RP - Recommended Practice
- SARPs – Standards and Recommended Practices



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