UPRT Requirements

We need to get it right when implementing UPRT.

Henry Defalque
Technical Officer, ANB - OPS
Overview

• Why do we need UPRT SARPs?
• How did we proceed?
• What do the ICAO provisions say?
• What are the big changes?
• What are the implications?
• What guidance is out there?
• Example of implementation
Why do we need UPRT SARPs?

• Mitigating loss of control in-flight accidents is an *ICAO Safety Priority*

• Upset prevention and recovery training (UPRT) for pilots is **one means to address this priority**.

• Only **aeroplane pilots** were considered
Top 3 Safety Priorities

High-Risk Accident Occurrence Categories
Percentage of all accidents 2010-2014

- Runway safety related
- Controlled flight into terrain
- Loss of control in-flight

* Accidents involving scheduled commercial air transport with maximum take-off weight exceeding 5 700 kg
How did we proceed?

• Identified training concerns:
  – **Insufficient knowledge** of high altitude aerodynamics and upset threats
  – **Wrong emphasis** on minimizing altitude loss during recovery from approach to stall
  – **Current training** concentrated in a small domain of the operational envelope
How did we proceed? - Process used

- RAeS ICATEE
- LOCART
- AURTA
- ICAO Secretariat
- Annex 1 SARP: MPL UPRT
  - CPL UPRT
  - Type-rating UPRT
- Annex 6, Part I SARP: Operator’s UPRT programs
- PANS-TRG: UPRT Chapter
- Draft Manual (Dec 2012)
- ARC/LOCART Report (Jan 2013)
- Manual on Aeroplane UPRT

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What the SARPs say:

- Pilots must be trained in upset *prevention* and recovery in order to meet:
  - Licensing requirements for CPL and MPL
    - MPL *must* receive on-aircraft UPRT to be conducted by an ATO
    - CPL *should* receive on-aircraft UPRT to be conducted by an ATO
  - Licensing requirements for multi-crew type-rating
  - Commercial air transport pilot training programme requirements

- Applicable: 13 Nov 2014
- Where?
Annex 1
UPRT requirements for MPL and the type rating of multi-crew aeroplanes + RP for CPL

Annex 6
UPRT requirements for flight crew training

PANS-TRAINING
New Chapter to support Annex requirements

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What are the big changes?

1. Pilots must be trained *throughout* the normal flight envelope (green), including the outer edges.
   - Approach to stall
   - High Altitude
What are the big changes?

1. Pilots must be trained *throughout* the normal flight envelope (green), including the outer edges.

*Why not outside the envelope?*

- Potential for negative transfer of training:
  - Out-of-envelope aircraft responses can be random
  - FSTD responses do not replicate aircraft responses faithfully
- Globally, training benefits do not outweigh safety risks
What are the big changes?

2. UPRT is about training, not checking
3. Cost-benefit assessment

- Of on-aircraft and FSTD UPRT: 210 m recurrent (yearly)
- Resources and context: 1 000 m one-time
  - Airline **bridge training** required for existing pilots
  - Instructor upgrades

- **FSTD Costs:** 80 m USD
What are the big changes?

4. Safety considerations for on-aeroplane training

  – Effective SMS
  – Qualified instructors
  – Aeroplane capabilities appropriate to the training tasks
  – Operational control procedures
Implications

• Optimise safety outcomes within available resources
Implications

• Additional theoretical training for all pilots
• Many FSTDs will need an update to qualify for the full range of UPRT tasks
• Need to balance cost/benefits for delivery of on-aircraft UPRT:
  – SMS considerations
  – Aerobatic aircraft are recommended but not the only option
• Instructors will need further training described in PANS-TRG to meet Annex 1 authorization requirements
• Bridge-training for current airline pilots
What guidance is out there?

- Manual on Aeroplane Upset Prevention and Recovery Training (Doc 10011)
- Airplane Upset Recovery Training Aid
- Manual of Criteria for the Qualification of FSTDs (Doc 9625)
Manual on Aeroplane Upset Prevention and Recovery Training (Doc 10011)

- **Introduction:**
  - Upset defined, history & applicability

- **Training programme requirements**

- **Training:**
  - Academic training
  - On-aeroplane training
  - FSTD training
    (non-type-specific and type-specific FSTD)
  - OEMs:
    - Recommendations and training scenarios
    - Upset recovery techniques
Manual on Aeroplane Upset Prevention and Recovery Training (Doc 10011)

- FSTD fidelity requirements for UPRT (see later)

- UPRT Instructors:
  - academic, on-aeroplane, FSTD

- Regulatory oversight

- Appendix:
  - Competency-based UPRT programmes
Examples of training – FSTD Manoeuvre Exercise

• See video at:
Airplane Upset Recovery Training Aid

• Revision 2 being updated
  – By OEMs and with ICAO support
  – Covering turboprop and smaller aeroplanes
  – User-friendly format
  – Published as ICAO doc
    • Target: winter 2017
  – Free and easily accessible

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Manual of Criteria for the Qualification of FSTD
*(Doc 9625)*

- 4th edition (August 2015)
- New attachment with guidance for UPRT
Manual of Criteria for the Qualification of FSTD (Doc 9625)

- UPRT instructor tools:
  - IOS

Example of instructor feedback display
Case Study: US FAA implementation

New stall and UPRT requirements in the United States

- Congressional Direction
- Aviation Rulemaking Committee (International Harmonization)
- Public Comment
- Final Rule Publication
- Education (Aviation industry/Inspectors)
Final Rule Publication

- Requires part 121 air carriers to provide stall and upset prevention and recovery training.

  - Final rule published Nov, 2013
  - Effective Jan, 2019
5 Year Implementation

• Allows time for appropriate FSTD regulatory changes and FSTD updates (modeling and new instructor tools)

• Inspector Education
  – Necessity for standardization and consistency

• Public Education
  – Necessity for setting expectations

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Take-home messages

• Effective implementation of UPRT requires considerable planning and effort by:
  – ATO’s
  – airline operators
  – CAAs

• Ineffective implementation of UPRT may result in negative safety outcomes

• UPRT = training not checking

WE NEED TO GET THIS RIGHT!
THANK YOU

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