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# Instructor Requirements for Airline UPRT

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# Overview

- ▶ Review of Current UPRT Delivery
- ▶ UPRT Flight Instructor Qualifications
- ▶ Recommendations

# Review of Current Industry UPRT Delivery

# Review of Current Industry UPRT

- ▶ Ab Initio Cadet Training – MPL UPRT
- ▶ International Airline UPRT

# Review of Current Industry UPRT

## Ab Initio

- ▶ Typically treated as an aerobatics course
- ▶ Not incorporating industry guidance (AURTA, EASA SIB 2013-02, ICAO Doc10011)
- ▶ Inappropriate integration leading to shallow or irregular learning curves
- ▶ Very little standardization of instructors

# Review of Current Industry UPRT

## Airlines

- ▶ Lack of Sim Instructor Training
- ▶ Lack of CRM
- ▶ Aggressive & violent elevator inputs (neg G)
- ▶ No discussion of proper aileron/rudder usage
- ▶ Improper analysis emphasis
- ▶ No psychological or physiological considerations

# Review of Current Industry UPRT

Conclusion:

## **Pervasive**

- ▶ Negative Training, and
- ▶ Lack of Human Factors Considerations

# UPRT Flight Instructor (FI) Qualifications

# UPRT Flight Instructor (FI) Qualifications

A qualified instructor is single greatest asset to UPRT for:

1. Delivery of necessary academic and practical training, and
2. Mitigating the risks associated with training itself.

# UPRT Flight Instructor (FI) Qualifications

*Conversely*, an unqualified instructor will become greatest liability to success of UPRT initiative.

# UPRT Flight Instructor (FI) Qualifications

Requirements for UPRT without properly identified standards could detract, rather than improve safety

# UPRT Flight Instructor (FI) Qualifications

## ICAO Doc 10011, Manual on AUPRT

- ▶ Contains guidance essential to UPRT FI qualification
- ▶ Guidance created specifically to assist in this process
- ▶ The UPRT Instructor recommendations should be followed closely

# UPRT Flight Instructor (FI) Qualifications

ICAO Doc 10011, Manual on AUPRT

Sect. 3.2.1.5

The most important factor affecting safety in the conduct of UPRT is a competent, qualified instructor within an SMS.

# UPRT Flight Instructor (FI) Qualifications

ICAO Doc 10011, Manual on AUPRT

Sect. 5.1.1

The safety implications of poor UPRT instructional technique or misleading information is more significant than in other areas of pilot training.

# UPRT Flight Instructor (FI) Qualifications

ICAO Doc 10011, Manual on AUPRT

Sect. 5.2.2.1

The unpredictable nature of UPRT trainee inputs, reactions, and behavior requires specialized expertise that cannot be acquired through routine flight operations alone.

# Pre-Training Evaluation



Eval Scenario - TP Stall

# UPRT Flight Instructor (FI) Qualifications

Why All-Attitude UPRT is so important:

- ▶ Exposure and Skill-development
- ▶ Human factors training
- ▶ This example representative of many others
- ▶ This client's reaction is normal, not unusual

# UPRT Flight Instructor (FI) Qualifications

## FI Considerations Demonstrated

- ▶ He had to expect the unexpected
- ▶ What if client put in inverted spin?
- ▶ What if client froze on the controls?
- ▶ What if exercise was done at 2100' AGL below an overcast?
- ▶ What if FI had passed out under Push-Pull effect?
- ▶ What if client had been in Normal category aircraft with 4.7 G load?

# UPRT Flight Instructor (FI) Qualifications

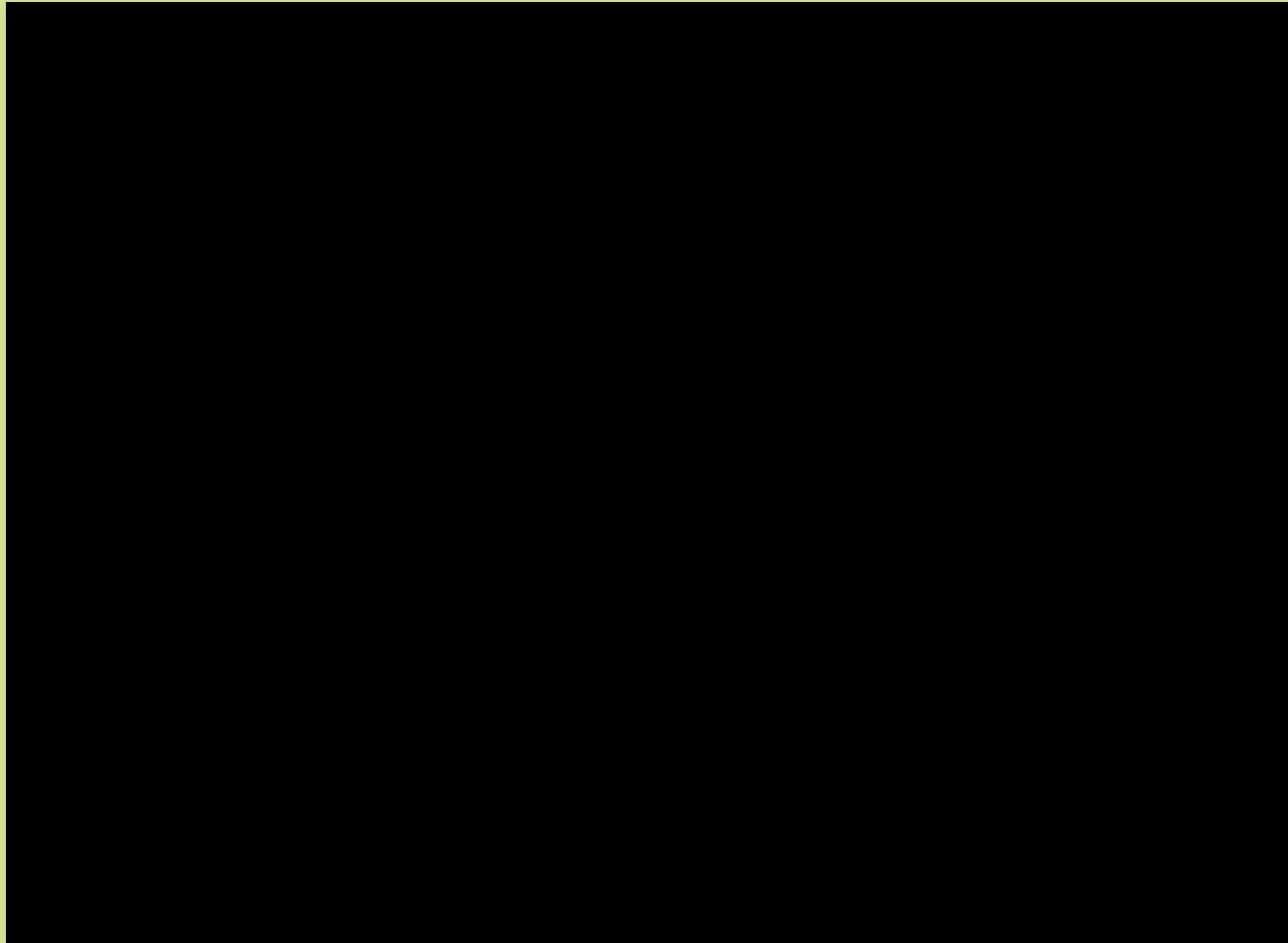
## All UPRT Instructors Must Consider:

- ▶ His training aircraft & limitations
- ▶ His own currency
- ▶ His ability to project flight path & energy state
- ▶ His ability to execute time-critical interventions of unplanned events
- ▶ His relaxed & accurate comms with student irrespective of dynamic flight/departure
- ▶ Must know psychophysiological state of student

# Real World Upset



# Russian TU-154 Spin – 22 Aug 2006



# UPRT Flight Instructor (FI) Qualifications

## Instructor Candidate Selection

### *'Raw Materials' Matter*

- ▶ Appropriately Experienced
  1. All-Attitude Experience
  2. Instructional Expertise
  3. Commercial Aviation Experience
- ▶ Properly Motivated

# UPRT Flight Instructor (FI) Qualifications

## APS FI *PRE-HIRE* REQUIREMENTS

(One UPRT Provider, but representative of several major UPRT providers in US)

- 1500 hrs. total minimum
- 500 hrs. all-attitude/all-envelope (fighter pilot, airshow/aerobatic competitor, test pilot with spin test experience)
- 200 hrs. as all-attitude/all-envelope instructor
- CFI
- ATP
- Commercial Experience (airline, corporate, gen av)

# UPRT Flight Instructor (FI) Qualifications

## APS FI Training Requirements:

- ▶ 85 hrs. of instruction (inflight & ground)
- ▶ Approximately 34 training flights
- ▶ Approximately 4 weeks of training

Note: It's not about size of aeroplane but complexity of tasks & mitigating risks

Light Aerobatic  
Aircraft



Large Transport  
Aircraft



# So how can small aircraft apply to airliners?

## Three Areas of Application:

- Aerodynamic behavior common to all fixed wing aircraft not currently presented in existing simulators due to aeromodels or fidelity limitations.
- Essential psychological and physiological human factors impact, which cannot be fully encountered in the virtual environment.
- General strategies or techniques that can be applied broadly, which are not aircraft specific.

# Aerodynamic Stall Dynamic Instability

## All Sizes and Configurations of Fixed Wing Airplanes

C-5 Galaxy Loss of Control Diego Garcia



# In-Flight Demonstration of Post-stall Lateral Instability



# Nose Low Overbank – Introduction in a Light Aerobatic Aircraft



# Nose Low Overbank – Airline Instructor in Training



**APS Airline Train-the-Trainer: High Bank**  
Restrictions: Qualified UPRT TTT IP / Validated Training Envelope



# Airline Instructor on Human Factors



**APS Reality-factor Impact on Performance**  
Restrictions: Qualified UPRT Instructor / Spins Approved Airplane



# Transfer of Flight Experience



**APS Transfer of Unload Concept**

Restrictions: Qual'd UPRT Sim Instructor / Valid Training Envelope



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# Recommendations

## Thoughts to remember:

- ▶ All-Attitude/All-Envelope Training is time-critical and life-threatening
- ▶ *But UPRT is a focused, efficient way to preserve & increase existing levels of safety*

# Recommendations

Three required areas of instructor experience vital to safe & effective delivery of UPRT:

1. Primary area of experience required is all-attitude/all-envelope domain (not normal ops).
2. Previous instructional experience.
3. Experience in flight operations outside the training environment.

# Recommendations

- ▶ Considering:
  - Volume of Information
  - Specialized Flight Skills Required
  - Enhanced Safety Required
- ▶ Strongly recommend a dedicated UPRT FI Rating
  - Compare knowledge, skills, proficiency with Multi-engine, Instrument, & Glider FI ratings

# Questions?



Thank you for having me!  
Clarke McNeace