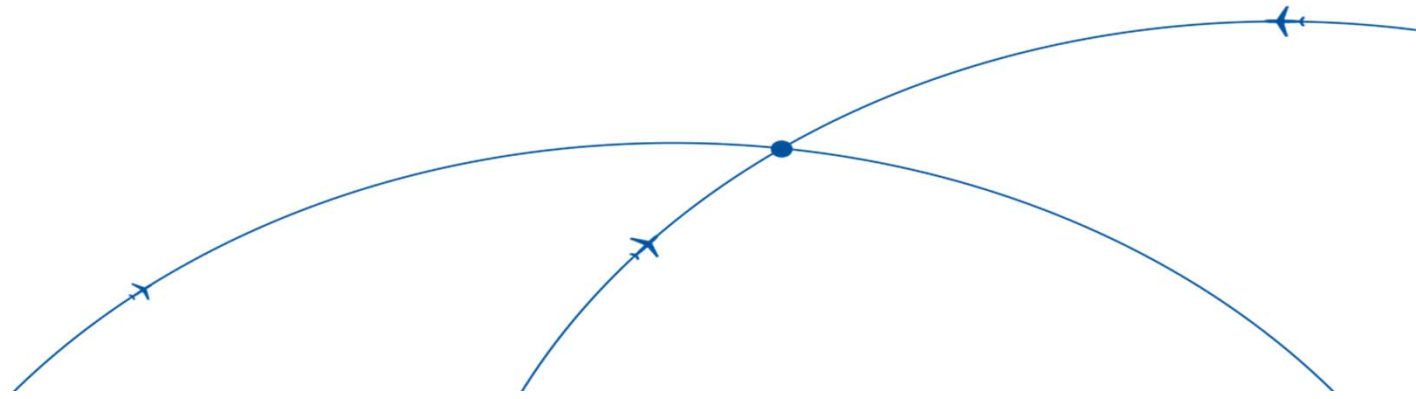




**PROGRESS MADE BY RWANDAIR IN  
IMPLEMENTING UPSET PREVENTION and  
RECOVERY TRAINING PROGRAM**





# RWANDAIR UPRT PROGRAM

1: RwandAir started its UPRT Training program in the year 2016.

- Upset Prevention and Recovery Training has been part of our pilot initial and recurrent training program since that date.
- The full training program is documented in the Company's Operations Manual Part D for all aircraft types RwandAir operates which are the A330-200/300, B737 NG 700/800, CRJ 900 and DHC-8 Q400.





## GOALS of RWANDAIR UPRT PROGRAM

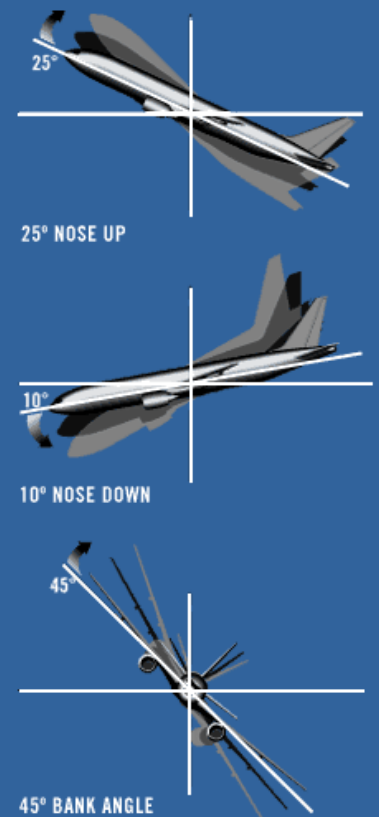
- The goals of our UPRT Program is to increase the ability of our pilots to recognize and avoid situations that can lead to airplane upsets and to improve their ability to recover control of an airplane that diverges from a crew's desired airplane state.
- Because there are an infinite number of variables that comprise upset situations RwandAir does not attempt to define testing or checking criteria.
- The ultimate goal is to avoid an upset, intervene if one is developing and regain control of the airplane .
- RwandAir is convinced that training to proficiency is the only way to achieve this goal.

# Definition of an Airplane Upset

Definition of an Airplane Upset.....

- An airplane upset is an undesired airplane state characterized by unintentional divergences from parameters normally experienced during operations.
- The upset may involve pitch and/or bank angle divergences as well as inappropriate airspeed for the conditions.

FIGURE 1. AIRPLANE UPSET CONDITIONS





# FLIGHT PATH MONITORING

## **Flight Path Monitoring**

- ❖ One of the most important factors in preventing an airplane upset is active Flight path Monitoring
- ❖ Active monitoring is the responsibility of all crew members to ensure the airplane state is understood and correct for the situation.

## **Each pilot should:**

- ❖ Know and understand the expected airplane state for the situation
- ❖ Communicate expectations
- ❖ Keep track of current airplane state
- ❖ Detect and communicate deviations from expectations
- ❖ Assess risks and decide on a response
- ❖ Update and communicate understanding
- ❖ Take timely corrective actions



# Causes of Airplane Upsets

## Causes of Airplane Upsets

An airplane upset is not a common occurrence. There are a variety of reasons why upsets occur, including

- Environmentally-induced
- Systems induced
- Pilot induced

# Causes of Airplane Upsets

## Environmentally induced

Environmental conditions that could lead to an airplane upset include

- Air mass related
- Wake turbulence

## Air Mass related include

- A. *Turbulence*
  - i. Clear Air Turbulence
  - ii. Mountain Waves
  - iii. Windshear





# Causes of Airplane Upsets

## B. Thunderstorms

- i. Air mass thunderstorms
- ii. Frontal thunderstorms
- iii. Microbursts

## C. Systems induced

### a) Flight instrument failures

Airplanes are designed to make sure pilots have at least the minimum information needed to safely control the airplane.

However past accident reports point out that pilots are not always prepared (actively monitoring) to correctly analyze the situation and an upset can develop





## Causes of Airplane Upsets

### **B. Auto Flight Systems**

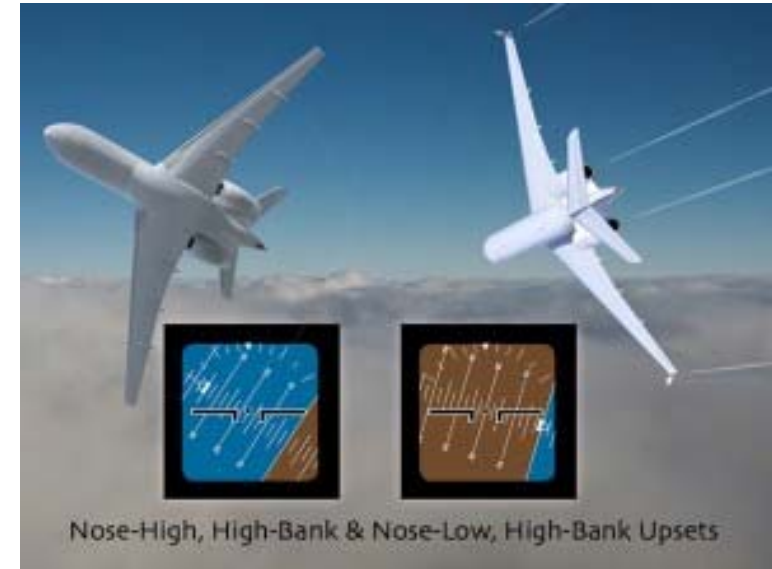
- i. As reliable as the auto flight systems have become they can still malfunction. The pilot community has tended to develop a great deal of confidence in the systems and that has led to complacency in some case. Because of the integration of systems, full analysis to determine the cause of the anomaly can be difficult for a pilot.
- ii. Pilots need to be prepared for the unexpected. (active monitoring)
- iii. Flight control anomalies, such as flap asymmetry, spoiler problems and others are addressed in the airplane operations manuals.

Unlike most system faults, flight control anomalies could require immediate action from the pilot.

# Causes of Airplane Upsets

## C. Pilot-Induced Airplane Upsets

- i. Pilots must cross-check and interpret their flight instruments. When a divergent indication exists from what was intended, it must be communicated to the other pilot and corrected with proper pitch, bank and power adjustments.
- ii. Misinterpretation of the instruments and/or lack of 'active monitoring' by the pilots can lead to an airplane upset
- iii. A pilot who is aware of the energy and flight path is less likely to be startled and therefore more likely to deal with the situation with controlled inputs versus reactive responses.





## Recovering From The Airplane Upset

Recovering from the airplane upset

Actions to recover from an upset would encompass three basic activities

- i. Asses the energy state of the airplane (become situationally aware)
- ii. Arrest the flight path divergence
- iii. Recover to a stabilized flight path.

These three activities are an integral part of every recovery from an upset.

Troubleshooting the cause of the upset is secondary to initiating the recovery. However the pilot must still recognize and confirm the situation before a recovery can be initiated. Regaining and then maintaining



## Instructors

All Airplane Upset and Recovery Training is conducted by our qualified instructors who are also Rwanda Civil Aviation Authority Designated Pilot Examiners both in the flight simulator as well as the actual airplane.

NOTE:

**RWANDAIR DOES NOT CONDUCT AUPRT IN THE ACTUAL AIRPLANE. ALL TRAINING IS DONE IN A FULLY CERTIFIED FSTD.**



## TRAINING

Every pilot employed by RwandAir completes an initial Airplane Upset and Recovery Training and Recurrent training takes place once every 12 months.

**The training consists of theoretical classroom training where pilots view a 22 minute video on UPRT as well of making extensive use of the AUPRTA application (Rev 3).**



## TOPICS COVERED IN TRAINING

The topics covered in training are

- Definition of Airplane Upset
- Monitoring
- Causes of airplane upsets:
  - i: Environmentally induced upsets
  - ii: Systems anomalies induced upsets
  - iii: Pilot induced upsets
  - iv: misuse of Airplane automation



## TOPICS COVERED IN TRAINING

- Flight Fundamentals for Pilots
  - i: Flight Dynamics
  - ii: Energy States
  - iii: Operational flight envelope
  - iv: Aerodynamics
  - v: Airplane Performance
  - vi: Icing
  - vii: Automation
  - viii: Engine Flameout



# TOPICS COVERED IN TRAINING

## Recovery From Airplane Upsets

- i: Situational Awareness of an Airplane Upset
- ii: Miscellaneous Issues associated With Upset Recovery
- iii: Airplane Upset Recovery Techniques

**Content of the RwandAir Training program is based upon ICAO Document 10011, Airbus, ATR, Boeing, Bombardier, and Embraer who have created Rev 3. of the Airplane Upset Recovery Training Aid.**

Doc 10011  
AN/506



## MANUAL ON AEROPLANE UPSET PREVENTION AND RECOVERY TRAINING

### NOTICE TO USERS

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And published under his authority

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## SAFETY MANAGEMENT

The FDM program is a non-punitive system that allows RwandAir to compare its Standard Operating Procedures (SOPs) with those actually achieved in everyday line flights. Parameter Specification for event associated with risk of LOC-I and UPRT are monitored through the FDM to include:

- Excessive roll attitude or roll rate
- Stall protection trigger
- Excessive speed / vertical speed / accelerations
- Insufficient energy at high altitude



## SAFETY MANAGEMENT

A feedback loop, which is part of a Safety Management System (SMS), allows timely corrective action to be taken where safety may be compromised by significant deviation from SOPs.

FDM involves:

- (1) capturing and analysing flight data to determine if the flight deviated from a safe operating envelope.
- (2) identifying trends; and
- (3) Promoting action to correct potential problems.



## SAFETY MANAGEMENT

Through IATA program RwandAir is able to benchmark its performance on specific safety performance indicators with the industrial standards to include LOC-I, CFIT and runway safety take off and landing SPI.

**THANK YOU!**

**MURAKOZE!**

