



Capt. Dr. Christian NORDEN

Training Policy and Development – In Service Fleet

Go Around handling

1. Introduction

Recent serious incidents involved improperly conducted Go Around maneuvers. This article will briefly describe two of these occurrences. It will then make a short number of simple and important recommendations to help avoid the re-occurrence of this critical type of events.

2. Description of incidents

2.1. First event

On a hazy morning with low patches of cloud (Vis 3000m, SCT002, BKN003), the crew conducted a manual (flight and thrust) ILS approach. The crew had no visual contact at MDA (200 ft AAL). The Captain (PF), considering a low missed approach altitude of 170ft AAL, advanced the thrust levers progressively (within 5 seconds) but stopped the action when in the FLX/MCT notch. He increased the pitch to about 6° Aircraft Nose Up. The aircraft stopped descent at 150ft RA and CONF3 was selected. 4 seconds after setting the levers in the FLEX/MCT detent, the Autopilot (A/P) was engaged and the landing gear retracted. The aircraft – still in LAND mode, due to the lack of TOGA selection – immediately conducted a rapid pitch down to regain the glide slope. PF moved the thrust levers to the CLB detent. At 127ft RA and a pitch of 3.9° Nose Down, the EGPWS audio “SINK RATE” sounded. The PF disconnected the Auto Pilot and pulled almost full back on the stick. The aircraft had reached a minimum height of 76ft RA at an airspeed of 182kts, in CONF3, gears up.

2.2. Second event

On a foggy day the crew conducted an ILS approach A/P and ATHR on. There was no contact at the minimum. The crew initiated a Go Around at a Radio Altitude of 185ft, but the thrust levers were momentarily moved only to a position just forward of, before being retarded to the FLX/MCT detent. Three seconds later the Flaps were retracted to CONF3. The Captain disconnected the Autopilot at 57ft simultaneously EGPWS “DON’T SINK” alert sounded. The aircraft reached its lowest RA of 38ft.

3. Technical considerations

On the Airbus Fly By Wire (FBW) aircraft, the common Go Around flight guidance modes of the Auto Flight System (AFS) are triggered by setting the thrust levers to TOGA. If the crew decides to go around and fails to set TOGA, the AFS status will depend on the type of approach:

- ▶ For an **ILS approach**, the A/P remains engaged in the currently selected AFS mode
- ▶ For a **managed Non Precision Approach (FINAL APP)**, the AFS remains in FINAL APP mode. Disengage the Autopilot 50 ft below minimum and revert to the basic modes (depending on Mod Status)
- ▶ For a **fully or partially selected NPA**, the A/P remains engaged in the selected mode.



Figure 1
PFD (at 140ft and 80ft) after setting MCT instead of TOGA at 200ft during an ILS approach, (symbolic graphic – no direct reproduction of the described events)

4. Recommendations

4.1. Applying TOGA in the proper way

Setting TOGA in Go Around (and in any other maneuver where maximum thrust is required instantly) should be a one-step intuitive action i.e. pushing the thrust levers rapidly up to the full forward mechanical stop. Pilots must not count the mechanical detents (clicks), like in setting thrust on Take-Off. Instructors in pilot training could emphasize this movement by the description of “firewalling it”, a term well known to most pilots from their early days of basic training. (fig. 2)

4.2. Monitoring the basic flying parameters, pitch/thrust

Airbus Golden Rule N°2 “Fly, navigate ...” applies also to the G/A phase :

Initiation of a rotation to get a positive rate of climb has priority (on the A320 for example, this translates to 15° of pitch with all engines and approximately 12,5° if one engine is out). Only then follow SRS Flight Director pitch bars orders if consistent with the intended flight path, and if the FMA has been checked.

4.3. Checking and announcing the FMA

Airbus Golden Rule N°5 requires: “Know your FMA at all times”. For the GA it means to verify that the expected mode (MAN TOGA/SRS/GA TRK or MAN TOGA/SRS/NAV) is displayed and announced immediately after the flap have been retracted one step and the flight path has been confirmed using raw data (see § 4.2).

4.4. Connecting the AP only when the FD shows the intended flight path

Before engaging the Autopilot (AP), the Flight Crew should follow the recommended practice: Fly the aircraft on the intended path, check on the FMA that the Flight Director is engaged with the appropriate modes.

4.5. Training recommendations

Academic training should ensure that crews understand that thrust levers in Airbus FBW have more than just the thrust function. They are not only used to control thrust in Manual or Auto mode, but serve also as “Mode Selectors” in certain stages of flight. The multiple additional functions of the thrust levers are for example the:

- ▶ Engaging of common modes when TOGA or FLEX (for T/O only) is set
- ▶ Sequencing of the FMS flight plan into the missed approach procedure when TOGA is set
- ▶ Retracting of the speed brakes, if extended when setting TOGA (fig. 3).



Figure 2
Thrust levers in TOGA position

“Firewall it”

Thrust Levers
are also
Mode selectors

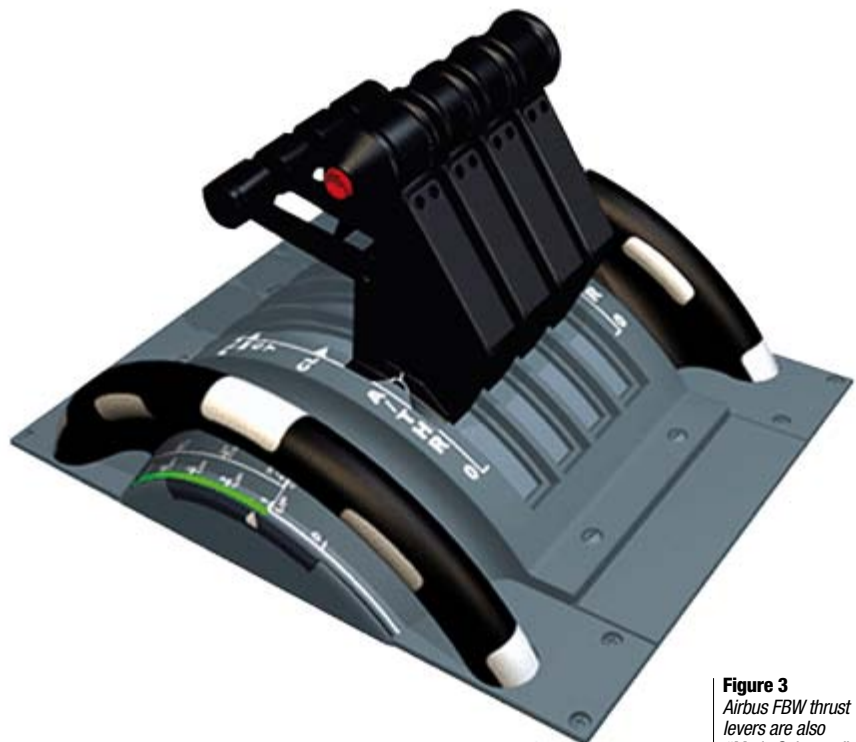


Figure 3
Airbus FBW thrust levers are also “Mode Selectors”

Safety First

The Airbus Safety Magazine

For the enhancement of safe flight through increased knowledge and communications

Safety First is published by the Flight Safety Department of Airbus. It is a source of specialist safety information for the restricted use of flight and ground crew members who fly and maintain Airbus aircraft. It is also distributed to other selected organisations.

Material for publication is obtained from multiple sources and includes selected information from the Airbus Flight Safety Confidential Reporting System, incident and accident investigation reports, system tests and flight tests. Material is also obtained from sources within the airline industry, studies and reports from government agencies and other aviation sources.

All articles in Safety First are presented for information only and are not intended to replace ICAO guidelines, standards or recommended practices, operator-mandated requirements or technical orders. The contents do not supersede any requirements mandated by the State of Registry of the Operator's aircraft or supersede or amend any Airbus type-specific AFM, AMM, FCOM, MEL documentation or any other approved documentation.

Articles may be reprinted without permission, except where copyright source is indicated, but with acknowledgement to Airbus. Where Airbus is not the author, the contents of the article do not necessarily reflect the views of Airbus, neither do they indicate Company policy.

Contributions, comment and feedback are welcome. For technical reasons the editors may be required to make editorial changes to manuscripts, however every effort will be made to preserve the intended meaning of the original. Enquiries related to this publication should be addressed to:

Airbus

Product Safety department (GS)
1, rond point Maurice Bellonte
31707 Blagnac Cedex - France
Fax: +33(0)5 61 93 44 29
safetycommunication@airbus.com



A380
Serial Number 009
Landing at Toulouse-Blagnac Airport

Safety First, #10 August 2010. Safety First is published by Airbus S.A.S., 1, rond point Maurice Bellonte, 31707 Blagnac Cedex/ France. Editor: Yannick Malinge, Vice President Flight Safety, Nils Fayaud, Director Product Safety Information. Concept Design by Airbus Multi Media Support Ref. 20100819. Computer Graphic by Quat'coul. Copyright: GSE420.0100/10. Photos copyright Airbus. Photos by ExM Company: H. Berenger, P. Masclat, H. Goussé. Printed in France by Airbus Print Centre.

© Airbus S.A.S. 2010 – All rights reserved. Confidential and proprietary documents.

By taking delivery of this Brochure (hereafter "Brochure"), you accept on behalf of your company to comply with the following guidelines:

- ▶ No other intellectual property rights are granted by the delivery of this Brochure than the right to read it, for the sole purpose of information.
- ▶ This Brochure and its content shall not be modified and its illustrations and photos shall not be reproduced without prior written consent of Airbus.
- ▶ This Brochure and the materials it contains shall not, in whole or in part, be sold, rented, or licensed to any third party subject to payment.

This Brochure contains sensitive information that is correct at the time of going to press.

This information involves a number of factors that could change over time, effecting the true public representation. Airbus assumes no obligation to update any information contained in this document or with respect to the information described herein.

Airbus S.A.S. shall assume no liability for any damage in connection with the use of this Brochure and of the materials it contains, even if Airbus S.A.S. has been advised of the likelihood of such damages.