

## Follow-up Action on Occurrence Report

*ACCIDENT TO AIRBUS A321-231, G-MEDG, AT KHARTOUM AIRPORT, SUDAN ON 11 MARCH 2007*

**CAA FACTOR NUMBER** : F36/2007  
**FACTOR PUBLICATION DATE** : 06 December 2007  
**OPERATOR** : British Mediterranean Airways  
**CAA OCCURRENCE NUMBER** : 2005/01746  
**AAIB REPORT** : AAR 5/2007

### SYNOPSIS

From AAIB Report:

The aircraft was attempting to land at Khartoum by night in conditions initially reported as blowing sand but which were in fact consistent with a forecast dust storm. Runway 36 was in use but the ILS on this runway was out of service. The commander assessed the weather conditions passed to him by ATC and believed that he was permitted, under his company's operations policy, to carry out a Managed Non-Precision Approach (MNPA) to Runway 36. The type of approach requires the autopilot to follow an approach path defined by parameters stored in the aircraft's commercially supplied Flight Management and Guidance System (FMGC) navigation database.

On the pilot's approach chart, which was also commercially supplied but from a different supplier, the final descent point was depicted at 5 nm from the threshold of Runway 36 whereas the FMGC's navigational database had been correctly updated with a recent change this position published by the Sudanese CAA which placed it at 4.4 nm from the threshold. The discrepancy amounted to a difference in descent point of 0.6 nm from the Khartoum VOR/DME beacon, the primary navigation aid for the non-precision approach.

The pilots commenced the approach with the autopilot engaged in managed modes (i.e. The approach profile being determined by the FMGC instead of pilot selections). The aircraft began its final descent 0.6 nm later than the pilots were expecting. Believing the aircraft was high on the approach, the handling pilot changed the autopilot mode in order to select an increased rate of descent. The approach became unstable and the aircraft descended through 1,000 ft agl at an abnormally high rate. The aircraft then passed through its Minimum Descent Altitude (equivalent to a height of 390 ft agl) with neither pilot having established the required visual references for landing. Instead each pilot believed, mistakenly, that the other pilot was in visual contact with the runway approach lights.

When the confusion between the two pilots became apparent, the aircraft had descended to approximately 180 ft agl and the handling pilot commenced a go-around. Between 3.4 and 5.1 seconds later, with the aircraft at a radio altitude of approximately 125 ft agl, in a position approximately 1.5 nm short of the runway, the Enhanced Ground Proximity Warning System (EGPWS) "TERRAIN AHEAD, PULL UP" audio warning was triggered. The correct emergency pull-up procedure was not followed in full, partly because the handling pilot had already initiated a go-around. The minimum recorded terrain clearance achieved during the recovering manoeuvre was 121 ft.

One further non-precision approach to Runway 36 was attempted using selected autopilot modes. The crew were attempting a third approach when they received visibility information from ATC that was below the minimum required for the approach. The aircraft when diverted to Port Sudan where it landed without further incident.

The following causal factors were identified:-

1. The pilots were unaware of a significant discrepancy between the approach parameters on the approach chart and those within the navigation database because they had not compared the two data sets before commencing the approach.
2. Confusion regarding the correct approach profile and inappropriate autopilot selections led to an unstable approach.
3. The unstable approach was continued below Minimum Descent Altitude without the landing pilot having the required visual references in sight.
4. The UK CAA's guidance and the regulatory requirements for approval to conduct MNPA were fragmented and ill-defined.
5. The operator's planning and implementation of MNPA (Managed Non-Precision Approaches) procedures included incomplete operational and written procedures and inconsistent training standards.
6. The ability of the installed EGPWS to provide sufficient warning of inappropriate terrain closure during the late stages of the approach was constrained by the lack of a direct data feed from the GPS navigation equipment.

Following this serious incident, significant safety action was taken by the operator and the UK CAA. The AAIB made four safety recommendations.

#### **FOLLOW UP ACTION**

The four Safety Recommendations made by the AAIB following their investigation are reproduced below together with the CAA's responses.

##### **Recommendation 2007-041**

Airbus should revise the expanded information "Pull up to full backstick and maintain" of the A320 Emergency Procedure for the EGPWS Alert "TERRAIN TERRAIN PULL UP" to remove any ambiguity about the amount of rearwards sidestick that should be applied.

##### **CAA Response**

This Recommendation is not addressed to the CAA.

**CAA Status - Closed**

##### **Recommendation 2007-042**

Airbus should expedite publication of guidance material relevant to flight and ground operations by Airbus aircraft types in conditions of blowing sand or low drifting sand.

##### **CAA Response**

This Recommendation is not addressed to the CAA.

**CAA Status - Closed**

##### **Recommendation 2007-044**

The European Aviation Safety Agency, in conjunction with industry, should review the current TAWS system design criteria (ETSO-C151a), and installation certification criteria, with particular emphasis on the timeliness of alerting when close to the runway. Revisions to these standards arising from this review should apply retrospectively to all aircraft currently covered by the TAWS mandate.

#### **CAA Response**

This Recommendation is not addressed to the CAA.

**CAA Status - Closed**

#### **Recommendation 2007-046**

The UK CAA should publish guidance to pilots regarding the appropriate action when faced with a conflict in approach parameters between their approach charts and an FMS database authorised for managed non-precision approaches.

#### **CAA Response**

The CAA accepts this Recommendation.

The CAA will revise Flight Operations Department Communication 20/2007 to ensure that it includes:

- a) crew procedures to be used when using the FMS for approach purposes and
- b) specific advice to pilots regarding the action they should take when faced with a conflict in approach parameters between approach charts and an FMS database.

The FODCOM will be further revised to ensure that it includes specific guidance to operators intending to conduct managed non-precision approaches, including training and operational requirements. These revisions will be completed and a revised FODCOM published by the end of January 2008.

**CAA Status - Open**