Air Accident Investigation Unit Ireland

INCIDENT REPORT
EADS Socata TBM 700N, M-SHEP
Dublin Airport (EIDW), Co. Dublin, Ireland
03 February 2011

An Roinn Iompair
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport

AAIU Report No: 2012-001
State File No: IRL00911009
Published: 16/01/2012

In accordance with the provisions of SI 460 of 2009, the Chief Inspector of Air Accidents, on 03/02/2011, appointed Thomas Moloney as the Investigator-in-Charge to carry out a Field Investigation into this Incident and prepare a Report. The sole purpose of this Investigation is the prevention of aviation Accidents and Incidents. It is not the purpose of the Investigation to apportion blame or liability.

Aircraft Type and Registration:	EADS Socata TBM 700N, M-SHEP
No. and Type of Engines:	1 x Pratt & Whitney PT6A-66D
Aircraft Serial Number:	467
Year of Manufacture:	2008
Date and Time (UTC[1]):	03 February 2011 @ 12.17 hrs
Location:	Dublin Airport (EIDW), Co. Dublin, Ireland
Type of Operation:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - 0 Passengers - 0
Nature of Damage:	Minor
Commander's Licence:	Commercial Pilot Licence (CPL) issued by the U.S. Federal Aviation Administration, validated by the Isle of Man aviation authorities
Commander's Details:	Male, aged 59 years
Commander's Flying Experience:	1,342 hours, of which 407 were on type
Notification Source:	EIDW Airport Duty Manager
Information Source:	AAIU Report Form submitted by Pilot, AAIU Field Investigation

1 UTC: Co-ordinated Universal Time. Equivalent to local time on the date of the occurrence.

SYNOPSIS

The aircraft landed on Runway (RWY) 28 at EIDW in conditions of strong and gusty crosswinds. After its initial touchdown, the aircraft became airborne again and travelled diagonally above the runway surface before it touched down on the right edge of the runway, in the area where Taxiway (TWY) E3 joins RWY 28. The propeller struck a taxiway edge light, destroying it, before the Pilot regained directional control and steered the aircraft back to the central area of the runway.

1. FACTUAL INFORMATION

1.1 History of the Flight

The aircraft departed from Guernsey Airport (EGJB) for a non-stop private flight to EIDW. The Pilot stated that he had originally intended to fly into Weston Airport, but that customs regulations required an arrival into EIDW. The Pilot stated that he had received the weather forecast for EIDW before departure and that he was aware that he would encounter strong winds on arrival.

The Pilot reported that he received good service including weather updates from Dublin Air Traffic Control (ATC) whilst en route. Following a change of radio frequency to Dublin Tower when M-SHEP was 5.7 nm[2] from the touchdown point of RWY 28, the Tower controller provided five wind checks to the aircraft during its final approach.

The aircraft initially touched down on the centre-line of RWY 28. However, within a few seconds it became airborne again and it drifted diagonally across and above the runway to the right.

The aircraft landed back on the right hand edge of RWY 28 in the area where TWY E3 meets RWY 28. The propeller struck a blue TWY E3 light, destroying it. The Pilot then regained directional control and steered the aircraft through the area between the pavement edge and the taxiway/ runway edge lighting and then back onto the central area of the runway, **(Photo No. 1).** Subsequently, the aircraft taxied slowly off RWY 28 via TWY E5 and the B taxiways to the light aircraft park.

Photo No. 1: Aircraft track between edge lighting and runway edge

2 **Nm:** nautical miles

The initial notification of the Incident to the Tower controller was made by the crew of an aircraft which was cleared to line up and wait on RWY 28 after M-SHEP had landed. An A320 aircraft which was on approach behind M-SHEP was instructed to go around and thereafter flight operations were changed to RWY 16. RWY 28 was handed back for operational use at 13.25 hrs, although flight operations continued on RWY 16 until 18.45 hrs.

1.2 Interview with Pilot

The Pilot informed the Investigation that this was his first visit to EIDW although he had gained much of his experience flying the aircraft to varied destinations within Europe.

He stated that while he felt that the conditions were *"a bit rough"* during the approach, they didn't seem to be any worse down to the point of touchdown than conditions he had experienced before. He stated that, while a lot of control input was required during the final approach, at no time did he feel that the aircraft was getting away from him or that it was being pushed off the centre-line. At the time that he straightened it up for landing and the aircraft initially touched down, it was on the runway centre-line.

The Pilot reported that he touched on satisfactorily, port wheel first at approximately 65 kts, and that he was about to retract the flaps because the aircraft type has a very large full landing flap. However, at that moment the aircraft was *"picked up off the runway"* by a gust to what the Pilot felt was 10 feet into the air. He described how the air was not smooth and that it felt to him as if the aircraft was going to be thrown back onto the ground. He pulled the control column back and did not apply any power. He described doing his utmost to keep the nose in the air and to maintain directional control with the rudder pedals. He considered that he was not in a viable go-around situation as the aircraft was not travelling in a stable direction, and that *"the wind had us, we didn't have it"*.

The Pilot estimated that the aircraft had lost a maximum of 10 kts on the runway before the effect of the gust which lifted it back into the air. He thought that the wings had remained reasonably level throughout the incident. He described how he had attempted to hold the nose up and the wings level *"until the aircraft arrived where it wanted to arrive"*. He also considered that *"he wasn't really in charge of its direction"* during the incident. He described how the aircraft was *"deposited fairly firmly towards the right hand side of the runway"*.

1.3 Aircraft Information

The TBM 700N (also known as the TBM 850) is a single-engined, six-seat business turboprop aircraft. It is powered by a nose-mounted PT6A-66D engine driving a Hartzell propeller, incorporating four blades manufactured from an aluminium alloy. The engine is flat-rated at 850 shp[3] although it is limited to 700 shp for take-off and landing. The aircraft is fitted with a retractable tricycle undercarriage.

1.4 Damage to Aircraft

One of the four propeller blade tips exhibited a tear approximately 2 cm in length, while all four blade tips had been scored by contact with a hard surface. The Pilot informed the Investigation that the reduction gearbox oil filter and chip detector were subsequently checked in accordance with the engine manufacturer's maintenance manual procedure for a propeller strike at flight idle power and no issues were identified. The aircraft departed EIDW five days after the Incident, following repairs.

3 **shp**: shaft horsepower

1.5 Meteorological Information

1.5.1 Aftercast

Met Éireann were requested to provide an aftercast of the meteorological conditions for the time of the Incident.

The aftercast stated that an active depression of 971 hPa[4] centred at approximately N58° W016° was driving a strong and gusty southwesterly flow across Ireland. The wind at surface level at the time of the Incident was recorded as being 220°, 22 kts gusting to 33 kts. The aftercast noted that the anemometer trace for the relevant time period showed a gust at the exact, or very close to the exact, time of the incident. It also noted that moderate low level turbulence would also be very likely due to the strong surface and gradient level winds.

1.5.2 Wind Checks issued by ATC

As the aircraft flew its final approach to land on RWY 28, the Tower controller issued five wind checks to M-SHEP. At 12.13:39 hrs, following initial contact with the Tower, M-SHEP received a wind check of 210°, 20 kts, gusting 31 minimum 10. The next check, 1 minute and 10 seconds later, accompanied the landing clearance and was 210°, 21 kts, gusting 31 minimum 10. Three further wind checks were issued over the next minute and 20 seconds, 210°, 21 kts, gusting 31 minimum 10, 210°, 20 kts, gusting 31 minimum 10 and finally 200°, 21 kts, gusting 31 minimum 10. A wind check issued to the next aircraft on approach approximately a minute and a half after the incident was 210°, 24 kts, gusting 33 minimum 10.

1.5.3 Preceding Aircraft

An Airbus A320, which was the aircraft ahead of M-SHEP in the approach sequence to RWY 28, performed a go-around "due to weather" approximately six minutes before M-SHEP's landing. This occurred before M-SHEP changed onto Tower frequency and consequently the Pilot was unaware of this go-around.

1.6 Aircraft Crosswind Performance

Following the Incident, the Investigation requested details regarding crosswind limitations from the aircraft manufacturers. The relevant extract from the Pilot's Operating Handbook (POH), Section 5.7 Wind Components, is attached at **Appendix A**. This shows that the demonstrated crosswind for the aircraft type is 20 kts.

Figure 5.7.1 of the POH illustrates that a wind gust of 30 kts from a direction of 210°, i.e. an angle of 70° between the wind direction and the orientation of RWY 28, has a headwind component of 10 kts and a crosswind component of 28 kts.

4 **hPa**: hectoPascal, a unit of atmospheric pressure

2. ANALYSIS

The Pilot was attempting a landing in what were very challenging gusty crosswind conditions. Gusts of 30 kts and higher from directions between 200° and 220° contained crosswind components in excess of the demonstrated crosswind performance of 20 kts set out in the POH. Although the Pilot was reasonably experienced on type, the Incident serves to demonstrate that attempting to land in conditions that exceed manufacturer's guidance is unwise.

It seems likely that a severe gust, as recorded on the anemometer trace, caught M-SHEP just after its initial touch-down and the aircraft became airborne again. The aircraft travelled diagonally above the runway surface before touching down again on the right hand side of the pavement within a few meters of the grass verge. While the Pilot at that stage regained directional control, he was unable to prevent the propeller from striking a taxiway light. Thereafter, he was able to steer the aircraft away from the runway edge while avoiding the other taxiway and runway edge lights in his vicinity.

The Pilot was unaware that the preceding heavier aircraft, which made an approach six minutes earlier, had performed a go-around due to the conditions. Had he been made aware of this fact, then it may have prompted him to re-assess his own approach to RWY 28. However, the wind direction of 200° to 220° meant that significant crosswinds would also have been encountered on the alternative runway available at EIDW, RWY 16.

The Investigation considers that, in cases such as this where an aircraft performs a go-around due to adverse environmental conditions or for other reasons, it should be standard ATC procedure that the following aircraft should be informed of the preceding go-around, and if ATC is aware of the reason(s) for the go-around, then those reasons should be passed to the following aircraft. Accordingly, a Safety Recommendation is issued to the Irish Aviation Authority.

3. CONCLUSIONS

(a) Findings

1. The aircraft made an approach and landing on RWY 28 in wind conditions where gusts exceeded the demonstrated crosswind performance for the aircraft type.

2. After initial touch-down, directional control was lost when a gust lifted the aircraft off the runway surface and carried it across the runway to the right.

3. The aircraft touched down again on the pavement in the area where TWY E3 meets RWY 28, where the propeller struck a taxiway edge light, destroying it.

4. The Pilot regained ground directional control and steered the aircraft through an area between the pavement edge and the runway and taxiway edge lighting before bringing the aircraft back into the central part of the runway.

5. The Pilot was unaware that the aircraft preceding M-SHEP in the approach sequence performed a go-around due to the prevailing conditions.

(b) Probable Cause

A landing was attempted in crosswind conditions in which the gusts exceeded the demonstrated crosswind performance of the aircraft.

(c) Contributory Factor(s)

The Pilot was unaware that the preceding aircraft had performed a go-around due to the prevailing wind conditions.

4. SAFETY RECOMMENDATION

It is recommended that the Irish Aviation Authority should consider the introduction of a standard ATC procedure whereby, if an aircraft performs a go-around, the following aircraft should be informed of that go-around as well as the reason(s) for the go-around when known to ATC. **(IRLD2012001)**

- END -

APPENDIX A

TBM

_850_ PILOT'S OPERATING HANDBOOK

SECTION 5
PERFORMANCE

5.7 - WIND COMPONENTS

EXAMPLE: Angle between wind direction and flight path : 50°
Headwind : 8 kts
Crosswind : 10 kts
Wind Speed : 15 kts

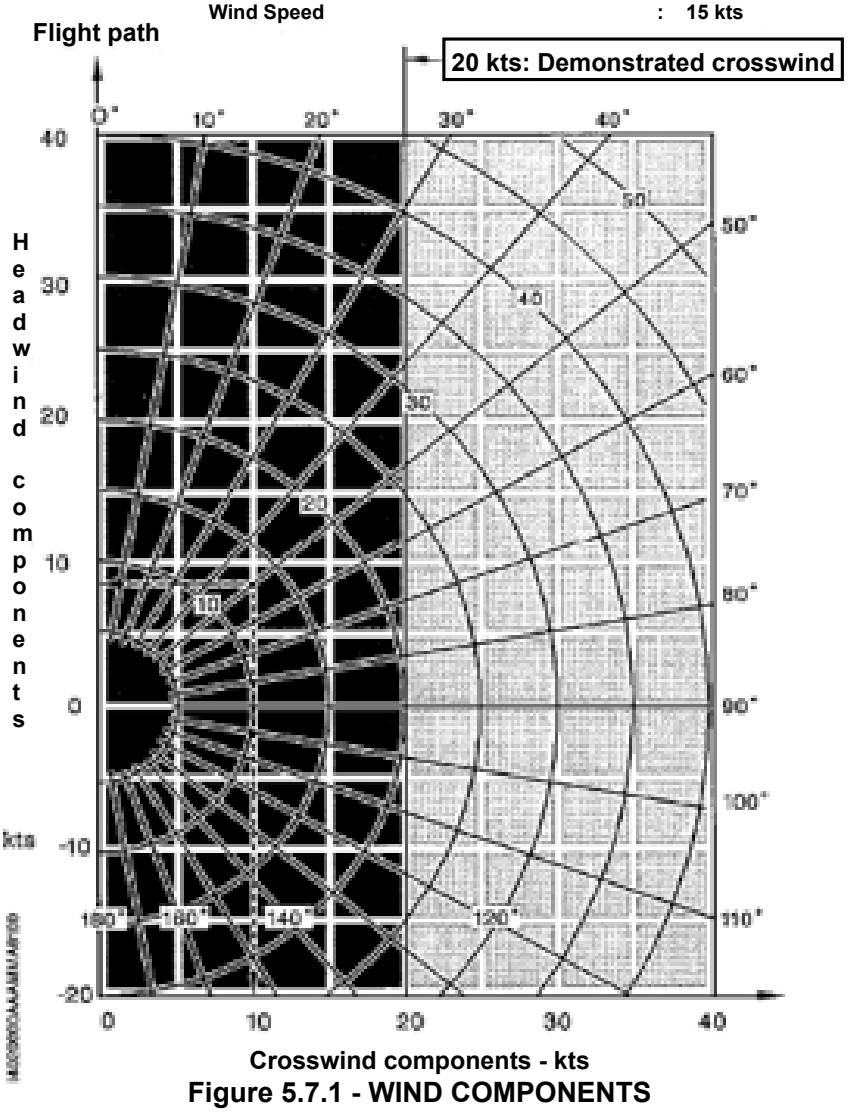

Figure 5.7.1 - WIND COMPONENTS

Edition 1 - June 22, 2007
Rev. 0

Page 5.7.1

Extract from TBM 700N Pilot's Operating Handbook

In accordance with Annex 13 to the International Civil Aviation Organisation Convention, Regulation (EU) No 996/2010, and Statutory Instrument No. 460 of 2009, AIR NAVIGATION (NOTIFICATION AND INVESTIGATION OF ACCIDENTS, SERIOUS INCIDENTS AND INCIDENTS) REGULATION, 2009, the sole purpose of these investigations is to prevent aviation accidents and serious incidents. It is not the purpose of any such accident investigation and the associated investigation report to apportion blame or liability.

A safety recommendation shall in no case create a presumption of blame or liability for an occurrence.

Produced by the Air Accident Investigation Unit

AAIU Reports are available on the internet www.aaiu.ie

An Roinn Iompair Turasóireachta agus Spóirt

Department of Transport, Tourism and Sport

A.A.I.U.,
Department of Transport Tourism and Sport,
2nd Floor, Leeson Lane,
Dublin 2, Ireland.
Tel (24x7): *+353 1 604 1293 or*
+353 1 241 1777
Fax: *+353 1 604 1514*
Email: *info@aaiu.ie*
Web: *www.aaiu.ie*