



# Air Accident Investigation Unit Ireland

**PRELIMINARY ACCIDENT REPORT  
SA-227-BC Metro III, EC-ITP,  
Cork Airport, Ireland  
10 February 2011**



*Department of Transport*  
*An Roinn Iompair*



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## PRELIMINARY ACCIDENT REPORT

This is preliminary information, subject to change, and may contain errors. Any errors in this Report will be corrected in the Final 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. This Preliminary Report contains factual information, as known at this time, and does not contain any analysis or conclusions.

1. AIRCRAFT MANUFACTURER: Fairchild Aircraft Corporation  
Model: SA-227-BC Metro III  
State of Registry: Spain  
Registration: EC-ITP  
Serial Number: BC-789B  
Year of Manufacture: 1992
2. TYPE OF OPERATION: Scheduled Public Transport
3. DATE / TIME: 10 February 2011 at 09.50 hrs UTC
4. POSITION OF OCCURRENCE: Cork Airport, Co. Cork, Ireland
5. PERSONS ON BOARD: Crew: 2 Passengers: 10
6. INJURIES: Crew: 2 (Fatal) Passengers: 4 (Fatal)  
6 (Injured)
7. DAMAGE: Aircraft destroyed
8. INVESTIGATOR-IN-CHARGE: Leo Murray



## INTRODUCTION

This Investigation is being conducted in accordance with the requirements of ICAO Annex 13, Regulation (EU) 996/2010 and Irish Regulations S.I. 460 of 2009. The following States appointed Accredited Representatives and Advisors to the Investigation: United Kingdom (AAIB), United States (NTSB), Spain (CIAIAC) and Israel (AIAI). The European Aviation Safety Agency (EASA) and the Irish Aviation Authority (IAA) also appointed Advisors.

### 1. GENERAL

The aircraft was operating on an international scheduled air service between Belfast City Airport (EGAC) and Cork Airport (EICK). The operation of the flight involved three separate undertakings; a Spanish holder of an Air Operators Certificate (AOC) that operated the flight, a Ticket Seller based in the Isle of Man, and a second Spanish company that supplied the aircraft and flight crew under an agreement with the Ticket Seller. The Ticket Seller held a Tour Operator's Licence issued by the Irish Commission for Aviation Regulation.

### 2. PRECISION INSTRUMENT APPROACHES AT EICK

Cork Airport is equipped with Instrument Landing System (ILS) approaches on the main Runway (RWY) 17/35 incorporating Distance Measuring Equipment (DME). Approach lighting, runway lighting and Runway Visual Range (RVR)<sup>1</sup> transmissometers are installed on both runways. The ILS equipment provides precision guidance for carrying out instrument approaches using localiser and glideslope radio transmissions.

On RWY 17, a CAT II approach is available to suitably equipped aircraft flown by appropriately qualified flight crew; a CAT I approach is also available to higher minima. On RWY 35, a CAT I approach is available. The following minima are applicable:

Runway	Category (CAT)	Decision Height (DH) <sup>2</sup>	Minimum RVR (Touchdown)
17	II	100 ft	300 metres (m)
17	I	200 ft	550 m
35	I	200 ft	750 m

EC-ITP was not equipped with an autopilot nor was it equipped with a flight director, and the aircraft had to be flown manually. The AOC contained approval for the aircraft to operate CAT I approaches only. European Commission Regulation (EC) No 859/2008, entitled 'Common technical requirements and administrative procedures applicable to commercial transportation by aeroplane' sets out the applicable rules concerning commencement and continuation of instrument approaches in Section OPS 1.405.

<sup>1</sup> **RVR:** Runway Visual Range is measured by transmissometers at touchdown, midpoint and stop-end. Also known as Instrument Runway Visual Range (IRVR).

<sup>2</sup> **DH:** In a precision approach, the height above the runway threshold at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

### 3. HISTORY OF THE FLIGHT

On the night of 9/10 February 2011, the aircraft operated a night mail service in the UK. These flight sectors were operated by a different flight crew to the crew involved in the accident. The accident Flight Crew, which consisted of a commander and co-pilot, commenced duty at Belfast Aldergrove Airport (EGAA) in the early morning of the 10 February 2011. The empty aircraft departed from EGAA at 06.40 hrs on a short positioning flight to EGAC, where it arrived on stand at 07.15 hrs. Following a fuel uplift at EGAC a total fuel quantity of 3,000 lbs was recorded, which was sufficient for the planned round trip to EICK and back to EGAC. The flight plan specified Waterford Airport (EIWF) as the alternate for the sector to EICK. A total of ten passengers boarded the aircraft.

The accident flight took off from EGAC at 08.10 hrs, and climbed to Flight Level (FL) 120. The Aircraft Technical Log indicated that the Co-pilot was Pilot Flying<sup>3</sup> (PF) with the Commander acting as Pilot Non Flying<sup>4</sup> (PNF). No cabin crew were carried on the flight, nor were they required by regulation due to the size of the aircraft. The required passenger safety briefing was given prior to the flight by the Flight Crew.

The flight was handed over to Shannon Air Traffic Control at 08.34 hrs. At 08.48 hrs the flight contacted Cork Approach Control. The Cork ATIS<sup>5</sup> information stated that RWY 35 was the active runway with Low Visibility Procedures (LVP) in operation. Cork Approach also informed the Flight Crew that RWY 35 was the active runway with CAT II available for RWY 17. The RVRs on RWY 17 were passed by Cork Approach to EC-ITP as 300 m (touchdown), 350 m (midpoint) and 550 m (stop-end) (300/350/550). EC-ITP was given the choice of runways, and while RWY 35 was initially considered by the Flight Crew, a decision was made to opt for an approach to RWY 17. This was acknowledged by Cork Approach who stated *'[Callsign] that's copied, just check IRVRs Runway 17 for CAT II, currently at 350, 350, and 450.'*

The aircraft first established on the ILS approach to RWY 17 at 08.58 hrs and was handed over to Cork Tower. The RVRs passed by Cork Tower at 09.00 hrs were 300/400/375. The approach was continued beyond the 3.5 nautical miles (nm) DME point (outer marker equivalent). A missed approach was carried out at 09.03 hrs, the lowest height recorded by TAWS<sup>6</sup> on this approach was 101 ft RADALT<sup>7</sup>.

A second ILS approach was then flown, to the reciprocal direction RWY 35, with the aircraft being handed over to Cork Tower at 09.10:45 hrs at 8 nm from touchdown. At 09.10:56 hrs the Flight Crew reported established on the ILS RWY 35. The RVRs passed by the Tower at this time were 350/350/350. Descent was continued beyond the 4.9 nm DME point (outer marker equivalent). A missed approach was carried out at 09.14 hrs, the lowest height recorded by TAWS on this approach was 91 ft RADALT.

3 **Pilot Flying:** Pilot handling the flight controls.

4 **Pilot Non Flying:** Pilot carrying out other tasks, sometimes referred to Pilot Monitoring (PM).

5 **ATIS:** Automated Terminal Information Service.

6 **TAWS:** Terrain Awareness Warning System (on-board equipment providing certain aural warnings and height callouts to the flight crew)

7 **RADALT:** Radio Altimeter (on-board equipment measuring aircraft height above ground).



At 09.15 hrs the Flight Crew requested to enter a holding pattern for 15 to 20 minutes to see if the weather would improve. The flight took up the holding pattern at point ROVAL<sup>8</sup> maintaining an altitude of 3,000 ft. The Flight Crew requested the weather for Waterford. This weather, which was below minima, was provided by Cork Approach. The Flight Crew nominated Shannon Airport as their second alternate and requested weather information. Shannon weather was passed by Cork Approach, it was below minima. Weather for Dublin Airport was then sought by the Flight Crew. This was acknowledged by Cork Approach who offered to provide the weather for Kerry Airport also. The weather at Kerry was passed with the visibility being reported as greater than 10 kilometres. Weather conditions at Dublin, which were marginal, were obtained and passed to the Flight Crew at 09.35 hrs.

At approximately 09.32 hrs, with EC-ITP still in the ROVAL hold, the RVR values on RWY 17 at Cork began to improve. Following a further improvement to 500/450/400 at 09.39 hrs, the Flight Crew elected to attempt another approach to RWY 17. Commencement of a third approach is not prohibited by regulation. The Investigation has not yet confirmed if the operator's Standard Operating Procedures (SOPs) address this issue.

At 09.45:22 hrs the aircraft reported established on the ILS, and was configured with landing gear down and ½ flaps selected. At 09.45:26 hrs, when EC-ITP was at 11 nm DME on the ILS, the RVR (touchdown) improved to 550 m, which was passed to the Flight Crew by Cork Approach.

At 09.45:38 hrs, the flight was handed over to the Cork Tower and the Flight Crew reported to the Tower at 09.46:00 hrs passing 9 nm DME. The final RVRs passed to EC-ITP at 09.46:15 hrs were 500/400/400 when the recorded TAWS position of the aircraft was 9.6 nm from the threshold of RWY 17. ATC procedures require that only changes to RVR values are transmitted to aircraft at this stage of an approach. At approximately 400 ft RADALT, recorded data shows the aircraft deviated to the right of the runway centreline, paralleling the centreline track.

The descent was continued below DH. Power was reduced momentarily before being re-applied. Co-incident with the re-application of power, an aural warning tone activated and sounded continuously for seven seconds until the Cockpit Voice Recorder (CVR) ceased recording.

Just below 100 ft RADALT, a go-around was called by the PNF and was acknowledged by the PF. Recorded data shows that the aircraft rolled significantly to the left as the aircraft tracked towards the runway centreline. This was immediately followed by a rapid roll to the right which brought the right wingtip into contact with the runway surface. Runway surface contact was made with a roll angle of 97 degrees to the right. The initial impact mark was located 86 m from the runway threshold, and 2 m left of the centreline.

The aircraft continued to roll rapidly to the right and struck the runway in the fully inverted position 25 m beyond the initial impact point. The inverted aircraft departed the runway surface on a heading of approximately 195° M and came to a rest 189 m from the initial impact point. The propeller blades on both engines were severely damaged; three of the four propeller blades on the right-hand engine detached during the inverted impact. Fire occurred in both engines post impact.

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8 ROVAL: Reporting point on the RWY 17 ILS at 7.9 nm DME.

The following table reflects the approximate timing and sequence of audible events during the final seventeen seconds of the CVR recording:

Time to end of recording (Sec)	Source	Audible events
17	TAWS	<b>'Three hundred'</b>
15	TAWS	<b>'Minimums, Minimums'</b>
13	PNF	<i>'Ok, minimum... continue'</i>
11	TAWS	<b>'Two hundred'</b>
10	PF	<i>'Ok'</i>
9	CVR	Engine power reduction*
7	CVR	Engine power increase*
7	CVR	Warning tone begins
5	TAWS	<b>'One hundred'</b>
4	PNF	<i>'Go-around'</i>
4	PF	<i>'... round'</i>
4	TAWS	<b>'Fifty'</b>
2	TAWS	<b>'Forty'</b>
2	Crew	Exclamation
0	CVR	End of Recording

\* Confirmed by Flight Data Recorder (FDR) data.

#### 4. ACCIDENT RESPONSE

Cork Tower promptly sounded the crash alarm and the Airport Fire Service (AFS) rapidly located the wreckage despite poor visibility. The AFS extinguished the engine fires, thereby preventing fire reaching the fuselage. Local Authority Emergency Services also attended in accordance with the Regional Major Emergency Plan, which was activated. The two Flight Crew and four passengers were fatally injured. Six passengers were rescued and brought to hospital. Four of these passengers suffered serious injuries.



## 5. ADDITIONAL INFORMATION

The FDR and CVR were both recovered on the day of the accident. Data from these devices was downloaded the following day; work on analysis of the FDR data is continuing.

At this time the Investigation has not identified any failures of the airframe, systems or powerplants during the flight. The aural warning that sounded during the last seven seconds of the CVR recording is believed to be the stall warning horn, although this has not been definitively established to date.

No deficiencies in the relevant airfield infrastructure have been identified to date. In particular the ILS was operating normally on the morning of the accident. It was flight checked on the day following the accident and was serviceable.

The factors which resulted in the loss of control are being examined. The engines and propellers have been sent to appropriate facilities for examination, under the supervision of the Investigation. The maintenance history of the aircraft is also being studied.

The experience of both Flight Crew members is being examined, as the Commander was newly promoted and the First Officer had recently joined the operation. The flight crew training, operational procedures and oversight are also being examined.

The Investigation is examining, inter alia, the operational aspects of the flight including operational control and regulatory oversight. This will include the examination of the relationships between the AOC holder, the undertaking selling the service (Ticket Seller), and the undertaking which supplied the aircraft and Flight Crew.

The Investigation is on-going and a Final Report will be published in due course.

- END -

**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

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