



Air Accident Investigation Unit Ireland

SYNOPTIC REPORT

INCIDENT

**Avions de Transport Régional
ATR 72-202, EI-FXG
Shannon Airport
26 February 2014**



**An Roinn Iompair
Turasóireachta agus Spóirt**

Department of Transport,
Tourism and Sport

FINAL REPORT

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13¹ to the Convention on International Civil Aviation, Regulation (EU) No 996/2010² of the European Parliament and the Council, and Statutory Instrument No. 460 of 2009³, safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

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¹ **ICAO Annex 13:** International Civil Aviation Organization, Annex 13 to the Convention on International Civil Aviation, Air Accident and Incident Investigation.

² **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.

³ **Statutory Instrument (SI) No. 460 of 2009:** Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.



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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI 460 of 2009, the Chief Inspector of Air Accidents, on 26 February 2014, appointed Mr Leo Murray as the Investigator-in-Charge to carry out an Investigation into this Incident and prepare a Report.

Aircraft Type and Registration:	ATR 72-202, EI-FXG
No. and Type of Engines:	2 x Pratt & Whitney PW 124B
Aircraft Serial Number:	224
Year of Manufacture:	1991
Date and Time (UTC⁴):	26 February 2014 @ 19.42 hrs
Location:	Shannon Airport (EINN)
Type of Operation:	Public Transport – Cargo
Persons on Board:	Crew - 2
Injuries:	Crew - Nil
Nature of Damage:	Minor
Commander's Licence:	Airline Transport Pilot Licence (Aeroplanes) issued by the Irish Aviation Authority (IAA)
Commander's Details:	Male, aged 60 years
Commander's Flying Experience:	10,730 hours, of which 6,240 were on type
Notification Source:	Flight Safety Manager (Operator)
Information Source:	AAIU Investigation and AAIU Report Form submitted by the Commander

⁴ UTC: Coordinated Universal Time, coincident with local time on 26 February 2014.

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SYNOPSIS

The aircraft was operating a multi-sector cargo rotation, with the first sector from Shannon Airport (EINN) to Cork Airport (EICK). After its earlier arrival at EINN, the aircraft was parked adjacent to the east apron hangar where loading took place. Following engine start, the aircraft commenced its taxi with a slight right turn towards the lead-out line to the taxiway. During the turn, while under marshaller's instructions, the left wing-tip came into contact with the hangar cladding. No persons were injured. Although the aircraft carried a small quantity of dangerous goods, they posed no hazard as a result of the impact. The parking area used at EINN was not suitable for an ATR 72 as this is a larger aircraft than the ATR 42 which was normally used for this operation.

1. FACTUAL INFORMATION**1.1 History of the Flight**

EI-FXG was the designated 'hot-spare'⁵ aircraft and was positioned from EICK to EINN in the early hours of 26 February 2014 to conduct the scheduled operation from EINN later that day. The Air Traffic Control (ATC) repetitive flight plan indicated that the aircraft was an ATR 42-300. As a new flight plan was not filed to reflect the use of an ATR 72, ATC was unaware of the variant change and cleared the aircraft to proceed to the area adjacent to the East Apron hangar, where the ATR 42 is normally parked. The aircraft was shut down short of the parking area and towed into its final parking position facing out for its subsequent departure later that evening.

3

The aircraft was scheduled to complete a multi-sector cargo flight to Paris Charles de Gaulle (LFPG) from EINN, operating through EICK on the outbound and return legs. The two Flight Crew members were the only occupants on board and the Commander carried out the external pre-flight inspection before boarding the aircraft for the first sector to EICK. He described the conditions at the time as '*dark with blustery rain*'. The Commander had used the airport on previous occasions but did not operate there routinely. He was unaware of the prohibition of the use of the stand by an ATR 72 and was also unaware of the limited wing-tip clearance afforded.

To facilitate manoeuvring near the hangar, a marshaller was positioned to the front of the aircraft who was assisted by a wingman standing near the left wing-tip. Following routine engine start, the Ground Power Unit (GPU) and chocks were removed. Due to the parking position of the aircraft, it was necessary to turn right as soon as possible to follow the offset lead-out line to join the short taxiway directly in front of the hangar. As the Commander commenced taxi, ATC queried if the Flight Crew had received the latest weather SIGMET⁶. As the weather was poor, the Commander requested the Co-Pilot to note the SIGMET, which was read out by ATC.

Under the instructions of the Marshaller, the Commander commenced a gentle right turn to manoeuvre the aircraft along the lead-out centreline. Shortly after moving, the Flight Crew felt a jolt to the aircraft. The Commander thought that they had hit a wheel chock.

⁵ **Hot-spare:** Spare aircraft ready at short notice.

⁶ **SIGMET:** Significant Meteorological information.



The parking brake was set and the left engine was shut down. The right engine prop-brake was engaged. The Commander left the flight deck and opened the front cargo door to investigate what had caused the jolt. At that point the Co-pilot was unaware that a collision had occurred and so no request was made for the Airport Fire Service (AFS) to attend.

On opening the front cargo door, it became apparent to the Commander that the left wing-tip had struck the corner of the hangar (**Photo No. 1**). The Co-pilot was instructed to complete the normal shutdown checklist. The Flight Crew pulled the CVR⁷ circuit breaker and completed the Technical Log.



Photo No. 1: Left wing-tip impact with hangar cladding

At 20.02 hrs, ATC contacted the Airport Operations Office requesting that the Airfield Operating Officer (AOO) check on the status of the aircraft. ATC stated that it had not received any communication from the aircraft since it was given permission to taxi approximately 20 minutes earlier. The AFS were notified of the incident only after the AOO reported back to ATC at 20.08 hrs. When the AFS responded to the scene, the aircraft had been re-positioned into the hangar.

1.2 Statements

The Handling Company which employed the ground crew forwarded copies of the statements that were made by the ground personnel on the day of the event to the Investigation. A copy of the Commander's report which he made to the Operator following the event was forwarded to the Investigation together with the Operator's own Investigation report.

⁷ CVR: Cockpit Voice Recorder.

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1.2.1 Commander's Report

The Commander made a report to the Operator's Safety Office following the event. He stated: *'Aircraft left-hand wing tip struck corner of hangar whilst taxiing under marshaller's instructions from stand causing damage to navigation light and outboard leading edge. No injuries to crew or ground staff. Marshaller giving slow right turn hand instructions with no indication to stop or to hasten rate of turn up to striking building. Weather: (K) 150/24G39, 10K light rain but heavier during time of taxi. Aircraft parked near edge of apron with tail over-hanging grass verge. 55kg DG's on board zone 2 – no apparent damage to cargo that remained well strapped and netted and airport fire services handed copy of NOTOC⁸.'*

1.2.2 Marshaller's Statement

In a statement made to the Handling Company, the Marshaller stated: *'The plane started to come forward without the pilot turning on his lights. I tried to turn him onto a safe line out but he kept coming straight. [The Wingman] signalled to stop so I stopped him, but he did not stop immediately and he came into contact with the hangar.' . . . 'He [the Pilot] then said he was following my instructions which he had not as he never turned his wheels to follow my directions.'*

1.2.3 Wingman's Statement

In his statement made to the Handling Company, the Wingman stated: *'Once the plane had started up, [the Marshaller] took up his position in front of the aircraft to marshal it out. I stayed by the hangar to wing walk. The plane began to move without flashing his light so I signalled to [the Marshaller] to move him wide which he began to marshal but [the Pilot] didn't seem to be responding, he continued to move forward. He got too close to the hangar. I signalled to [the Marshaller] to stop but [the Pilot] kept going and the aircraft hit the hangar. When it did stop the aircraft Captain came out of the aircraft wondering why we had stopped the aircraft.'*

1.3 Damage to Aircraft

The Operator's Station Engineer inspected the aircraft following the incident; a copy of this engineering report was forwarded to the Investigation. The report noted that contact was only made by the wing with the external steel cladding of the hangar; at no point did the wing make contact with the internal steel structure of the building.

The outboard leading edge of the left wing and the navigation light lens cover were the only parts of the aircraft to make contact with the hangar. The leading edge of wing rib No. 31 (the outermost rib) was slightly distorted at three locations. A section of the upper flange was distorted less than 2 mm and two sections of the lower flange were distorted by less than 3 mm. HFEC NDT⁹ was carried out on this component and no cracks were detected.

⁸ NOTOC: Notification to Commander.

⁹ HFEC NDT: High-Frequency Eddy Current Non-Destructive Testing.



No sealant was disturbed on the leading edge prior to removal and there was no damage to the leading edge boot apart from a small cut. There were no marks or scratches on the aileron to suggest that contact had been made. The aileron inspection panels were removed and the aileron inspected for damage; none was found. Aileron travel checks were carried out and no faults were found. The navigation light lens and wing de-icing boot were replaced. The Aircraft Manufacturer allowed the replacement of the wing-rib to be deferred until the next C-check.

1.4 Other Damage

Two metal cladding panels covering the hangar structure and a section of corner angle cladding were damaged by contact with the wing-tip, a section of plastic drainpipe was also damaged (**Photo No. 2**). The internal steel structure of the hangar was undamaged.

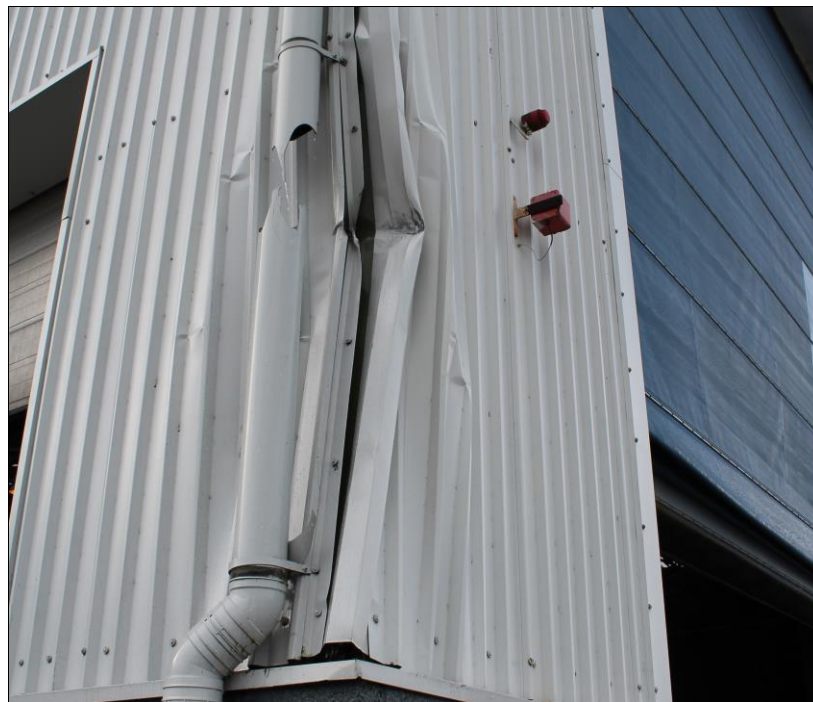


Photo No. 2: Damage to hangar

1.5 East Apron Hangar Parking Arrangements

The hangar in question is situated adjacent to a de-designated taxiway (formerly Taxiway E1) between the East Apron and Taxiway E3 (**Figure No. 1**). Responsibility for aircraft towing in these areas rests with the handling company involved. The paved area in front of the hangar (termed a support stand) was designed as temporary parking for aircraft using the hangar. It was not intended for use as a permanent parking area for loading and unloading aircraft.

In October 2010, the Operator requested permission from the Shannon Airport Authority (SAA) to use the support stand at the East Apron hangar for their aircraft. Following a risk assessment carried out by the SAA, permission was obtained for the area to be used for ATR 42 aircraft provided certain operational safety procedures were adopted.

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Both the Operator and the Handling Company used by the Operator at Shannon were notified that due to the fact that the ATR 72 is larger (both in length and wingspan) than the ATR 42, the space available adjacent to the East Apron hangar did not facilitate the safe manoeuvring of the ATR 72 in that area. Consequently, the ATR 72 type was required to park on a main apron stand or be towed into the hangar. As the ATR 42 is smaller, it was normal practice to tow/push the aircraft into its parking position and to subsequently manoeuvre off-stand under its own power.

The SAA did however allow for the long-term parking/storage of a specific ATR 72 aircraft, M-ABEV, adjacent to the hangar. The procedures described in the approval stated that this particular aircraft must not be moved under its own power while manoeuvring on the support stand and that all manoeuvring be performed by towing or tractor pushing only.

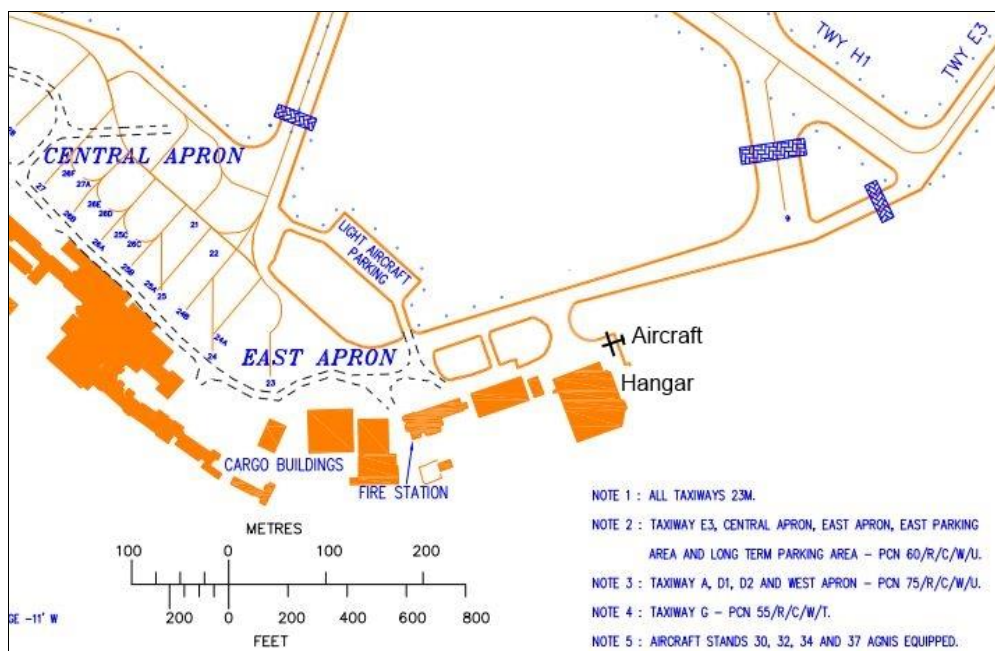


Figure No. 1: Position of aircraft and the East Apron hangar
(based on IAIP Chart AD 2.24-2)

The Operator's Route Briefing Document stated that an ATR 42 is the aircraft variant used on the route. The document did not state that the normal parking position in front of the hangar is for the ATR 42 only and was not approved for ATR 72 variant.

1.6 Reduced Wing-tip Clearance

The apron area in front of the hangar was marked to facilitate the parking of an ATR 42. When pushed into its parking position, a continuous red line marked the protected (safe boundary) area of the aircraft while parked. Yellow box markings indicated the required parking position of the main landing gear of the ATR 42.



A yellow lead-out line was marked from the position of the nose wheel such that it provided a clearance of approximately 6 metres between the left wing-tip of the aircraft and the hangar. The lead-out line was set at an angle from the parked aircraft position thus requiring an immediate right turn to be carried out upon taxi in order to follow the line and be assured of the wing-tip clearance (**Photo No. 3**).



Photo No. 3: Example of an ATR 42 parked on the East Apron support stand (*File Photo*)

As the wingspan of the ATR 72 is 2.48 metres greater than that of an ATR 42 (**Photo No. 3**), the left wingtip of EI-FXG extended into the hatched area. A photograph taken by the Handling Company prior to the departure of EI-FXG showed the left main landing gear well forward and left of the ramp markings applicable to the ATR 42, as a result, the nose of the aircraft extended well beyond the red line (protected area).

1.7 Actions taken by the Operator

The Operator conducted its own investigation of the occurrence. It concluded that it would ensure that no ATR 72 aircraft were to use the parking stand in question until an upgrade of the facilities to ICAO standard was made and a review had taken place.

The Operator stated *inter alia*, that it is their intention to include a new procedure in the Dispatch Manual to ensure that, in the event of a change of aircraft variant, the ATC repetitive flight plan is cancelled and a new one re-filed to reflect the variant change.

The Operator also stated that future audits of airport parking areas will be carried out by them to ensure that they are suitable for both ATR 42 and ATR 72 aircraft. This would allow an ATR 72 to be substituted if operational reasons require.

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The Operator held an exploratory meeting with the SAA in September 2014 to discuss upgrading the area adjacent to the East Apron hangar to safely accommodate larger aircraft. The Operator is considering the options proposed by the SAA.

2. ANALYSIS

In 2010, the SAA carried out an assessment of the suitability of the area in front of the hangar for parking and concluded that the area was suitable for the parking of the ATR 42 only.

The circumstances that led to this event were the substitution of an ATR 72 at short notice on a route that utilised an ATR 42 and the change of aircraft variant not being apparent to ATC. While aircraft types may be substituted at short notice, repetitive flight plans must also be changed to alert ATC to this fact. In this case, the repetitive flight plan was not cancelled indicating to ATC that the type was an ATR 42. Consequently, ATC cleared the aircraft to proceed beyond the East Apron to be towed into position adjacent to the hangar.

The Commander had used the airport on previous occasions but did not operate there routinely. He was unaware of the prohibition of the use of the stand by an ATR 72 due to the reduced wing-tip clearance available. The wing-tip clearance was further reduced by the position that EI-FXG was parked on arrival. Photographs taken by the Handling Company show the position of the aircraft while parked with the nose wheel well ahead and left of the normal ATR 42 nose wheel position.

With the aircraft in this position, when it commenced taxi, contact with the hangar was likely despite an immediate right turn being made by the aircraft Commander in accordance with the Marshaller's instructions. The confined manoeuvring space made both taxiing the aircraft and the provision of adequate guidance by the Wingman and Marshaller difficult tasks. Due to the parked position of the aircraft, adequate clearance between the wing-tip and hangar did not exist when the aircraft commenced its taxi.

The prevailing weather and ambient lighting conditions at the time may have contributed to the difficulties experienced by the Flight Crew and Ground personnel.

3. CONCLUSIONS

(a) Findings

1. The unsuitability of the parking area for an ATR 72 was not sufficiently promulgated to all personnel concerned in the Operation.
2. The reduced manoeuvring safety margin and prevailing conditions, resulted in contact being made by the aircraft's wing-tip with the cladding of the adjacent hangar while commencing to taxi.



3. The repetitive flight plan was not cancelled and re-filed to reflect the change in aircraft type.
4. The substitution of the ATR 42 by an ATR 72 was not apparent to ATC.
5. The aircraft was parked in an area that was unsuitable, in that there was insufficient wing-tip clearance for safe manoeuvring during taxi out.
6. The aircraft was towed and left in such a position that there was insufficient clearance between the wing-tip and the hangar when taxi out commenced.
7. The confined manoeuvring space made both taxiing the aircraft and providing adequate guidance by the wingman and marshaller a difficult task.

(b) Probable Cause

Collision with a building structure due to insufficient wing-tip clearance for safe manoeuvring in an area that was unsuitable for that aircraft type.

(c) Contributory Cause(s)

1. The unsuitability of the parking area for an ATR 72 was not sufficiently promulgated to all personnel concerned in the Operation.
2. Due to the parked position of the aircraft, adequate clearance between the wing-tip and hangar did not exist when the aircraft commenced its taxi.
3. The prevailing weather and ambient lighting conditions at the time.

4. SAFETY RECOMMENDATIONS

This Report does not sustain any Safety Recommendations.

In accordance with Annex 13 to the Convention on International Civil Aviation, 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 this investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such 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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