# Air Accident Investigation Unit Ireland

## SYNOPTIC REPORT

## ACCIDENT

## Cessna F172M, EI-GSE
## Cork Airport
## 19 July 2013


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

## 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 13[1] to the Convention on International Civil Aviation, Regulation (EU) No 996/2010[2] and Statutory Instrument No. 460 of 2009[3], 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] **Annex 13**: International Civil Aviation Organization (ICAO), Annex 13, Aircraft 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 No. 460 of 2009, the Chief Inspector of Air Accidents, on 19 July 2013, appointed Mr Paddy Judge as the Investigator-in-Charge to carry out an Investigation into this Accident and prepare a Report. Due to the retirement of Mr Paddy Judge, Mr Leo Murray, an Inspector of Air Accidents, was appointed to complete the publication of the Report.

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|---|---|---|
| Aircraft Type and Registration: | Cessna F172M, EI-GSE | |
| No. and Type of Engines: | 1 x Lycoming O-320-E2D | |
| Aircraft Serial Number: | 1105 | |
| Year of Manufacture: | 1974 | |
| Date and Time (UTC[4]): | 19 July 2013 @ 12.15 hrs | |
| Location: | Runway (RWY) 17, Cork Airport (EICK)<br>N51°49.99' / W008°28.94' | |
| Type of Operation: | General Aviation, Flying School, Training | |
| Persons on Board: | Crew - 2 | Passengers - 0 |
| Injuries: | Crew - 0 | Passengers - 0 |
| Nature of Damage: | Aircraft<br>Aerodrome | Substantial<br>Minor |
| Commander's Licence: | CPL(A)[5] issued by the Irish Aviation Authority (IAA) | |
| Commander's Details: | Male, aged 38 Years | |
| Commander's Flying Experience: | 2,953 hours, of which 721 hours were on type | |
| Notification Source: | Air Traffic Control (ATC) Cork Airport | |
| Information Source: | AAIU Field Investigation | |



[4] **UTC**: Universal Time Co-ordinated. All timings in this report are quoted in UTC; to obtain the local time add one hour.
[5] **CPL(A):** Commercial Pilot Licence (Aeroplane).

## SYNOPSIS

The Instructor and his Student were conducting a cross-country training flight with an en-route landing at EICK. Following a touch-and-go landing on RWY 17 at EICK the engine lost power at a low height. The Instructor assumed control, banked left and landed the aircraft in a grassy area adjacent to the end of the runway. After a short ground run the aircraft collided at low speed with the airport's chain link boundary fence. Although the aircraft was damaged there were no injuries.

The Investigation did not conclusively determine the cause of the engine power loss although conditions were such as to make carburettor icing a likely cause.

## 1. FACTUAL INFORMATION

### 1.1 History of the Flight

The aircraft originally departed from Weston Airport (EIWT) on a flight plan to EICK, Waterford Airport (EIWF) and back to EIWT. The crew consisted of an Instructor and a Student pilot, the Student acting as Pilot Flying (PF). The flight was a cross-country navigation exercise, the intention being to perform touch-and-go landings at both Cork and Waterford.

The aircraft commenced an approach to RWY 17 at EICK at 12.10 hrs during which EICK Tower cleared the aircraft for a touch-and-go landing. Following the touch-and-go at 12.14 hrs and immediately after EI-GSE was cleared for an early left turn to EIWF, the aircraft reported an "engine failure". A forced landing was conducted with the aircraft landing within the airport's perimeter to the east of the end of RWY 17 at 12.15 hrs. A Rescue Vehicle, which had commenced a normal runway patrol at the time, was immediately dispatched to the site and arrived within 30 seconds with fire tenders arriving shortly afterwards. Although the aircraft had collided with a boundary fence there were no injuries and both occupants walked away from the aircraft unaided.

### 1.2 Instructor

The Instructor stated that the training detail, a long navigation exercise, included en-route landings at both EICK and EIWF but no full stop landings were intended. The weather was fine as they approached EICK at 1,500 ft on the QNH[6]. He said that the Student flew the approach to RWY 17 and that carburettor heat was on during the final approach with the mixture selected to fully rich. Although they got high on finals and power was reduced, he estimated that they touched down about one third of the way down the runway Since there was a 10 kts crosswind at the time they took the opportunity to practice crosswind landing technique. As per normal procedure the flaps were then selected up, the carburettor heat was selected to full cold and power was applied following which the aircraft became airborne. He said that initially there was no problem but then there was a sudden total power loss between, he estimated, 200-400 ft, but he was unsure if the engine had stopped or not.

[6] **QNH**: An altimeter barometric setting that displays altitude above sea level.

He immediately assumed control from the Student and lowered the nose but could see that he was quite restricted in landing areas within the 30° left and right sector. He called ATC and immediately turned the aircraft left into wind, he thought through possibly 100°, towards a grassy area adjacent to the runway. He managed to get some flaps out and, having levelled the wings, put the aircraft on the ground close to the threshold of RWY 35. He stated that the touchdown was firm but that the aircraft did not bounce.

He stated that he applied *"braking but there was very little braking there and unfortunately impacted the fence doing about 10 kts or so*". After his student informed him that he was okay they immediately exited the aircraft. As there was no leakage or fire, he re-entered and switched off fuel and electrics, which he had not had time to do during the forced landing. He commented that, as the occurrence happened at a low height, he had insufficient time to complete all checklist items as his attention was focussed on landing the aircraft safely.

Although he taught his students to conduct forced landings after take-off within the 30° left and right sector, this was not an option in this case and he believed that he had made the right decision by maintaining his speed and turning the aircraft into wind towards a clear area. He stated that he taught students to apply carburettor heat at all times when power was outside the green arc [i.e. tachometer readings under 1,900 RPM]. He stated that the after landing procedures when conducting a touch-and-go, were to select flaps up, full power and carburettor heat to cold in that order. The engine temperatures and pressures had been normal during the flight and he estimated that there was 35 to 38 gallons of fuel on board at the time of the occurrence.



Although a carburettor temperature gauge was fitted to EI-GSE, he said that he had not noticed its reading. He was unsure about its accuracy and relied more on the 100-150 RPM drop that occurred when the carburettor heat was selected on, since the carburettor heater fitted to EI-GSE was quite effective.

He stated that he had a previous event in EI-GSE when a temporary loss of power occurred after take-off. In that case the aircraft had not flown for some days and the problem may have been caused by water in the fuel, even though he had opened the water drains on the fuel tanks as part of his pre-flight. The rough running had cleared itself in that case but he felt that this occurrence was different in that there was a total loss of power.

He had previously experienced carburettor icing on a Cessna 152 during winter practice forced landings when if power is left off for a time the engine then runs roughly. He said that he did not think that the power loss he had experienced was symptomatic of carburettor icing. Although the Instructor accepted the possibility of carburettor icing conditions existed at the time, he believed that the loss of power might have been due to a fuel supply problem with the engine, particularly as there had been no prolonged operation of the engine at idle. He stated that the only time the engine was at idle was during the final 1,000 ft descent when they got a little high during the approach.

## 1.3 Student

The Student said that on the flight to EICK there had been no problems with the engine and that the carburettor heater operated normally with no ice detected. They landed a little long and then took-off again at about 70 kts.

He stated that at about 250-300 ft, when he was receiving instructions from ATC, there was a sudden jolt from the engine and the nose dropped. He heard a backfire and believed that power was lost completely over approximately 4 seconds with the propeller wind-milling thereafter.

The Instructor took control, made a quick radio call, lowered the nose to retain speed and turned left into wind. After they landed, the aircraft skidded across the grass and made contact with the fence. They were wearing shoulder harnesses at the time. He stated that they had been using full throttle with the mixture selected to fully rich and the carburettor heater to cold when the power failed.

Full fuel had been taken from EIWT with the fuel selector at BOTH. He stated that the aircraft tended to draw fuel from the left hand tank first in that position. He said the Instructor was quite insistent that the throttle should be operated before carburettor heat is selected to COLD during a touch-and-go. He had used the carburettor heater regularly during the flight without any evidence of carburettor icing being present.

## 1.4 Ground Witness

This witness was working on the ramp and heard the aircraft passing by. It climbed away and he heard the engine "*running very rough*". He stated that the engine continued to run very badly with a popping sound. The aircraft put its nose down and it made a sharp left hand turn. When it got to 3-4 metres from the ground the wings were levelled. After the touchdown the aircraft came to a stop when it hit the fence at a low speed.



## 1.5 ATC Report

EICK Tower cleared the aircraft for a touch-and-go landing with a left hand turn out to EIWF afterwards, adding that the wind was 090°/10 kts. After the touch-and-go, ATC requested the aircraft at 12.14 hrs to make an early left hand turn out to EIWF and immediately EI-GSE declared an engine failure. The Tower cleared the aircraft to land. There were no further transmissions from the aircraft.

The Tower reported that the aircraft touched down approximately 60 m east of the RWY 35 threshold close to the perimeter fence. A Rescue Vehicle, which had commenced a runway patrol at that time, proceeded immediately to the location of the accident site. Further rescue vehicles were dispatched to the scene. ATC then reported seeing the Pilots walking away from the aircraft unaided.

## 1.6 Site Examination

RWY 17/35 at EICK is located on the saddle of a hill with the ground sloping away from both ends of the runway. The topography of the RWY 17 overshoot area consists of a downslope with houses and small fields that are not suitable for forced landings.

A perimeter chain link fence with strands of barbed wire protects the airport boundary. At the accident site location the fence runs parallel to RWY 17/35 at a distance of approximately 200 m and is supported at regular intervals by concrete posts.

The aircraft came to rest embedded in the fence directly abeam the threshold of RWY 35 (**Photo No. 1**) on a heading of 085°M.


**Photo No. 1:** Resting position of EI-GSE

Witness marks from the aircraft's three wheels were found on the grass leading to the impact with the fence. Overall, the main wheels marks were 138 m long on a track of 055°M. Grass markings showed evidence that the touchdown was left wheel first, then the right wheel and nose wheel. Torn grass in the marks made by the main wheels was consistent with braking having commenced shortly after the nose wheel made ground contact, 22 m after initial touchdown.



Diagonal scuffing marks on the tyres were consistent with an attempt being made to turn the aircraft left while braking. The right wing sustained damage to the leading edge from a concrete post. The outermost section of the right aileron was damaged by a strand of barbed wire trapped in the gap between the aileron and the wingtip. The flight controls operated normally other than an aileron restriction caused by the trapped barbed wire.

The aircraft was removed from the fence, pushed back to level ground and inspected. The spinner of the propeller, which had been embedded in the chain link fence, had suffered minor damage. There was little evidence of any witness marks caused by propeller rotation against the chain link fence; this was consistent with the engine not being under power when it collided with the fence. The flaps were found partially extended and, following removal of the barbed wire, all flight controls operated normally.

The aircraft was fitted with a Hobbs Meter which displayed 6,975.4 hours (the tachometer read 5,848.5 hours). On selecting the Master Switch on, the aircraft's fuel gauges showed the left tank half full and the right tank three-quarters full. The aircraft was fitted with a carburettor temperature gauge which when powered read the ambient temperature. The wing flaps gauge indicated approximately 25°, consistent with the wing flaps' position.

The engine was then started normally and ran correctly at low power. Following a check of the engine controls and magneto drops, all of which were normal, the engine was stopped. The aircraft was then pushed to the flight strip where the engine was restarted and further ground running successfully conducted. Following this, the aircraft taxied unaided to the light aircraft park for storage and further examination.

## 1.7 Engine and Fuel Examination

The engine and fuel system of EI-GSE was later examined on 27 August 2013 under the supervision of an AAIU Engineering Inspector. The fuel tanks and both filler cap seals were found serviceable and in good condition. The tanks' internal surfaces appeared clean, their coatings were intact and the tank fuel (100LL) was clean and bright.

The carburettor feed line was disconnected and fuel flow checks were carried out with the fuel selector in the Left, Right and Both fuel tanks positions. Fuel flow was found to be adequate in all cases. The fuel strainer bowl had some corrosion/staining at the bottom which is not unknown, as this is where water will settle by design. The carburettor was removed and examined. All components were deemed serviceable and the operation of the carburettor was verified by hand. The carburettor air box was examined and the carb heat flapper valve was exercised. Although small portions of the flapper valve seal were missing this was not considered significant.

Some minor buckling was found on the engine firewall/bulkhead suggesting that there had been a heavy impact on the nose wheel. However, no evidence was found of any issue that could account for the reported power loss during the occurrence.



The aircraft was later considered to be beyond economical repair because of the damage to the engine bulkhead.

## 1.8 Meteorology

The weather reports for EICK about the time of the accident were for clear skies with an easterly breeze, the outside air temperature being 23°C. The following are the meteorological observations recorded at the Airport:

METAR EICK 191200Z 08014KT CAVOK 23/16 Q1025 NOSIG.
METAR EICK 191230Z 10010KT 9999 FEW028 23/17 Q1025 NOSIG.

## 1.9 Personnel Information

The Instructor had been issued with a CPL (A) by the IAA on the 20 March 2007 which was converted to a Joint Aviation Authorities (JAA) licence on the 12 November 2009. His Single Engine Piston (SEP) Land Rating was renewed on the 26 May 2012 and was valid for two years; his Flight Instructor Rating (A) was also valid. His Medical Certificate Class 1 was issued by the IAA on the 24 July 2012, was valid and there were no restrictions. His flying experience consisted of 2,953 hours, of which 721 hours were on the accident aircraft type.

The Student had been issued with Private Pilot Licence (PPL) Airplane Single Engine Land, by the Federal Aviation Authority (FAA) on the 4 October 2012. There were no limitations.

He also held a valid Student Pilot Licence (SPL) issued by the IAA. His Class 2 medical certificate was valid. His flying experience was a total of 160 hours of which 7 hours was on the accident aircraft type.

## 1.10 Airworthiness

EI-GSE is a Reims-Cessna F172M[7]. This four seat aircraft is a high-wing aeroplane equipped with a fixed tricycle landing gear and a steerable nose gear. The fuselage and empennage are of an all-metal semi-monocoque design, the wing span being 11.15 m with an overall length of 8.17 m. The wings are externally braced with electrically actuated wing-flaps. The aircraft is equipped with dual controls and can be flown from either of the two cockpit seats. Its Basic Weight was recorded as 1,506 lbs. The Maximum Take-Off Weight (MTOW) allowed was 2,300 lbs.

The aircraft is powered by a single Lycoming O-360-E2D reciprocating engine, which has four horizontally opposed, air cooled cylinders. The engine drives a fixed pitch, two bladed propeller. Fuel flows to the engine by gravity from two fuel tanks in the wing (one per side) to a fuel selector valve labelled, BOTH, RIGHT, LEFT and OFF. Thereafter, it flows through a strainer to the carburettor. The Fuel selector should be in the BOTH position for take-off and landing.

The Airworthiness Review Certificate (ARC) NFC/1/016 for EI-GSE, which was issued by the IAA on the 28 July 2012, was valid. The aircraft had been maintained according to the applicable Continuing Airworthiness Management Exposition (CAME). The tachometer at the time of the accident read 5,848.5 hours with the next check due at 5,878.5 hours. The most recent Certificate of Release to Service was issued on the 31 May 2013 on completion of a scheduled maintenance check (Maintenance OP1) at a tachometer reading of 5,825.7 hours.



## 1.11 Carburettor icing

Carburettor icing, or more accurately Induction Icing, is the build-up of ice in the fuel/air induction system of a piston engine. It is more likely to form on engines fitted with a carburettor than fuel injection and some models of aircraft are more liable to be affected than others.

Induction Icing consists of three types of icing: Impact, Fuel and Throttle:

**Impact Ice** normally forms on surfaces in moist air conditions with temperatures between -10°C and 0° when visible precipitation is present and is generally most likely at about -4°C. It can affect any fuel induction systems on piston engines.

**Fuel Ice** forms at and downstream from where fuel is introduced into the airstream and becomes vaporised. At that location, any moisture freezes as a result of the latent heat loss due to fuel vaporisation. It can occur whenever the relative humidity is more than 50% but is most likely to occur at temperatures between +4°C to +27°C. However, it may occur at higher values but does not affect fuel injected systems.

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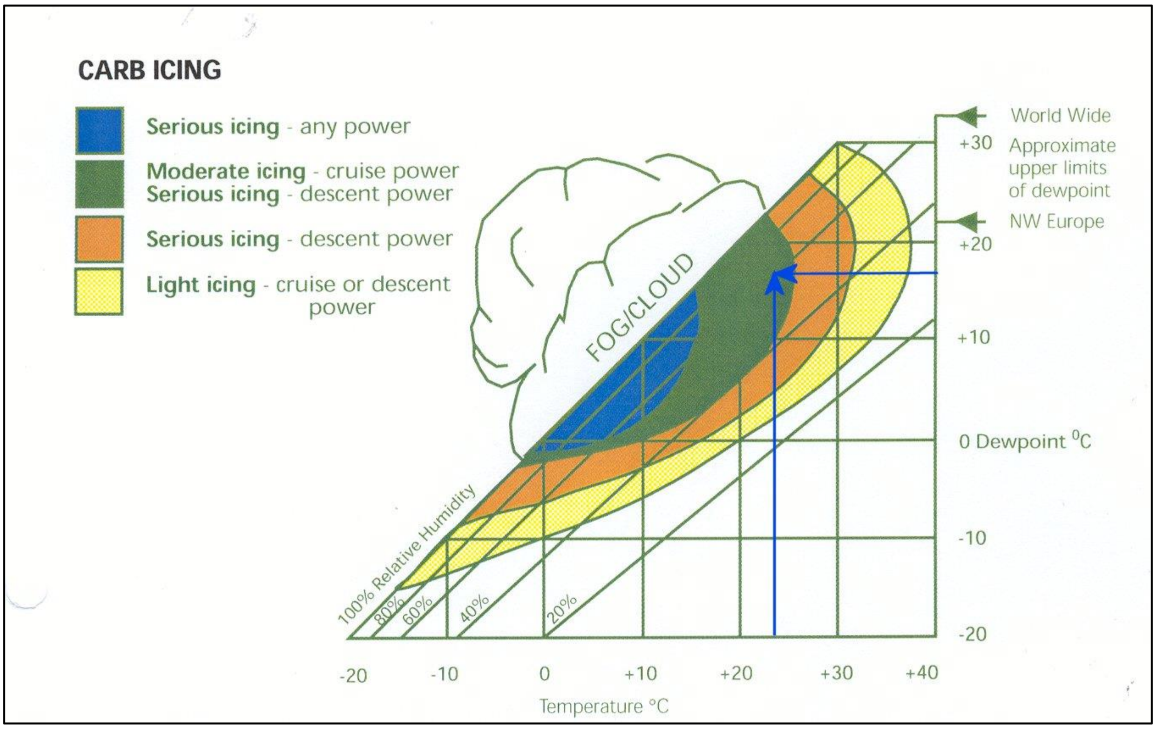
[7] **F** in the model number indicates that the aircraft was built in France. **M** indicates that it was built between 1973 and 1976.

**Throttle Ice** is the most common and serious form of carburettor icing. It forms at or near the throttle butterfly valve when precipitation in the induction air condenses and freezes as it passes the venturi and throttle valve; the condensed water will form ice on the surfaces of the carburettor. This ice gradually blocks the venturi, changing the fuel/air ratio and causing a progressive, smooth loss of power. It generally forms between 0°C to +3°C but may form at higher temperatures since the temperature drop in the air at that location may be up to 20-30°C.

Further information on carburettor icing is published by the IAA in its Safety Leaflet on Piston Engine Icing, the UK Civil Aviation Authority (CAA) in Safety Sense Leaflet No. 14 Piston Engine Icing and European General Aviation Safety Team (EGAST) in its Safety Promotion Leaflet Piston Engine Icing (GA5), from which the **Graphic No. I** is reproduced. A further chart is displayed in **Appendix A, Graphic No. 2**.




**Graphic No. 1:** Icing probability at the time of the occurrence

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## 1.12 Use of Carburettor Heat

The carburettor heater on the Cessna 172 draws heated air from around the exhaust riser which is ducted through a heater valve into the carburettor. The heater valve is controlled by the pilot and, when operated, results in a drop of approximately 150 RPM at high power settings. The effectiveness of carburettor heat is reduced at low power settings. EI-GSE was fitted with a carburettor temperature gauge (**Photo No. 2**).


**Photo No. 2:** EI-GSE carburettor temperature gauge

The Federal Aviation Administration (FAA) in Advisory Circular (AC) 20-113 advises:

> *7) With instrumentation such as carburetor or mixture temperature gauges, partial heat should be used to keep the intake temperature in a safe range. Without such instrumentation, full heat should be used intermittently as considered necessary*

The Textron Lycoming Operator's Manual for the engine of EI-GSE provides guidance for the use of Carburettor Heat Control in Section 3, c:

> ***Use of Carburetor Heat Control** - Under certain moist atmospheric conditions at temperatures of 20° to 90°,* [-7°C to 32°C] *it is possible for ice to form in the induction system, even in summer weather. This is due to the high air velocity through the carburetor venturi and the absorption of heat from this air by vaporization of the fuel. The temperature in the mixture chamber may drop as much as 70°F* [21°C] *below the temperature of the incoming air. If this air contains a large amount of moisture, the cooling process can cause precipitation in the form of ice. Ice formation generally begins in the vicinity of the butterfly and may build up to such an extent that a drop in power output could result. A loss of power is reflected by a drop in manifold pressure in installations equipped with constant speed propellers and a drop in manifold pressure and RPM in installations equipped with fixed pitch propellers. If not corrected, this condition may cause complete engine stoppage.*

The Cessna Pilot's Operating Handbook (POH) checklist for Before Landing states *inter alia*:

> *4 Carburettor Heat – ON (apply full heat before closing throttle).*

In the case of a "Balked Landing" (i.e. a go-around or a touch-and-go), the checklist states *inter alia*:

> *1 Throttle – FULL OPEN*
> *2 Carburettor Heat – COLD*
> ……………

Regarding carburettor icing the POH states:

> *A gradual loss of RPM and eventual engine roughness may result from the formation of carburettor ice. To clear the ice, apply full throttle and pull the carburettor heat knob full out until the engine runs smoothly…….*

The IAA's Safety Leaflet on Piston Engine Icing recommends:

> ***i. Descent and Approach***
>
> *Carb icing is much more likely at reduced power, so select hot air* ***before, rather than after,*** *power is reduced for the descent, and especially for a practice forced landing or a helicopter autorotation, i.e. before the exhaust starts to cool. (This also allows a check that no ice is present and that the carb heat is still working.) Maintain FULL heat during long periods of flight with reduced power settings. At intervals of about 500 ft or more frequently if conditions require, increase power to cruise setting to warm the engine and to provide sufficient heat to melt any ice.*

## 2. ANALYSIS

The Investigation found that, subsequent to the removal of the aircraft from the airport's perimeter fence, the engine started and operated normally. Following the Instructor's comments, the Investigation later examined the aircraft, its fuel system and engine and found no defects that could have contributed to the power loss sustained by the engine.



The Investigation notes that the outside air temperature on the day, though warm at 25°C, was in a regime when moderate carburettor ice was possible at cruise power and serious icing at descent power (**Graphic No. 1**). Both pilots reported that carburettor heat had been applied a number of times during the earlier cruise, that no carburettor icing had been observed and the engine operation had been normal. Although a carburettor temperature gauge was fitted it was not trusted and its readings were disregarded; instead the tachometer RPMs were relied on. Had attention been paid to its readings during the final approach it is possible that the gauge may have indicated a requirement for carburettor heat.

Due to the fact that ice in the internal fuel/air induction system of a piston engine rapidly disappears when a warm engine is stopped, it is difficult to prove conclusively if an engine has lost power due to induction icing. Nevertheless, due to the fact that the aircraft got high on finals and that consequently the throttle had been at idle during the final 1,000 ft descent to the runway, carburettor icing cannot be ruled out.

The Investigation notes that the IAA's Safety Leaflet recommends that during descent, with carburettor heating selected on, power should be increased every 500 ft to cruise settings to ensure that warm air reaches the engine induction manifold. As in this particular approach, this is difficult in circumstances where the aircraft becomes high on finals, as this will result in the aircraft becoming higher and thus the approach less stabilised.

Since the aircraft was withdrawn from service after the occurrence and not flown again, an undiscovered technical reason for the power loss cannot be ruled out. Furthermore, the reported loss of power when the engine was running at a high power setting is not a typical manifestation of carburettor icing. Nevertheless, the rough running reported by the ground witness coupled with the loss of power reported by the Student over approximately four seconds are consistent with symptoms of carburettor icing, even though the power had been advanced first and the carburettor heater then selected to cold during the touch-and-go.

Following power loss, the experienced Instructor immediately took control, lowered the nose and made a quick call to ATC advising of an engine failure. Faced with limited options in making a forced landing ahead, the Instructor successfully turned the aircraft sharply left into wind, thereby landing on one of the few clear areas available for a safe landing. The guidance given in regard to a forced landing due to an engine failure after take-off is to limit the landing sector to the 60° sector ahead (30° to the left and right). In this case that was a poor option due to the nature of the terrain ahead and consequently the Instructor made a large turn to the left. Most importantly, he had sufficient height and maintained enough airspeed to be able to achieve a steep 115° turn without losing control of the aircraft by stalling. To a large part this was due to good handling by the Instructor who quickly lowered the nose of aircraft when engine power was lost, thus maintaining the aircraft's energy level and airspeed until touchdown.

Although the engine bulkhead was subsequently found buckled, no evidence was found at the accident site of a heavy landing on the nose gear. Site evidence was consistent with a normal touchdown with the Instructor commencing braking very shortly after touchdown. Due to poor braking on the grassy surface there was insufficient distance in which to stop the aircraft although nose wheel scuffing showed that an unsuccessful attempt had been made to turn the aircraft away from the fence. The aircraft suffered damage to the right wing when it struck the fence and it is probable that the engine bulkhead buckling was also result of this impact. In any case the impact occurred at a low speed and there was consequently no injury.



## 3. CONCLUSIONS

### (a) Findings

1. The aircraft had been maintained according to the applicable Continuing Airworthiness Management Exposition and its Airworthiness Review Certificate was valid.

2. The Instructor's licence was valid and he was appropriately qualified.

3. No evidence was found in the examination of the aircraft and its engine of a pre-existing defect that might have caused or contributed to a power loss.

4. Atmospheric conditions on the day were conducive to carburettor ice formation at low power settings.

5. A period of low power operation during the final approach increased the likelihood of carburettor ice formation.

6. The engine power loss was possibly due to carburettor icing, although this could not be conclusively established.

7. The Instructor correctly took control of the aircraft following power loss.

8. Due to limited areas where a forced landing could be safely achieved a significant left turn was made, contrary to normal guidance. This turn, which was justified in the circumstances, was into wind and towards level ground beside the runway.

9. Following touchdown the distance available to stop was inadequate due to poor braking provided by the grassy surface.

10. The aircraft impacted the Airport's boundary fence, sustaining damage to the right wing and probably the engine bulkhead.

11. There was no fire or injuries.

12. The Emergency Services promptly attended the accident site.



**(b) Probable Cause**

1. Loss of power for undetermined reasons during initial climb, but possibly due to carburettor icing.

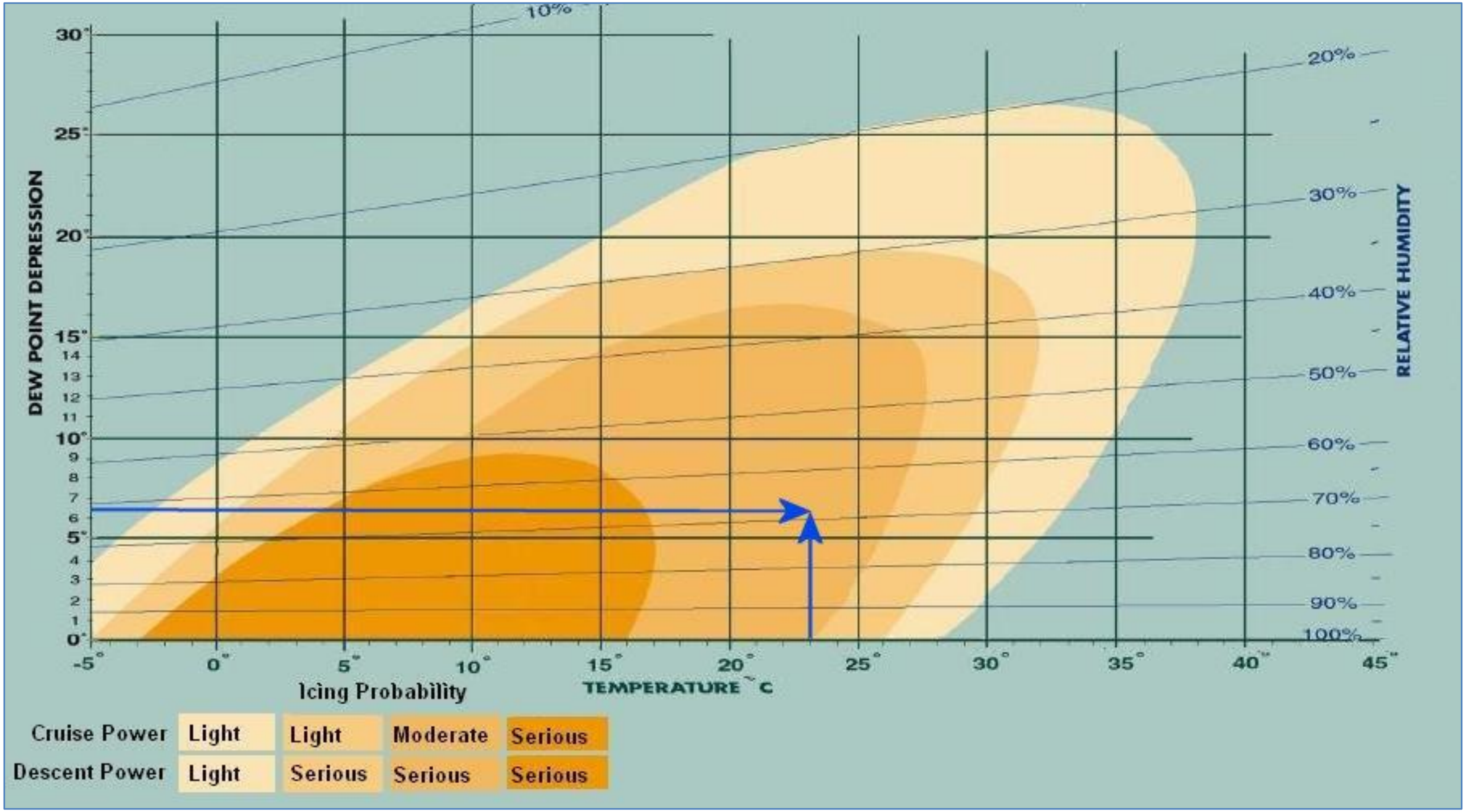
**(c) Contributory Cause**

1. Limited options where a forced landing could be safely conducted.
2. Inadequate distance in which to stop the aircraft following touchdown.

## 4. SAFETY RECOMMENDATIONS

This Investigation does not sustain any Safety Recommendations.

# Appendix A




**Graphic No. 2:** Probability of Carburettor Icing

**Note:** Dew point Depression is calculated by subtracting the Dew Point temperature from the Outside Air Temperature.

**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.**

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An Roinn Iompair Turasóireachta agus Spóirt

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