## ACCIDENT

| | |
|---|---|
| **Aircraft Type and Registration:** | Britten-Norman Islander, VP-MNI |
| **No & Type of Engines:** | 2 Lycoming 0-540-E4C5 piston engines |
| **Year of Manufacture:** | 1971 (Serial no: 183) |
| **Date & Time (UTC):** | 23 September 2019 at 2020 hrs |
| **Location:** | John A Osborne Airport, Montserrat |
| **Type of Flight:** | Commercial Air Transport (Passenger) |
| **Persons on Board:** | Crew - 1 Passengers - 6 |
| **Injuries:** | Crew - None Passengers - None |
| **Nature of Damage:** | Left tailplane spar and elevator bent, left wingtip and aileron damaged |
| **Commander's Licence:** | Commercial Pilot's Licence with Montserrat Certificate of Validation |
| **Commander's Age:** | 30 years |
| **Commander's Flying Experience:** | 660 hours (of which 303 were on type)<br>Last 90 days - 85 hours<br>Last 28 days - 21 hours |
| **Information Source:** | AAIB Field investigation |

### Synopsis

The aircraft was flying from Antigua to Montserrat, which was experiencing a heavy rain shower. After the shower had passed the aircraft made a normal approach in a light tailwind to Runway 10, which was still wet from the rain. The pilot made a positive touchdown and applied appropriate braking but was unable to stop the aircraft. The pilot steered the aircraft to the right but it skidded through 180° and departed the level surface of the airfield backwards, down a steep incline at the end of the runway, before coming to a stop when the tail caught in the airport security fence. The pilot and passengers were able to exit the aircraft and the airport rescue and firefighting service responded promptly.

No aircraft defects were found that would have contributed to the outcome. The touchdown groundspeed was 79 kt, which was higher than appropriate, either because the approach was flown at an airspeed greater than the normal 65 kt, or because of a significant change in windspeed and direction during the approach. This, combined with a wet runway and skidding, resulted in the aircraft requiring more distance to stop than was available on the runway. Three Safety Recommendations are made regarding aircraft operation, access for rescue and firefighting vehicles, and a means of arresting aircraft that overrun the runway.

## History of the flight

The pilot had flown the aircraft from Montserrat Airport to Antigua earlier in the day and was on the scheduled return flight to Montserrat Airport. The weather was good but with heavy rain showers passing over the destination, the progress of which the pilot was monitoring using an aviation weather service. With all six passengers ready, the aircraft departed early, with the intention of holding close to the island and waiting for any rain showers to pass through.

The normal pre-flight checks were carried out, including an external inspection of the wheel brake systems and functional checks prior to and during the taxi to the runway. The brakes operated normally as they had done on the previous flight. Before starting the engines, the pilot gave a safety briefing covering all the required items, including the use of seat belts and emergency exits. The departure was normal, and the aircraft climbed in VMC to a transit altitude of 2,000 ft, but it was not possible to fly a direct track due to the rain showers. The aircraft held to the north of the island where the pilot could maintain visual contact with the surface of the sea. This required the aircraft to descend on occasions to remain clear of cloud but in sight of the surface, in turbulent conditions.

As the showers moved away the rain cleared, and the island became visible. There was some low stratus, reported as FEW[1] clouds at 100 ft, and with wind indicated as 140° at 6 kt, the pilot obtained a clearance to join left hand downwind for Runway 10. The runway edge lights were illuminated, and the pilot established on the final approach describing the weather as 'rough', with full flap selected and an approach speed of 65 KIAS by 1,000 ft above the airfield elevation. The air traffic controller passed an updated surface wind of 210° at 6 kt, stated that the runway was wet and offered Runway 28 for landing. The pilot elected to continue for Runway 10 and made the normal 6° glidepath approach, touching down positively but, according to several witnesses, faster than normal. The aircraft was not fitted with GPS equipment and no groundspeed information was available.

The pilot applied the toe brakes with the pressures appearing normal and then released them momentarily, as they had little effect, before applying them again. The aircraft was not slowing down and as it passed the taxiway intersection, the brakes were applied much harder, again with little effect. With the end of the runway approaching, the pilot applied full right aileron and right rudder, intending to turn onto the grass area alongside the runway in order to avoid going off the end. The aircraft entered a skidding motion and turned through 180˚ to the right before going backwards over the edge of the airfield, stopping when the tail section struck the perimeter security fence (Figure 1). The pilot selected the engine mixture levers, magnetos, fuel and electrical master switch all off. After the pilot had established that none of the passengers were hurt, all the occupants evacuated the aircraft through the normal doors and made their way back onto the airfield where the RFFS was in attendance.

**Footnote**

[1] Obscuring up to a quarter of the sky.

## Accident site

Faint scald marks made by the tyres on the runway showed the aircraft skidded approximately 150 m before veering on to the grass approximately 19 m from the end of the runway. The aircraft continued across the grass whilst braking, leaving discoloured tyre marks in the grass. The right main wheels struck one of the runway threshold lights. During the transit across the grass the aircraft rotated through 180° immediately before dropping backwards down the sloping side of the ravine at the end of the runway. The aircraft's rearward motion was slowed by dense reeds and bushes on the sides of the ravine. It stopped when the left tailplane and wingtip hit the barbed wire and chain link perimeter fence approximately 8 m below the level of the runway. As the aircraft stopped the Bendix-King KX165 Nav-Comm unit fell out of its rack mount onto the cockpit floor. Figure 1 shows the aircraft after the accident held by the fence and at an approximate angle of 30°.

**Figure 1**
Aircraft accident site

## Recorded information

A CCTV camera was mounted on the ATC tower and recorded the latter stages of the final approach and touchdown. From these images, the touchdown groundspeed was estimated to be 79 kt. Figure 2 shows a single frame of the recording at the point of touchdown with the wet runway and water spray being produced by the main landing gear wheels.

**Figure 2**
VP-MNI at the point of touchdown on Runway 10

## Aircraft information

The Islander is an all metal twin piston engine high wing monoplane. It has fixed tricycle landing gear with a single nosewheel and twin main wheels. It is fitted with conventional mechanical flying controls and electrically driven flaps. VP-MNI can carry up to nine passengers and has a baggage hold at the rear with a maximum load of 400 lb.

Access to the cabin is via a door on the left side rear of the fuselage for the rearmost two rows of seats. A door on the right side of the fuselage opposite the engine nacelle gives access to the two rows of seats immediately behind the pilot's seats. The left and right pilot's seats are accessed via a door in the front left side of the fuselage. The doors are held closed by latches operated by lockable handles and, in the case of the pilot's door, have an interlock preventing them from being opened when the magnetos are ON. All the doors are available as emergency escape routes and their windows can be jettisoned in the case of a door jamming closed.

*Wheel brake system*

The wheel brake system consists of a single disk attached to each wheel with multi piston callipers. Master cylinders and fluid reservoirs are attached to each pedal on the rudder bar. The brakes are operated by foot pressure acting on the upper articulated part of the foot pedal. Each pedal can be operated independently to facilitate differential braking. The brake operating system is duplicated on the co-pilot (right) side of the aircraft. The wheel brakes are not fitted with an anti-lock or anti-skid system and there is no indication to the pilot of brake pressure or force when the brakes are applied.

*Tyres*

The aircraft was fitted with tubeless pneumatic tyres and on the main wheels have a normal inflation pressure of 35 psi.

## Aircraft examination

Most of the damage was to components and structure at the rear of the aircraft. The left side of the tailplane main spar had broken at the root and was bent upwards (Figure 3). The elevator structure had also been damaged and bent in the same way. The rear anti-collision light had been displaced and was held only by its wiring. The left wingtip fairing and outer end of the aileron was dented and distorted.

**Figure 3**

Tailplane damage

The landing gear and wheel brakes were undamaged. The tyres did not deflate but the nose and right inner mainwheel had tufts of grass trapped between the tyre bead and rim. Blistering was present on three of the mainwheel tyres; the right outer tyre rolling surface showed evidence of blistering, approximately 75 to 100 mm long, at its edges and to a lesser extent on its centre tread (Figure 4). In general, the tyres showed wear commensurate with normal use.

The right main landing gear strut appeared to have been displaced outwards very slightly and had displaced the rubber seal between the strut fairing and lower rear engine cowl panel.

The nav-comm unit mounting rack and its Allen head locking screw did not appear to be damaged.

The rear covering panel of one of the passenger seats had detached during the accident. This was found to have occurred when one of the passengers hurriedly exited the aircraft.

**Figure 4**
Tyre wear and damage

### Weight and balance

The aircraft was below its maximum landing weight and within the required CG limits.

### Landing performance

The landing performance for the aircraft is obtained from the Aircraft Flight Manual, Performance section. At the estimated landing weight of approximately 6,220 lbs, the Landing Distance Required (LDR)[2] for a dry, level runway with no head or tailwind component at an elevation of 550 ft and an OAT of 30°C, is 448 m. For a wet runway, 15% must be added giving an LDR of 515 m. This is predicated on the approach speed of 65 KIAS being reduced to a threshold speed of 58 KIAS.

The operator stated that it expects its pilots to touch down as close as safely possible to the threshold of the runway, to make the maximum use of the LDA.

**Footnote**

[2] The LDR obtained from the AFM includes a safety factor of 1.3. The LDR is from a height of 50 feet above the Touch Down Point (TDP) and not the length of the ground run.

## Aerodrome information

Montserrat John A Osborne Airport is operated by the Government of Montserrat under the Air Navigation (Overseas Territories) Order with regulatory safety and security oversight and inspection provided by UK based Air Safety Support International Limited. Aircraft movements are only permitted by day under Visual Flight Rules. Strict operating conditions are applied to the classes of aircraft which may use the airport and on pilot training, experience and qualification to operate them at the airport.

The airport is sited on a hill with a single runway orientated 10/28 (Figure 5). The thresholds of Runway 10 and 28 are 550 ft amsl. Runway 10 has Precision Approach Path Indicators (PAPIs) set to an approach angle of 6° and Runway 28 has Abbreviated PAPIs (APAPIs) set to an approach angle of 4°.

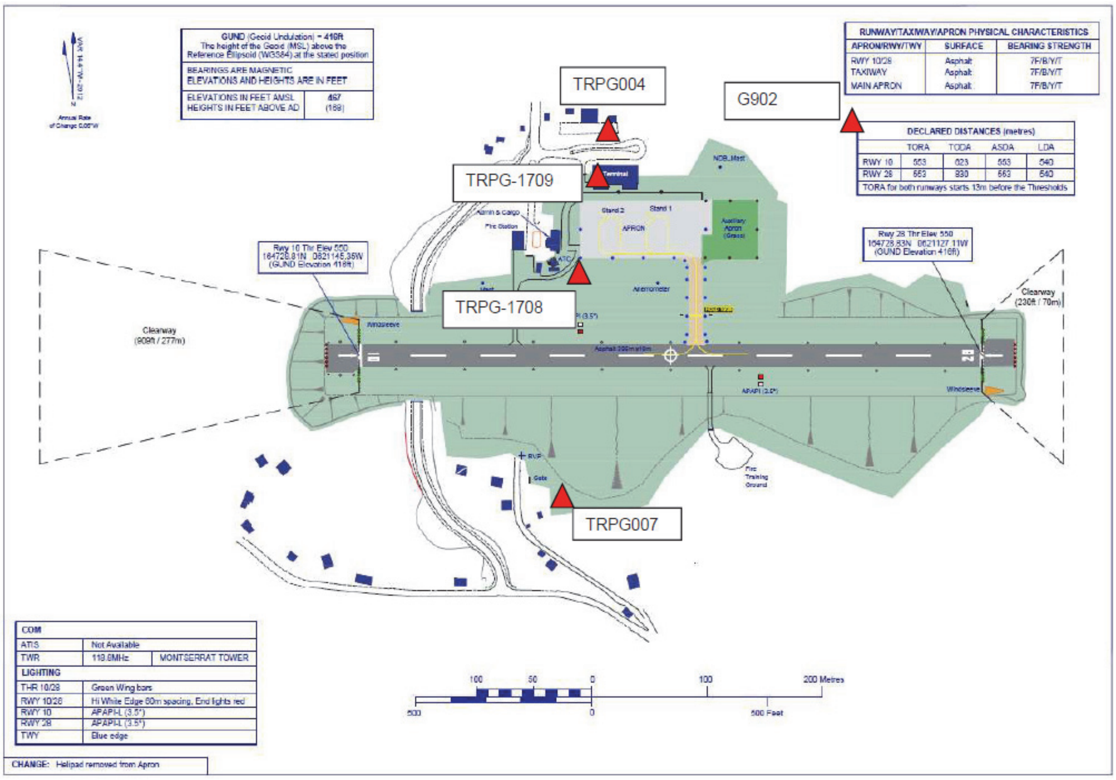


**Figure 5**

The Aeronautical Information Publication chart for
Montserrat, John A Osborne Airport

A significant aspect of the airport and its surroundings is the graded, downslopes at both ends of the runway, which in the event of an overrun have the potential to cause damage to an aircraft and injury to those onboard. Runway 28 has a clearway of 277 m and an open departure towards the sea; Runway 10 has a clearway of 70 m over a ravine, at the end of which is a hill rising to 67 ft above the threshold elevation, 350 m from the end of the runway.

The airport is affected by variable wind direction and the resulting turbulence from the surrounding terrain, hence the steep approach angle of the PAPIs on Runway 10 and the stringent pilot qualification requirements for operating there.

Figure 6 shows the airport from south-west of the Runway 10 threshold end, revealing the proximity of the graded bank to the runway end and the hill at the far end.

**Figure 6**

Montserrat John A Osborne Airport looking towards the north-east

*Runway condition*

The runway has an asphalt on concrete surface 596 m long and 18 m wide. Over most of the runway surface the asphalt has been applied uniformly but showed evidence of mis-application and wear in some areas, examples of which are shown in Figure 7.

Airfield staff carry out regular runway surface friction testing in accordance with the maintenance policy using a friction test trailer (Grip Tester GT625) towed behind a large pick-up truck. The testing is done at 65 km/h along the landing distance available (LDA) on the runway. The Grip Tester produces data which is shown on a colour coded friction map, with runway friction characteristics shown as blue, green, yellow or red blocks on the map (Figure 8).

At the time of the accident the runway surface was described as 'wet', which is defined as the surface being soaked but with no standing water. Observers who visited the scene of the accident later in the day whilst the runway was still damp, described some of the areas at the ends and edge of the runway as "slippery under foot".


**Figure 7**

Examples of areas of surface degradation on the runway

Figure 8 shows that the runway surface friction varied over its length. ICAO Annex 14 - *'Aerodromes'*, Section 10.2.5 states that:

> *'Corrective maintenance action shall be taken to prevent the runway surface friction characteristics for either the entire runway or a portion thereof from falling below a minimum friction level specified by the State.'*

Guidance for evaluating runway surface conditions is contained within ICAO Doc 9137, Airport Services Manual Part 2. The numerical results from the friction test trailer towed at 65 km/h should be interpreted against the figures set out in Table 3-1 of this manual and are as follows:

- Minimum design objective for a new surface 0.74
- Maintenance planning level 0.53
- Minimum friction level 0.43

(These band are not the same as those in the colour key produced by the Grip Tester)

The test on 24 September 2019 showed that 54% of the surface was 'green' with a reading of above 0.63. There was insufficient information available to determine how much, if any, of the surface was also above the minimum design objective level of 0.74. 31% of the surface was 'yellow' with a reading between 0.55 and 0.63, indicating that it was above the minimum of 0.53 below which corrective maintenance activity should be considered. 15% of the surface was 'red' between 0 and 0.55. There was insufficient information available to determine how much of that surface was below the 0.53 maintenance planning level, and how much was below the minimum friction level.


**Figure 8**

Runway surface friction map (24 Sep 19) and colour key

Overseas Territories Aviation Circular (OTAC) 139-23 – *'Runway pavement characteristics and maintenance'*, issued on 15 January 2020, states:

> *'7.1 The aerodrome operator should review the results of each runway friction assessment and take the following action.*
>
> - *If the friction level value falls below the Maintenance Planning Level, maintenance should be arranged to restore the relevant friction level to a value greater than the Maintenance Planning Level or ideally, to a value equal to or greater than the Design Objective Level.*
> - *If the friction level value falls below the Minimum Friction Level, maintenance should be **urgently** arranged in order to restore the relevant friction level value at least to a value greater than the Maintenance Planning Level and, ideally, to a value equal to or greater than the Design Objective Level.*
> - *If the friction level value falls below the Minimum Friction Level it is important that pilots are warned that aircraft performance calculations may no longer be valid. In this case the aerodrome operator must issue a NOTAM advising only that the runway may be slippery when wet.*
> - *If a runway friction assessment indicates that the friction level falls below the Maintenance Planning Level or the Minimum Friction Level, the aerodrome operator should increase the frequency of runway friction assessments in order to enable any further or rapid deterioration of the runway surface friction characteristics to be identified and, if appropriate, for additional action to be taken.*
> - *If a runway friction assessment falls below the Minimum Friction Level and remedial action cannot be conducted urgently the aerodrome operator should consider withdrawing the runway from use for take-off and/or landing.'*

OTAC 139-23 states that *'The friction level values produced by different CFME vary slightly for any given runway surface friction characteristics.'*

Given the runway surface condition there was a plan to resurface the runway in the future. At the time of the event, the runway had a NOTAM in place warning pilots that the runway may be slippery when wet. Pilots were asked for their impression of the braking action on each landing and these assessments were logged with ATC.

*Aerodrome rescue services*

The airfield usually provides a Category 2 RFFS during Islander operations. The RFFS has two fire appliances, a Category 2 tender and a Category 5 tender[3]. At the time of the accident the Category 5 tender was unserviceable awaiting spares. Twin Otter aircraft occasionally operate at the airfield and require an enhanced fire and rescue capability. This is achieved by an additional fire fighter who is 'loaned' from the civil fire service based in the nearby town of Brades.

When an incident or accident occurs, regardless of the aircraft type, the airfield fire service receives backup from the civil fire service, which automatically deploys a tender. This was the case for the VP-MNI accident response.

## Organisational information

The aircraft departed the level surface of the airfield and moved backwards down the vegetation covered slope at the end of Runway 10, adjacent to the Runway 28 threshold. This area is considered 'Difficult Environs' within the meaning of ICAO Annex 14, which states the following concerning the content of the Airport 'Emergency Plan':

> *'Emergencies in difficult environments*
>
> *9.1.14 The plan shall include the ready availability of, and coordination with, appropriate specialist rescue services to be able to respond to emergencies where an aerodrome is located close to water and/or swampy areas and where a significant portion of the approach or departure operations takes place over these areas.*
>
> *9.1.15 Recommendation.- At those aerodromes located close to water and/or swampy areas, or difficult terrain, the aerodrome emergency plan should include the establishment, testing and assessment at regular intervals of a predetermined response for the specialist rescue services.*
>
> *9.1.16 Recommendation.- An assessment of the approach and departure areas within 1,000 m of the runway threshold should be carried out to determine the options available for intervention.*
>
> *Note.- Guidance material on assessing approach and departure areas within 1,000 m of runway thresholds can be found in Chapter 13 of the Airport Services Manual (Doc 9137) Part 1.'*

**Footnote**

[3] OTAR Part 139 and ICAO Annex 14 sets out the categories of rescue and firefighting services required by an aerodrome. Category 2, required for aircraft from 9 m to 12 m in length, involves a fire tender with three crew and capable of delivering foam at 370 lt/min.

ICAO Document 9137, *The Airport Services Manual,* Part 1, Chapter 13 states:

> *'Consideration should be given to the following:*
>
> *a) provide direct access to the operational runway(s);*
>
> *b) designate access routes to the response area (consider debris and casualties);*
>
> *c) maintenance of roads and access routes (including construction activities);*
>
> *d) mitigate the possibility of any public and/or private non-emergency vehicle blocking the progress of responding emergency vehicles;*
>
> *e) take into account the gross weight and maximum dimensions of the RFFS vehicle(s) expected to use them; or any other responding vehicles;*
>
> *f) that roads are capable of being traversed in expected conditions;*
>
> *g) exit/access gates or frangible sections in the security fence that are constructed to allow RFFS vehicles to safely pass through with minimal delay;*
>
> *h) exit/access points will need to be clearly identified. Retro-reflective tape or markers will be of assistance where the aerodrome may need to be accessible during the hours of darkness or conditions of low visibility;*
>
> *i) the mitigation of impediments to RFF vehicle mobility; and*
>
> *j) provide sufficient vertical clearance from overhead obstructions for the largest RFFS vehicle/s.'*

*Airport Emergency Plan*

Chapter 3 of the Airport Emergency Plan for John A Osborne Airport sets out procedures for responding to an accident within the 1,000 m 'Difficult Environs'. An exercise of the airport Emergency Plan is held every two years, involving the emergency service and other stakeholders.

Included in this chapter are the actions required of the RFFS, which includes:

> *'3.2.2 Airport Rescue and Fire Fighting Service shall:'*
>
> > *'a) Proceed via the most suitable access routes to the off-airport accident site in co-ordination with the police responsible for ingress and egress roads;'*

Whilst the airport area is level and accessible to vehicles and fire and rescue personnel, the surrounding area within the 1,000 m requirement has differing levels of access. Regarding a runway overrun, as with this accident, both the undershoot areas for Runway 10 and 28 thresholds have steep inclines of about 45˚ in places.

The Runway 10 undershoot can be reached from the airfield boundary from above and by vehicles accessing the base of the slope from below. There are various level or gently sloping areas navigable by RFFS vehicles, and access roads in the immediate area of the base of the slope. The Runway 28 undershoot has a ravine, some 260 m across, and is more difficult for vehicle access, which is limited to the level area of the airport and possibly as far as the security fence. Any other access to the ravine would be by rescue and firefighting personnel only, with hand carried equipment. Figure 9, shows the airport runway (North is at the top of the figure) with the yellow centrelines extending 1,000 m from each runway threshold.


**Figure 9**

John A Osborne Airport, showing centrelines extended 1,000 m from each runway threshold

This investigation has focussed on an aircraft in the landing or abandoned takeoff phase of flight being unable to stop in the remaining distance available[4].

*Previous accident*

On 17 April 2011, VP-MNI was also involved in a landing accident, which on that occasion was due to failure of the right brake system. The runway was dry and the touchdown

**Footnote**

4 The BN2A Islander is a Performance Group B aircraft and no accelerate/stop distance information is provided in the Flight Manual.

normal, but when the pilot applied the brakes, there was no resistance from the right brake pedal. The pilot tried pumping the right brake pedal, but it had no effect on the right brake. To avoid departing the end of Runway 10, the pilot applied full left brake and allowed the aircraft to veer left onto the grass alongside the runway where it struck a low bank at low speed and came to a stop.

## Personnel information

The pilot commenced flying training in Trinidad and was issued with a PPL/A in November 2013, then completed a Professional Pilot's course and was issued with a CPL/IR. From November 2015 until joining the current operator the pilot operated light twin engine Piper Seneca III and Cessna 421 aircraft on inter island flights around the Caribbean. In November 2018 the pilot was issued with a Montserrat Certificate of Validation and commenced line training as a First Officer (FO) with the Montserrat based operator. After completing all the requirements for operating from John A Osborne Airport the pilot flew 172 hours as an FO before a transition to aircraft commander was completed on 4 May 2019, after another 45 hours flight time. At the time of the accident, the pilot had flown 445 hours on multi piston-engine aircraft.

## Other information

*Aquaplaning*

Aquaplaning is a phenomenon which affects tyre grip on a surface where standing water is present having a 1 mm or greater depth over the entire surface or where there are multiple areas of puddled water.

Aquaplaning occurs at higher speeds when the weight of the aircraft becomes wholly supported by the dynamic reaction of water so the tyre rolling surface loses contact with the ground and instead rides on the surface of the water. In this situation braking and steering are significantly affected, and loss of directional stability and control is highly likely. The speed at which it occurs is a derivative of tyre pressure and a numerical constant; for a rotating wheel, $V_a=9\sqrt{p}$ and for a non-rotating wheel, $V_a=7\sqrt{p}$. $V_a$ is in knots and p, tyre pressure, is in pounds per square inch (psi).

Calculations for this aircraft type, based on the normal tyre pressure of 35 psi, show that the minimum aquaplaning speed for a rotating wheel is 53 kt. For a locked non-rotating wheel, it is 41 kt.

## Analysis

*Operations*

Before departing Antigua, the pilot had reviewed the weather and had planned to remain clear of Montserrat in VMC until the rain shower had passed. The aircraft was being operated within the permitted maximum landing weight and was fully configured for the landing on Runway 10, which with the wind passed by ATC of 210° at 6 kt, gave a small tailwind component of about 2 kt. The LDR was 515 m and the LDA was 540 m with no head or tailwind component. The pilot's recollection was that the approach airspeed was indicating about 65 KIAS with no reduction to the threshold speed of 58 KIAS, but the touchdown groundspeed determined from the control tower image recording was 79 kt. At that speed on a wet runway, the LDR would have increased significantly and when combined with skidding, led to the aircraft overrunning the end of the runway. The pilot was aware of the hazard presented by the ravine and made a positive turn to the right in an attempt to avoid it. This succeeded in turning the aircraft around and probably reducing the speed at which it left the level surface of the airport and entered the downslope. The descent was then arrested by the security fence preventing further movement and possible damage. The pilot of the aircraft involved in the 2011 right brake failure event responded similarly, and on that occasion avoided overrunning the end of the runway by turning left, probably because only the left brake was working.

Due to its elevated position and the surrounding terrain, the airport does present significant challenges due to the local variation in wind direction and strength, which may have contributed to the accident. Therefore, the following Safety Recommendation is made:

**Safety Recommendation 2020-014**

It is recommended that Air Safety Support International Ltd ensure that pilots and operators intending to use John A Osborne Airport take account of local wind variations, and require operators to demonstrate how they will achieve this.

*Aircraft systems, wheels tyres and brakes*

The damage sustained by the aircraft during the accident is consistent with it skidding off the paved area of the runway onto the grass and being arrested by the bushes, reeds and the airfield perimeter fence. The landing gear, wheels, brakes and tyres were in good condition and operated correctly in accordance with the demands made by the pilot.

Of note was the avionic unit unshipping from its rack. The sudden rearward deceleration as the aircraft was brought to a stop and the 30° angle it came to rest, caused it to release from its rack within the instrument panel. The absence of apparent damage to the nav-comm unit rack and locking screw, suggest that the locking screw may not have been correctly engaged. Although this was undesirable, it only manifested itself as an issue in the unusual circumstances of this accident and is therefore not of any consequence.

*Runway surface*

The Grip Tester map (Figure 8) shows that the friction characteristics of part of the runway may have been below the maintenance planning level or below the minimum friction level, especially to the right of the centre line on Runway 28 adjacent to the ‘28’ marking. Surface friction was not uniform and the surface preparation was wearing out, so plans were in place for resurfacing. A NOTAM was issued warning pilots the runway may be slippery when wet

*Landing and skidding*

The evidence derived from the CCTV recording shows the aircraft to be landing at 79 kt. On landing the wheel brakes were applied but were ineffective. The tyre marks on the runway, the very faint white tyre edge lines, show the tyres were locked and skidding on the tarmac surface. They were generating enough heat to scald and blister the vulcanised rubber of the tyres. The tyres were therefore in contact with the surface and created superheated steam from the moisture present hence the white marks. This evidence leads to the conclusion that the aircraft was skidding but not aquaplaning but is consistent with the description of the runway being 'wet'.

Skidding was inevitable when the aircraft touched down at this higher than normal speed, at which a significant proportion of the aircraft weight is supported by wing lift. Therefore, contact pressure exerted by the tyres on the runway is greatly reduced. This probably remained the case until such time that the speed reduced to below approximately 50 kt but by this time, the aircraft would had travelled further along the runway all the time encroaching on the required stopping distance. In this situation the distance travelled was made worse by the reduced retardation produced by a locked and skidding tyre rather than a rotating tyre under braking.

*Rescue and location*

Due to the topography of the airfield location, the land falls away steeply at the runway ends. This aircraft travelled down the 45° slope at the end of the runway and was brought to a stop by the vegetation and fence. Had this not been the case the aircraft could have travelled a considerable distance further down into the ravine. The forces on the aircraft and its occupants could have been significantly higher and may have led to more significant damage to the aircraft and increased the risk of fire had the fuel system been compromised.

Immediate rescue would have been much more difficult due to the potential problems in accessing the aircraft. The two fire appliances at the airfield do not have the capability to be driven down into the ravine. Therefore, they would have to apply foam firefighting media from above with a risk that it would not reach or be affective on a crashed aircraft.

In the scenario, getting to a crashed aircraft on foot is potentially difficult and in the case of an aircraft fire, would put those individuals trying to approach the aircraft in a dangerous position. This is because the escape route for rescuers and injured survivors would be made difficult or even prevented by the overgrown and steep terrain.

The steep slopes and terrain at each end of the runway present significant hazards to an aircraft if it fails to stop in the distance available. Significant damage is possible, with the associated risk of fire and injury to those onboard. Dense vegetation and difficult terrain present the airport RFFS with considerable difficulty reaching a crashed aircraft in the immediate undershoot area of the Runway 28 threshold and may cause significant delay in rescue and firefighting operations. Access to the ravine beyond is severely restricted, with no roads available for RFFS vehicles. Accordingly, the following Safety Recommendation is made:

**Safety Recommendation 2020-015**

It is recommended that the operator of John A Osborne Airport provide adequate access to the Difficult Environs at the east end of Runway 10 to ensure that emergency services can reach expeditiously the location of an aircraft which has overrun the end of the runway.

Whilst the immediate area of the Runway 10 undershoot has better access for RFFS, the risk of serious damage, fire and injury to those onboard an aircraft departing during a landing or abandoned takeoff, is the same for both ends, indicating that it is necessary to limit the progress of an aircraft that is unable to stop in the distance available. Therefore, the following Safety Recommendation is made:

**Safety Recommendation 2020-016**

It is recommended that the operator of John A Osborne Airport install a means of arresting the progress of an aircraft that has overrun either end of the runway in order to minimise the risk of injury to those onboard and to ensure that emergency services can reach them expeditiously.

## Conclusion

There were no faults or malfunctions of systems or equipment within the aircraft contributory to this accident. It appears that either increased airspeed over the normal approach speed of 65 kt was used or a significant change in windspeed and direction led to an increased tailwind component, causing a touchdown groundspeed of 79 kt. This, combined with a wet runway and skidding, greatly increased the LDR beyond that available and led to the overrun.

Safety recommendations are made regarding aircraft operations at John A Osborne Airport, access for rescue and firefighting vehicles, and a means of arresting aircraft that overrun the runway.

*Published: 21 May 2020.*