ARGUS PRISM

A member of the SGS Group

FIXED WING NEWSLETTER

November 2023 | Volume XXIII | Issue XI

SAFETYWIRE

Pilots Should Study Runway Condition Reports, Part 1

(Source:Patrick Veillette, Ph.D. August 23, 2023 , Aviation Week Network)

Business aviation aircraft operate into a wide spectrum of airports that sometimes can lack credible sources of information regarding runway conditions.

Snowy runways, low ceilings and a crosswind landing are threats that a prudent flight crew will take seriously. Now add a runway distance that is barely marginal if the subjective braking action reports are “good,” and the situation turns into one in which every decision and action by the flight crew needs to be “spot on.”

To further heighten the risk, let’s put a body of water at the boundaries of the marginal length runway. That was the situation faced by the flight crew of Delta Flight 1086, a McDonnell Douglas MD-88, as it approached New York’s LaGuardia airport (LGA) on the snowy day of March 5, 2015.

The flight left Atlanta that morning for the flight to LGA. While en route the flight crew continued to monitor the weather conditions at LGA and assessed the factors that could affect stopping performance. They closely examined company policies for landing on contaminated runways and understood that a change in runway conditions from accumulating snowfall could increase the landing distance and that a change in wind could cause the flight to exceed crosswind limits.

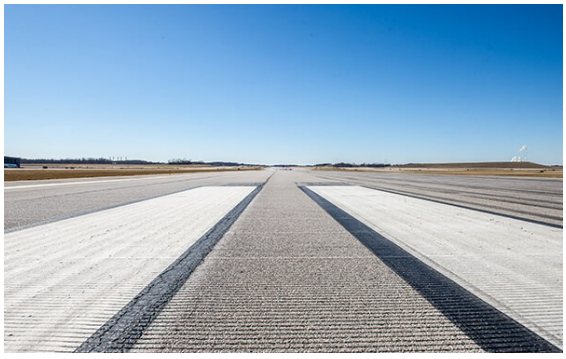
6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111
+1 513.852.5110
+1 800.361.2216
argus.sales@argus.aero

The flight crew asked the dispatcher and the Washington Air Route Traffic Control Center controller for braking action reports, but neither had any reports at the time because LGA operations personnel were conducting snow removal operations and no aircraft were landing. The four previous ATIS reports (issued between 07:51 and 10:24) contained outdated and contradictory field condition information about the status of LGA's runways. Besides company and ATIS reports, ATC communications as late as 10:40 gave the impression to the flight crew that at least some patches of runway surface would be visible upon breaking out of the IMC on the approach.

But upon first seeing the runway in sight at 233 ft. AGL, the runway appeared white. This was contrary to their expectations given the recent snow cleaning operations and the reports of good braking action by two of the four preceding aircraft. Only 13 seconds elapsed between the time the captain called the runway in sight and the 50 ft. automated call-out, during which the flight crew intensely focused on precise control of the aircraft. It would have been difficult for the crew to visually assess the nature and depth of the snow on the runway.

A combination of factors resulted in the MD-88 veering off the runway, coming to rest with the nose of the aircraft over the berm above Flushing Bay. There were no fatalities, but 24 people were injured.

While the bulk of the official NTSB accident report focused on a phenomenon called rudder blanking, the accident amply illustrates the consequences when the actual runway environment differs from the reported conditions. Accurately predicting the effects of wind, temperature and runway surface conditions are vital to every takeoff and landing. Standard practice in the aviation industry expects a pilot to dutifully enter the performance charts for these parameters to calculate the aircraft's performance. Yet there are many reasons why the actual runway environmental conditions can vary significantly from the reported values.



The situation is amplified for business aviation aircraft that operate into a wide spectrum of airports, most of which are non-towered and have limited resources for runway snow removal. The runways often do not include features such as crowning, grooves and porous filled concrete to minimize the pooling of water that exist on runways serving scheduled air carriers.

FBO personnel likely have little training on the accurate assessment of braking action from the perspective of an aircraft's needs. Furthermore, transitory phenomena such as the melting action from daytime sun on snowbanks adjacent to a runway can result in a liquid that turns into black ice after sunset and will not be readily apparent.

6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111
+1 513.852.5110
+1 800.361.2216
argus.sales@argus.aero

There is potential for strong vertical turbulence at the edge of the mesa collocated with the threshold of Telluride's Runway 09. Credit: Kim Henneman

Winds At The Threshold

Some of business aviation's most glamorous locations are surrounded by significant landscape that creates its own micro-climate. Notable domestic U.S. examples are Aspen, Eagle, Telluride, Gunnison, Sun Valley, Truckee, and Jackson. European examples include Gstaad, Samedan (St. Moritz) and Courchevel. These are considered some of the most challenging airports in the world because of their difficult topography, winds, and high altitude.

The micro-climate effects produce rapidly changing localized winds that won't be detected by an airport's AWOS. Adverse winds caused by mountain wave, diurnal "canyon" winds or convective activity can create downdrafts of significant strength.

Localized winds just short of the landing threshold can cause negative effects on an aircraft's stability, control, and performance. Even minor variations in vertical currents as the aircraft is precariously transitioning into the landing flare can cause the aircraft to balloon or dive markedly from the desired glide path. A sudden loss of headwind from windshear can cause the aircraft to nose down and temporarily lose important airspeed.

6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111
+1 513.852.5110
+1 800.361.2216
argus.sales@argus.aero

These effects can be even more pronounced when a runway's threshold is close to vertical terrain. A classic example would be the cliff adjacent to the threshold of Telluride's Runway 9. As the sun's angle moves across the sky and begins to heat that slanted terrain, the air immediately adjacent to the cliff begins to heat and rises rapidly in a thermal.

For those without the benefit of a soaring background, thermals are rising parcels of air that continue to rise as long as the surrounding air is cooler. It is not uncommon for the strength of the cores of these thermals to exceed 2,000 fpm in the western states. Conversely, the outer portion of these rising bubbles (imagine the shape of a doughnut, with the middle rising and the outside descending) can be nearly as strong.

Aircraft control and flight path maintenance can instantly be compromised by these sudden and surprisingly strong vertical air currents. Incidentally, there is a warning for pilots that the Telluride airport sits on a 1,000-ft. mesa, with the precaution of strong vertical turbulence along the mesa's edge.

The wind environment close to the approach end of the runway can change rapidly, we explain in Part 2 of this article.

Patrick Veillette, Ph.D.

Upon his retirement as a non-routine flight operations captain from a fractional operator in 2015, Dr. Veillette had accumulated more than 20,000 hours of flight experience in 240 types of aircraft—including balloons, rotorcraft, sea planes, gliders, war birds, supersonic jets and large commercial transports. He is an adjunct professor at Utah Valley University.

6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111

+1 513.852.5110
+1 800.361.2216

argus.sales@argus.aero

Deciding Too Late To Go Around, Part 1

(Source: Roger Cox October 10, 2023, Aviation Week Network)

Left side of the airplane after it collided with trees.

Credit: NTSB

The pilot of a Cape Air Cessna 402C expected to be able to stop when he landed at Provincetown, Massachusetts, on a fall day in 2021. The runway was short and rain was falling, and after he landed, the pilot decided to go around. He didn't have a plan for what to do if it looked like he couldn't stop, and he made the wrong decision. The twin-piston airplane, registered N88833, was wrecked and all seven people onboard were injured, some quite seriously. Cape Air didn't have a policy to help the pilot make the decision at that time. It does now.

The NTSB had recommended a "commit-to-stop" policy in 2011 after a Hawker Beechcraft 125-800A twinjet crashed in Owatonna, Minnesota. The pilot of that aircraft hesitated far too long after landing before attempting a go-around, and the jet was destroyed when it hit the localizer antenna at high speed. The idea of a commit-to-stop policy is to predetermine the latest point during landing when a go-around may be attempted.

6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111

+1 513.852.5110
+1 800.361.2216

argus.sales@argus.aero

The accident involving Cape Air Flight 2072 took place on Sept. 9, 2021. It was a scheduled Part 135 commuter flight from Boston Logan International Airport (BOS) to Provincetown Municipal Airport (PVC) on Cape Cod. The straight-line distance from BOS to PVC is only 39 nm, so the flight was short. The veteran pilot knew the weather conditions at PVC were limiting. The only suitable approach was the ILS to Runway 7. With a 200-ft. overcast covering and visibility of 3-to-4 mi. in moderate rain, he could not land into the wind, which was 5 kts or less from the southwest when the flight departed. He would be landing with a light tailwind.

The flight departed BOS at 1504 EDT. It headed south before turning southeast. At 1511, the pilot told air traffic control that he had the weather at PVC and could accept the ILS RWY 7 approach. ATC cleared him to proceed direct to the WOMECK intersection and then, at 1513, cleared him for the ILS approach. FAA radar surveillance data showed that the airplane crossed the final approach fix (FAF) at 1524, at an altitude of about 2,000 ft. msl, and landed about 3 min. later, at 1527.

A low-pressure system and associated cold front was moving across Massachusetts with moderate to heavy rain and thunderstorms across the region. There was a current convective SIGMET weather advisory over the route of flight and destination airport, but there was very little potential for windshear or microburst activity.

The pilot, who was first interviewed Oct. 1 due to his injuries, said he left the autopilot engaged until crossing the FAF, then turned it off and lowered the landing gear. With flaps partially extended, he slowed gradually and broke out of the clouds at 500 ft. He saw the airport's runway lights and noticed that rain was falling. At about 300 ft. above the ground, he extended the flaps to 45 degrees. The airplane encountered "an aggressive sinking tendency" and "very heavy rain" at 50-to-100 ft. above the ground. It was the pilot's recollection that he initiated a go-around before the airplane touched down.

He remembered touching down for only about two seconds and did not remember applying the wheel brakes. During the go-around, he was unable to establish a positive rate of climb and the wings were buffeting. The airplane struck a cluster of pine trees about 660 ft. from the departure end of the runway. It then crossed a two-lane road, impacted the ground and more trees before coming to rest. A fire broke out that consumed most of the left wing and a portion of the right wing.

The pilot and all six passengers suffered extensive burns as well as broken bones and other injuries. No one used the emergency exit on the right forward part of the fuselage. They all left the airplane by squeezing through the top half of the main cabin clamshell door on the left side of the airplane in the rear cabin area. Because the airplane was in a nose-down attitude, they each had to jump about 9.5 ft. to the ground. The pilot, who was about to exit, went back and released one passenger's lap belt and helped her exit the airplane.

6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111
+1 513.852.5110
+1 800.361.2216
argus.sales@argus.aero

Several private vehicles and park rangers came to the site and assisted the injured until ambulances could arrive.

A fireball erupted following the collision with trees. Credit: NTSB

The Investigation

The NTSB conducted a Class 3 investigation of the accident. Investigators from the FAA, Textron Aviation and Cape Air participated. The safety board issued a final report on Aug. 15, 2023, just under two years after the accident. Class 3 investigations allow for safety messages, recommendations, or strategies to avoid future accidents, but none were issued.

Three interviews done by an investigator in the first week after the accident helped frame the issues. The first was an interview with a Cape Air pilot who witnessed the accident. He had about 20,000 hr. in the Cessna 402 and had been a Cape Air employee for 23 years. He had just come from BOS, discharged his passengers, and was waiting at the far end of Runway 27 for takeoff. He spoke with the accident captain on the Unicom frequency as that flight was inbound to the airport. He reported that the runway lights were on, the visibility had improved, and the rain was subsiding.

6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111
+1 513.852.5110
+1 800.361.2216
argus.sales@argus.aero

The pilot witness first saw the airplane after it had landed and was on the landing rollout, about halfway down the runway. He thought it was moving “a little faster than it should be.” When the airplane took off, it was climbing slower than he thought it should. He saw the airplane clear the localizer antenna and disappear into the trees, then saw a ball of flame erupt. He called fire rescue and ATC, then taxied back to the gate, shut down and called Cape Air’s duty officer. The pilot witness did not see any pooling of water on the runway and had never had an issue with hydroplaning at PVC.

He mentioned that Cape Air prohibited instrument approaches to short runways (4,000 ft. or less) when the tailwind component was 5 kts or more, and he had been careful to observe that rule when he landed at PVC that day.

Contrary to his recollection, the pilot had first attempted to brake before commencing a go-around, we report in Part 2 of this article.

Roger Cox

A former military, corporate and airline pilot, Roger Cox was also a senior investigator at the NTSB. He writes about aviation safety issues.

6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111

+1 513.852.5110
+1 800.361.2216

argus.sales@argus.aero

SAFETY MANAGER'S CORNER

Why Safety Promotion?

Safety promotion is an important part of an SMS (one of the four pillars), setting the tone for the organization, and helping to build a robust safety culture while helping to achieve your safety objectives. Safety promotion also helps to foster improved safety performance by communicating lessons learned, broader safety information and the distribution of the SMS manual as well as safety procedures in the organization. The promotion of safety must be recognized as a "core value" within an organization and its management team must always demonstrate its commitment to safety. Your success is directly proportional to the effort your managers put forth – there is no capacity for "lip service". It goes well beyond simply handing out safety awards. Understanding the overall objective and how each employee's role contributes in assuring hazards are identified, risks assessed and effective mitigations are developed and implemented are integral components in establishing a safety oriented culture.

Effective Safety Promotion in an organization includes:

- Promoting a Positive Safety Culture
- Management Involvement
- Personnel Competency and Training
- Communication

One of the easiest ways for managers to discuss the importance of safety on the job is through short safety briefings, or "toolbox talks". You don't have to be a professional speaker to do this well. These are typically done weekly, at the beginning of the work day or at a shift change. Keep the talk informal, limit the length of your discussion, invite your people to participate and encourage them to help suggest possible solutions to issues identified. Choose topics related to recent developments at your organization and pertinent to the work tasks your employees perform. You will find that these toolbox talks are an excellent method to engage your workers and identify (and resolve) real safety related issues within your organization.

Through safety promotion an organization adopts a culture that goes beyond merely avoiding accidents or reducing the number of incidents, although these are likely to be the most apparent measures of success. It is more to do the right thing at the right time in response to normal and emergency situations. Effective safety promotion sets the tone that predisposes both individual and organizational behavior and fills in the blank spaces in the organization's policies, procedures and processes, providing a sense of purpose and direction.

6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111
+1 513.852.5110
+1 800.361.2216
argus.sales@argus.aero

Quote of the Month

“You can't stay in your corner of the Forest waiting for others to come to you. You have to go to them sometimes.”

— A.A. Milne, Winnie the Pooh

Safety promotion is often times overlooked. But communication of an effective SMS is a foundational core principle. Without the buy in from a work group, you’ll never achieve a pro-active system. To get buy in you must leave your corner of the forest and go to theirs. Show them how the system works, and most importantly, show them that you care. When they feel like you have their backs, that you’re fighting for their benefit, that’s when you’ll get the buy in.

On Short Final...

Well folks, the call of the wild blue yonder is loud and pervasive. It has been my distinct pleasure to work with all of you, and the mission is one I truly believe in. It is with heartfelt gratitude I thank my team, and the most sincere best wishes to all of the safety departments we work with, I bid adieu….. “Eeyore” Signing Off!

6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111

+1 513.852.5110
+1 800.361.2216

argus.sales@argus.aero

CONTACT LIST

Susan Cadwallader
susan.cadwallader@prism.aero
VP,SMS Services

Jenna Albrecht
Jenna.albrecht@prism.aero
Program Manager, SMS Services

Wayne Ehlke
Wayne.Ehlke@prism.aero
Safety Analyst, SMS Services

ARGUS PRISM
A member of the SGS Group

6021 S. Syracuse Way, Ste 302
Greenwood Village, CO 80111
www.argus.aero

UPCOMING COURSES

Nov 14 to Nov 16, 2023—PROS Course
V-ICAT Training
Virtual

Go to Upcoming Training Classes to register.

+1 513.852.5110
+1 800.361.2216
argus.sales@argus.aero