ARGUS

PRISM

A member of the SGS Group

FIXED WING NEWSLETTER

December 2023 | Volume XXIII | Issue XII

SAFETYWIRE

Pilots Should Study Runway Condition Reports, Part 2

(Source:Patrick Veillette, Ph.D. August 24, 2023 , Aviation Week Network)

Acres of pavement with scant shade like this Rock Springs, Wyoming, air tanker base turns an airport ramp and runway into its own 'heat island.'

Credit: National Interagency Fire Center

What is the FAA criteria for the siting of a wind sensor? According to Order JO 6560.20C, “Siting Criteria for Automated Weather Observing Systems,” the preferred siting of the wind sensor at an airport with only a visual or non-precision runway is adjacent to the primary runway *1,000 feet to 3,000 feet down runway from the threshold.*

The author added the italics for emphasis. Clearly, these indicators are not able to accurately sense the shifting wind currents in the threshold of a runway such as Telluride’s Runway 9.

This type of rapidly-changing adverse wind close to the approach end of the runway was a contributing factor in the crash of a Socata TBM 700 on Feb. 15, 2003, at Aspen-Pitkin County Airport, Colorado. The approach was stabilized at 100 kts with landing gear and flaps in the landing position. The approach was normal until approximately 100 ft. above the runway at which time the airplane encountered a turbulence condition, causing rapid-roll tendencies right and left.

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

As the pilot began his landing flare at about 15 ft. above the runway, the left wing dropped rapidly combined with a sudden high sink rate and struck the runway. Fortunately, none of the four occupants of the aircraft was injured. Winds at the time were reported 310 deg. at 6 kts. Records suggest that the winds were variable throughout the day. The NTSB determined the pilots had failed to maintain aircraft control. Contributing factors include the tailwind and the turbulence.

What Really Is The Temperature At The Runway?

The heat on the ramp was unbearable while walking out to the aircraft on a hot August afternoon in Lincoln, Nebraska. ATIS was reporting 108 deg. F, but it felt much worse than that on the ramp.

Mechanics from Duncan Aviation walked out to the aircraft with their recently acquired infrared temperature detector. Their “temperature shot” from the cement showed a temperature of 127 deg. The blacktop was even worse. It showed 143 deg.

As per company operating procedures, our takeoff performance was calculated using the reported ATIS temperature. Fortunately, we had no passengers and only a modest amount of fuel for the post maintenance test flight. Normally the takeoff distance would be relatively short at that light weight and low altitude but the end of the runway seemed unusually close when we rotated for takeoff.

Months later I was flying with a colleague whose primary passion in life is competitive racing of high-performance automobiles. He informed me that the auto racing industry is cognizant of the difference between the race track’s temperature versus the reported air temperature. In fact, teams will purposely tune-up their engine performance in conditions as close as possible to the track conditions replicating the time of their race.

Certainly, this same principle applies to aircraft. When the temperature of the air at the height of our engines and wings is significantly hot, we should expect longer takeoff runs, anemic climb rates, higher speeds for takeoff, reduced engine longevity, and reduced climb gradients. Excessive temperatures will undoubtedly bake the tires and brakes during ground operations, increasing the risk of high speed tire failure and overheating wheel and brake assemblies

According to JO 6560.20C, the temperature sensor must be mounted so that the aspirator intake is 5 plus or minus 1 ft. above ground level or 2 ft. above the average maximum snow depth, whichever is higher. It can be placed at any convenient location on the airport that is protected from radiation from the sun, sky, earth, and any other surrounding objects, but at the same time, be properly aspirated.

6021 South Syracuse Way
Suite 301
Greenwood Village, CO 80111

+1 513.852.5110
+1 800.361.2216

argus.sales@argus.aero

The sensors must be installed in such a manner as to ensure that measurements are representative of the free air circulating in the locality and *not influenced by artificial conditions such as large buildings, cooling towers, and expanses of concrete and tarmac to minimize the effect that the underlying ground itself might have on temperature.*

I put those final words in italics for emphasis hoping that you might reach the same question I have. For the record, heat transfer is not within my engineering specialty. Many of you with soaring backgrounds will recognize the drawings in training manuals of the warmer air over heat-soaked ground to include large expanses of concrete or asphalt becoming more buoyant than air over adjacent grass-covered landscape and eventually rising as a thermal. This further reinforces my curiosity in the micro-scale temperature differences around an airport.

When will this adverse heat problem over the runway be most problematic? The amount of solar radiation absorbed by the ramp depends on various factors, such as the angle of the sun with respect to the ramp (the noontime sun directly overhead bombards the ramp with the highest ratio of sunshine), clear-vs-cloudy days, etc. Dark surfaces such as asphalt absorb more radiation than lighter colored surfaces, which tend to reflect some of the radiant energy.

It takes a lot of incoming radiation to "heat up" concrete, but once it does reach a warm temperature, it tends to retain that heat for quite some time.

Astute flight crews should scrutinize the possible sources of uncertainty when planning a takeoff or landing, we advise in Part 3 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 2

(Source: Roger Cox October 11, 2023, Aviation Week Network)

The right main landing gear tire showed areas of melted rubber.

Credit: NTSB

Following the crash of Cape Air Flight 2072, safety investigators interviewed the two passengers who had been seated directly behind the pilot and co-pilot seats. One passenger said the landing “felt smooth,” with no bounce. She said the brakes came on, the airplane slowed down, and there was a second heavier application of the brakes when she could feel her body shift forward.

After the tail end of the airplane moved left-right-then left, the captain added full power. The second passenger said it was raining heavily, and the airplane skidded and “fishtailed.” She said the airplane never slowed down.

When the wreckage of the Cessna 402C was examined, the right main landing gear tire showed two oval-shaped areas of melted rubber. When the tire was later examined at the NTSB’s lab, the technician said the marks were consistent with multiple skid events.

The evidence from the passengers and the tire indicated that, contrary to his recollection, the pilot had first attempted to brake before commencing his go-around.

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

Examination of the wreckage showed the airplane came to rest about 200 ft. beyond the point of its initial impact with trees. The flap indicator was at zero and the right flap was fully retracted. The left flap was too damaged to be measured. The landing gear was down at the time of impact. The engines were damaged in the crash, but investigators found no mechanical defects in them.

The airplane had two doors and an emergency exit. The pilot's door (crew door) was badly damaged. The emergency exit on the right side of the passenger compartment was open but had been too hot to use. The main door was a two-section, outward opening, airstair door on the left aft side. The top half was open, the bottom half closed. A 5-in. tree limb blocked the lower door half.

Provincetown Municipal Airport was not required to provide aircraft rescue and firefighting services under 14 CFR Part 139. It is a noncontrolled, publicly owned commercial service airport and has only a single asphalt runway. That runway is 3,502 ft. long by 100 ft. wide. Runway 7 is equipped with high-intensity runway edge lights, a medium intensity approach lighting system with sequenced flashers, and a 4-light precision approach path indicator (PAPI) system.

The 51-year-old pilot held an airline transport pilot certificate with a rating for airplane multiengine land. He was a certified flight instructor and had a current FAA first-class medical certificate. He had been employed by Cape Air for about nine years and reported a total of 17,617 flight hours, of which 10,000 hr. were in the Cessna 402C. He was also type rated in Boeing 727 and Beech 1900 airplanes.

The airplane was not equipped with a flight data or voice recorder. The absence of these recorders hampers investigators in many ways, but in this case, investigators were able to garner useful information from airport cameras, ADS-B data, and passenger statements.

The airplane's altitude, position, and speed during its approach to Runway 7 was computed from ADS-B data. Surveillance videos showed the airplane during the landing roll and go-around, and this was used to determine the position and speed of the airplane along the runway. It was also used to determine the elapsed time between touchdown and impact with the trees.

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

A High And Fast Approach

An aircraft performance study showed the airplane was slightly outside company stabilized approach criteria but correcting during the last 1,000 ft. of its approach. It was a bit high and fast. As the airplane decelerated, it ballooned to a dot high on the ILS and the pilot then exceeded 1,000 fpm while descending to get down to the glide path.

In addition, the tailwind increased as the approach progressed. The tailwind component increased from 3-to-4 kts. to 11 kts. at the time of landing. The airplane touched down about 500 ft. from the Runway 7 threshold at about 104 kts. ground speed, 18 kts. faster than the Pilot Operating Handbook speed for that weight.

The pilot was apparently unaware that the tailwind exceeded 5 kts. as he approached the field. If he had realized that the tailwind was excessive, company policy would have required him to discontinue the approach. Automated Weather Observing System data for the last three minutes of the flight showed the tailwind component increased from 6 to 11 kts. during that time.

A video study was also done. Two cameras recorded the landing and midpoint areas of the runway. A third was aimed at the departure end of the runway and recorded the airplane's collision with trees. Once the optics of the first two cameras were calibrated, a model of the airplane's motion along the runway was constructed and its speed and deceleration were calculated.

The airplane touched down 6.1 sec. into the first video and lifted off 21 sec. later. During that time, it decelerated at 0.16 g, slowing to 57.2 kts. at a point 896 ft. from the end of the runway. The deceleration is about half the value normally achieved on a dry runway and is typical of wet runway landings.

NTSB engineers calculated that if the pilot had maintained the same level of deceleration while remaining on the ground, he would have stopped the airplane and it is likely there would have been no injuries, in Part 3 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

U.S. Department
of Transportation
Federal Aviation
Administration

InFO

Information for Operators

InFO 23009
DATE: 10/13/23

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info/all_infos

An InFO contains valuable information for operators that should help them meet certain administrative, regulatory, or operational requirements, with relatively low urgency or impact on safety. The contents of this document do not have the force and effect of law and are not meant to bind the public in any way. This document is intended only to provide clarity to the public regarding existing requirements under the law or agency policies.

Subject: Operator Use of Airport Runway Obstacle Analysis Products.

Purpose: This InFO serves to remind Title 14 of the Code of Federal Regulations (14 CFR) part 135 operators of the requirements and authorizations necessary to use airport aeronautical data, including airport runway obstacle analysis products.

Background: Routine surveillance has revealed some part 135 operators are lacking proper authorization and/or sufficient knowledge, training, and checking on the use of airport runway obstacle analysis products and one-engine-inoperative (OEI) departure routing/procedures developed via methods such as described in Advisory Circular (AC) 120-91, Airport Obstacle Analysis and as authorized by Operation Specification (OpSpec) A009 – Airport Aeronautical Data.

Discussion: Subpart I of part 135 requires operators of large transport and commuter category airplanes to ensure net takeoff flight path obstacle clearance following an engine failure on takeoff. An acceptable means to meet these 14 CFR requirements is described in AC 120-91 (as amended). OpSpec A009 authorizes the use of aeronautical data, including airport runway obstacle analysis products described in this AC. Operators using such products must have OpSpec A009 issued and should provide sufficient training and checking on the application of airport runway obstacle analysis products furnished to flight crews, including the use of special OEI procedures.

It is important to note these airport runway obstacle analysis products are used to comply with the regulatory requirements stated in Subpart I, part 135. They are not an alternate means of compliance with climb gradients and altitude requirements published on instrument flight procedures. These requirements are based on all-engines-operating (AEO) Terminal Instrument Procedures (TERPS) criteria. For expanded reference pertaining to these differences, see InFO 18014 - Compliance with 14 CFR Part 97 IFR DPs and Missed App Climb Gradients.

Additionally, §135.83 states operators must establish checklists and procedures for addressing an engine failure in multiengine aircraft, including a failure during takeoff. These procedures should include any avionics setup required prior to takeoff that is necessary to comply with the OEI routing specified by the airport runway obstacle analysis. In addition, any OEI procedure should include an item in the takeoff briefing assigning the responsibility for avionics reconfiguring and how these procedures will be executed

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

(e.g., see FAA-produced video Planning for Takeoff Obstacle Clearance). Finally, these procedures should be incorporated into the operator's training requirements in accordance with §135.329 and checking requirements in accordance with §§135.293 and 135.297.

Recommended Action: Prior to requesting issuance of OpSpec A009 for acceptance of operator or contractor provided airport runway obstacle analysis products, directors of operations or flight operations managers should review expanded guidance in FAA Order 8900.1, Volume 3, Chapter 18, Section 3 for OpSpec authorization guidance and the Volume 4, Chapter 3, Section detailing Approval of Performance Data Sections of CFMs and/or Data Provided via Other Means for additional airplane performance and airport data guidance. Training managers and operators should ensure operator training manuals, curricula, Standard Operating Procedures (SOP), and/or General Operations Manuals address the safe implementation, distribution, and use of operator or contractor-provided aeronautical data and airport runway obstacle analysis products. Lastly, training managers and operators should ensure that flight crews understand the intended use of these products, any limitations, and how the pilot's pre-takeoff briefing and flight deck set-up could be affected by prescribed use of such products.

Contact: Questions or comments on policies and procedures related to training and qualification under parts 121, 135, 142, or OpSpec A009 should be directed to the Air Transportation Division at 202-267-8166. Questions or comments related to the application of performance data and procedures related to airport runway obstacle analysis should be directed to the Flight Technologies and Procedures Division at (202) 267-8790.

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

Smart Safety Reporting

If you have ever said or thought "Who cares what the report form looks like, as long as I get the reports," then it might be time to reconsider. Admittedly, obtaining a submitted safety report is the most important step in the process so let's not take anything away from that. Rather let's take a look at a bigger picture and focus on how smart information management leads to better safety data and more informed decision making.

Garbage in, garbage out; data can only do what you tell it to do; computers really are dumb machines that just follow instructions, etc. All truisms and very important concepts to understand when designing a safety report. You may have determined that a simple report format asking the submitter to identify a sort of macro hazard label and then provide a written description works best in your operation. However, it's important to realize what might become lost in safety data analysis terms. Let's chase down an example. Say you are interested in knowing how many unstabilized approach reports are contained in your safety data from the past two years, and moreover you would like to break the results into conditions of day or night and IMC or VMC. If your report format is similar to the simple type described above the data tally must be obtained by examining each flight report and looking for details describing unstabilzed approach, with further manual counting of day or night and IMC or VMC (assuming it's even listed in the description details). Additionally, you are relying completely upon the reporter including these specific details in the written portion of the submitted report; if not prompted for specifics these details might be missing. Manual analysis like this makes the safety manager job much harder.

The solution to effective safety data management starts with report construct; good info in, good info out. Build the safety reports so they contain searchable fields that discriminate hazard information important to your operation. Placing choice options like checkboxes or radio buttons allow for easy selection and enable accurate searches to sort data. Certainly a report can't nor shouldn't contain every possible hazard item, but it should contain significant ones. Think about the example described above and how a search would be greatly improved and simplified by sorting reports that had boxes checked for the values unstabilzed approach, night, and IMC. A simple search query looking for reports containing these three items would quickly yield the desired batch of data.

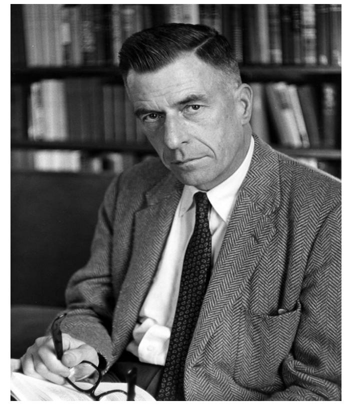
If placing more detail into your custom safety report is not the right option then consider developing a standard taxonomy you can place into the Admin section of the report to facilitate key word searching. For example, placing standard wording like "Taxi collision" into the corrective action area would allow you to key word search identify all reports pointing out this specific hazard, regardless of how the reporter chose to describe it in their written submission. Remember, getting the report is only a portion of the safety management process. Using information to prevent accidents and incidents is the primary objective.

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

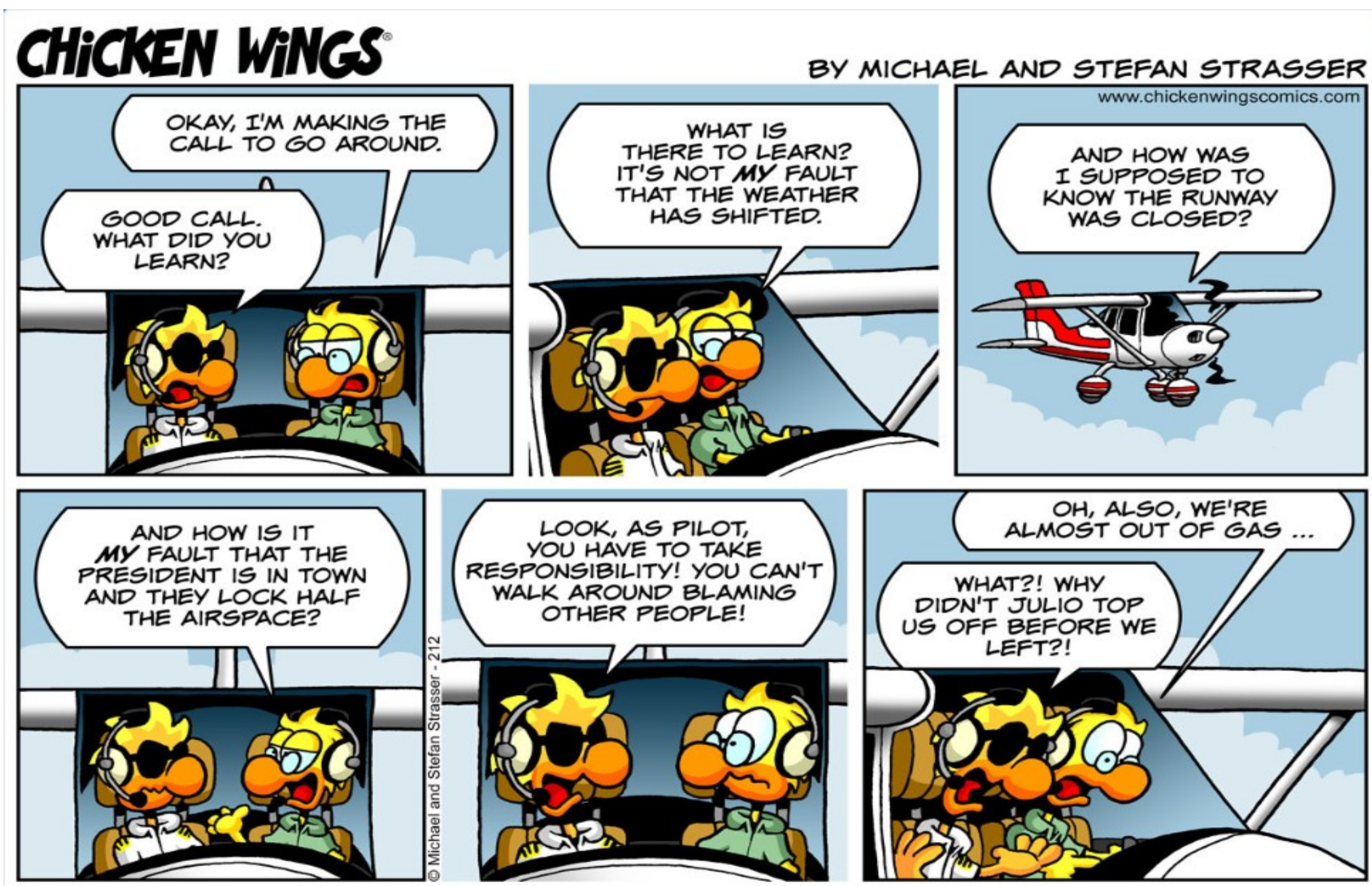
Quote of the Month

"If all else fails, immortality can always be assured by spectacular error."

— John Kenneth Galbraith



Even an economist understands aviation safety! Mr. Galbraith knew that proper planning and training provide an aviator with the tools needed to stay out of situations that can instigate infamy. Staying on the straight and narrow regarding procedures and training preserves proficiency, awareness, and competence. Be spectacular, for all the right reasons.



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

Jan 16 to Jan 18, 2024—PROS Course
V-ICAT Training
Virtual

Apr 2 to Apr 4, 2024—PRISM Course
Safety Management System (SMS)
Denver, CO

Go to Upcoming Training Classes to register.

+1 513.852.5110
+1 800.361.2216

argus.sales@argus.aero