Aviation Human Factors Industry News

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Hello all,

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In this weeks edition of *Aviation Human Factors Industry News* you will read the following stories:

Loss of control study seeks pilot input

“Loss of control in flight is one of the main causes of aviation accidents. This survey is part of a research project which explores the connection between the flight training process and preventing loss of control accidents,” says researcher Catherine Troyer, a graduate student in aviation management working with graduate student Alyssa Harvey and Professor Brian Dillman at the School of Aviation and Transportation Technology at Purdue University.“We expect that the results obtained from this study will be used to advise the FAA of possible changes to the Commercial Airmen Certification Standards and other training resources and improve the safety of general aviation for future generations.”

The survey consists of 12 to 15 questions and should take less than 15 minutes to complete, according to the researchers. Once you begin the survey, you can stop at any point and continue where you left off later.

Researchers at Purdue University are looking for pilots to complete a survey on flight maneuvers.

6 aviation claims trends to watch

Aviation claims include incidents like hard landings, bird strikes, runway incidents and crashes.

Despite the recent Boeing 737 crashes in Indonesia and Ethiopia, the global airline industry has had a solid safety record in recent years, particularly considering there are more than one million people in the air at any one time.

The number of aviation-related insurance claims, however, shows no sign of abating. Human error, rising repair costs from composite materials and higher value engines, an increase in ground incidents at more congested airports, and a growing reliance on automation are just some of the main factors influencing loss activity.

Aviation claims by the numbers

AGCS analyzed more than 470,000 insurance industry claims over the past five years and found aviation collision and crash incidents are the second top cause of insured losses globally overall behind fire and explosion incidents. Aviation claims from this data set show collision/crash incidents account over half the value of all claims (59%) and more than a quarter by number (27%). Such incidents do not just include major crashes; they also incorporate events like hard landings, bird strikes and runway incidents such as incursions and excursions (the average claim for which is now almost $1.6 million).

Here are six trends we identified for the global aviation industry from the claims analysis:

1.Safety milestones and losses continue.

With more reliable engines and technology and following significant improvements in airline risk management, there are far fewer serious accidents. According to the International Air Transport Association (IATA), there was just one major accident for every 8.7 million flights in 2017 — over four billion travelers flew safely on 41.8 million flights.

We have already seen a fatal crash in 2019, and 2018 had a total of 15 fatal airliner accidents, resulting in 556 fatalities. Even with these incidents, 2018 was the third safest year on record by the number of fatal accidents and the ninth safest in terms of fatalities, according to the Aviation Safety Network.

2. Human error is a major loss factor.

Technological advancements and improved quality control of aviation manufacturing and maintenance have significantly reduced the number of accidents caused by mechanical or structural failure. Consequently, human error has become a more significant cause of loss.

Pilot error is a major factor behind many aviation accidents. It has been estimated that as many as 95% of airline accidents involve human error in some capacity. Aircraft are now very safe but most accidents involve errors of judgment, such as taking off in bad weather or the way in which a pilot reacts in adverse conditions.

3. Increasing claims frequency and aircraft values.

While catastrophic air crashes are now far less frequent, the overall frequency of aviation claims is slightly up, due to factors such as higher repair costs, increased values at risk and the relatively low deductibles maintained by airlines in what has become a highly competitive aviation insurance market. The average deductible at $1 million today is around the same as it was in 1982, yet aircraft values have increased three-fold.

Despite few major losses and no fatalities in 2017, the aviation insurance market barely broke even — a reflection of market conditions and attritional losses, while 2018 represented the sixth consecutive year where airlines claims exceeded premiums according to broker JLT.

Claims frequency is up, but this is not the only factor. The size of loss has increased and deductibles have not kept pace with technology and values. A $5 million loss today would probably have cost just $1 million five years ago and been within the deductible.

4. Costly composite materials & engine repairs.

The use of composite materials in aircraft manufacturing really took off around a decade ago, and today the majority of the world's commercial airline fleet now relies on such materials.

Composites — such as carbon fiber layers bonded with resin — are strong, but also light, therefore reducing weight and increasing fuel efficiency. Such materials are now used extensively in modern aircraft — some 50% of Boeing's 787 Dreamliner is made of composite materials by weight.

The claims experience has revealed a higher repair cost associated with composite materials which are generally more expensive to manufacture than traditional metal alloys, more labor intensive to repair and often require a larger repair area. For example, a claim involving a fire under the front landing gear of a 787 cost $13 million to repair. The same incident for an older generation metal alloy aircraft would have cost somewhere between $3-4 million.

While safer and more reliable, aircraft engines are also now much more expensive to repair or replace. Top-of-the-range engines used on the Airbus A350 can easily cost more than $40 million each — just under the value of a whole 737 a decade ago. The drive for fuel efficiency has resulted in lighter engines that fly longer distances. However, technical advances such as the use of new materials and thinner, lighter turbine blades have reduced the tolerances at which engine components operate while the cost of spare parts has also increased.

5. Congested airports bring more ground incidents.

In addition to increased repair costs, insurers are seeing more attritional claims. The rapid growth in air travel — the number of air passengers is expected to double to 7.8 billion by 2036 — has resulted in more congested skies and airports.

In many cases, airport infrastructure has not kept pace with the rapid growth in passenger and aircraft numbers. With more aircraft on the ground, servicing areas and aprons have become more congested and this is resulting in an increase in the number of collisions with other aircraft or ground handlers.

Analysis of 523 loss events at 14 German airports last year by AGCS shows that damage to vehicles on the tarmac is the leading cause of insured losses. More than half of these events are due to collisions with pushback tractors, baggage trolleys, aerial work platforms or washing systems.

For example, the introduction of a new form of tow-truck (that wraps-around an aircraft's front landing gear) has resulted in several large claims. A number of tow-trucks have caught fire while in operation, damaging aircraft — one resulted in the total loss of a Boeing 777.

6. New loss drivers: Cyber and reliance on technology.

Aircraft and airlines are increasingly reliant on technology — from aircraft to ticketing. An A350 aircraft today sends some 400,000 computer messages to ground controllers during a six-hour flight, 60% more than the older A380.

The technology for crew-less commercial passenger aircraft already exists, but the reality is many decades away. However, aircraft are likely to become increasingly automated, driven by the desire to reduce costs and because of the predicted shortage of pilots — Boeing has said over 600,000 pilots will need to enter the industry over the next 20 years. Flights with just one crew member on the flight deck, with ground support, would have implications for crew skills and training, as well as how they deal with adverse conditions.

Then there is the threat to the sector posed by technology or cyber-related losses, such as physical damage to aircraft or business interruption from issues like an IT system outage. Cyber risk ranks as the number one concern for the aviation sector for 2019, according to the eighth annual Allianz Risk Barometer, which surveys industry risk experts. To date, there have not been any major aviation claims triggered by a cyber incident, although insurers have paid out on some indirect cyber claims.

While crewless passenger aircraft are some way off, autonomous flight is an emerging area for aviation insurance claims. And, as drone use broadens into different areas, claims will become more relevant.

NTSB: Chopper that malfunctioned in Destin lacked a washer

A National Transportation Safety Board investigation has determined that the separation of the tail rotor drive shaft on a Robinson helicopter used by Timberview Helicopter for tours lacked a washer when it malfunctioned more than three years ago. In its factual report released Friday on the accident that occurred just before noon Nov. 26, 2015, in Destin, the NTSB reported that "the hardware was in the correct sequence with the exception of the omission of a washer between the flex plate and the clutch shaft yoke."

That caused a loud pop just as the helicopter pilot had begun to power up for liftoff. The flight was canceled and the pilot and three passengers on board were not injured.

Examination of the helicopter found the steel tail rotor drive shaft was fractured all the way around where it meets the forward flange. Also, a portion of the intermediate flex plate remained bolted to the flange while another part of it remained bolted to the clutch shaft yoke. In addition, the tailcone attachment frame and the damper assembly mount angle had fractures.

There was no report of any damage to any frame or to the interior of the tailcone behind the damper. The NTSB Materials Laboratory has kept parts of the flex plate and the clutch shaft yoke for further examination.

The helicopter had accumulated 1,770 of flight time when the accident happened.

NTSB said during its inspection that the helicopter “exhibited features consistent with over-stress.” The agency also questioned in its factual report whether measurements to the intermediate flex plate were correct.

A mechanic who performed repairs on the helicopter said the dimensions were the same during and after the clutch removal and installation. They also matched when he installed new hardware.

Meanwhile, a representative of the manufacturer of the Robinson helicopter told the NTSB that a missing washer could cause fatigue and failure of the tailrotor drive-line. He added that the company had never seen a failure like the one in the Destin accident.

CESSNA WING REPAIRS CATCHES PILOT SHORT ON FUEL

A Goldfields Air Services Cessna 172M had to make a forced landing into scrubland when inspecting fire fronts after running out of fuel because the pilot did not check the aircraft’s operating handbook, the Australian Transport Safety Bureau (ATSB) has found.

The incident occurred about 72km southeast of Kalgoorlie Airport in Western Australia on January 5 2018.

The ATSB final report published on Wednesday said that if the pilot had checked the operating handbook, he would have found an entry explaining that new wings on the aircraft, VH-TUX, had been fitted with tanks that carried less fuel capacity than the previous tanks.

The report's safety message said that it continued to receive reports of fuel starvation and exhaustion, adding that it was important for pilots to educate themselves on the risks and controls associated with fuel management.

It also said methods for cross-checking fuel on board before flights was also published by the Civil Aviation Safety Authority (CASA).

The ATSB final report said the pilot had flown the aircraft numerous times before. However, on the day of the incident the Cessna 172M was on its first revenue paying flight following repairs and its return to service.

Apart from the installation of a new propeller, the report said the pilot noticed the aircraft appeared largely unchanged, failing to detect the reduced fuel capacity.

But the pilot did receive a hint that something was different when, during the daily inspection, he put a dipstick in the right-hand fuel tank and noticed it was graduated in fractions, not decimal increments as had been the case when he had flown the aircraft previously.

The ATSB report said the pilot did not dip the left tank as he intended to fill both tanks before departure and uploaded 45.9 litres of fuel between the two tanks, thinking this was consistent with his previous experiences with the aircraft.

Because the aircraft had just returned to line following evaluation flights after repairs, there were no trip sheets in the aircraft to indicate recent fuel history. As a consequence, the pilot reported a total fuel load of 180 litres based on an expectation that maximum capacity was 182 litres. However, the tanks on the new wings had a capacity of only 144 litres.

Before departure, the fire spotter that was joining the flight had identified a second fire-front that required inspection.

The pilot told the ATSB investigation that they planned their flight using the OzRunways electronic flight bag application and a Jeppesen circular slide rule. The ATSB report said this was "inconsistent with the operator's standard operating procedures and instructions".

Had he looked at the manual he would have seen a hand-written entry dated 22 December 2017 adjacent to the fuel section recording that the wings had been replaced and that fuel capacity was 144 litres. The entry also referenced a supplement for fuel consumption data.

But the ATSB noted that the change to the aircraft's total fuel tank capacity (and corresponding reduction in the aircraft's endurance) was not formally published in the operators' Air Maestro Safety Management System that would have alerted line pilots of the significant modification to the aircraft prior to its return to service.

As a result of thinking there was more fuel in the tanks than there actually was, the aircraft made a forced landing in scrubland 72km from Kalgoorlie Airport, where it was heading after two fire spotting inspections in the Lake Johnstone area – the first 232 kilometers from Kalgoorlie and the second 289km south-west from the first inspection.

Both the pilot and fire spotter on board the aircraft were unharmed by the forced landing. However, the pair had to walk a kilometer to Burra Rock Main Dam to get mobile phone reception as neither the VHF radio or phone worked where they landed.

During the flight, the engine speed began to reduce steadily toward idle, forcing the pilot to switch between fuel tanks and adjust the mixture and throttle settings. This resulted in the engine speed momentarily increasing before returning to idle.

Preparing for a forced landing on a dirt road, the pilot realized the aircraft's glide range would be insufficient and identified an area of less dense scrub and landed the aircraft with minimal damage.

ATSB said the pilot's flying instructor experience instructing student pilots on the procedures for an engine restart and practiced forced landings likely aided in managing workload during the emergency and led to the successful forced landing.

The investigation found the pilot's in-flight fuel management resulted in insufficient endurance to safely conduct the planned flight and the aircraft exhausting its useable fuel supply.

"During the accident fight, the pilot observed a steady decrease in the indications on the fuel gauge, but the pilot discounted the accuracy of the indications," the ATSB final report said.

"The pilot's in-flight fuel management was likely based on the expectation of the aircraft's endurance, rather than crosschecking the expected fuel burn against the fuel burn achieved during flight at the 30-minute intervals required under the operator's standard operating procedures.

"Further, the pilot's pre-flight planning was inconsistent with both the regulatory requirements for flight planning and preparation, and the operator's own electronic flight bag administration and in-flight fuel management procedures."

The full report can be read on the ATSB website.

United Airlines Mechanic Killed In Collision With Snowplow At DIA

A United Airlines mechanic was killed in a crash with a snowplow on Denver International Airport property during the blizzard. James Raff was killed about 9 p.m. recently.

Raff, 65, of Aurora, was driving a Nissan Frontier truck southbound on Queensburg Street when he lost control of his vehicle and crossed into the northbound lanes where he struck a snowplow head-on.

Raff was pronounced dead at the scene. Queensburg Street is an access road at DIA northeast of the north-south runways.

It is unclear whether Raff was traveling to or from work at the time of the crash. The driver of the snowplow was not injured.

The blizzard was ongoing at the time of the crash on Wednesday night with snow and blowing snow caused by strong winds in the area.

Sea-Tac Airport Sees Increase in Ramp Accidents

In 2018 there were 311 ground incidents on the ramps around an increasingly congested Sea-Tac Airport. What it is, and how the airport plans to fight back.

Sea-Tac Airport is working to fight in a major increase in the number of ground incidents and accidents going on below your airport window seat.

Often referred to as "ramp rash," the incidents have ranged from simple scrapes to vehicles coming into contact with walls or movable jet-ways, to baggage tugs and vehicle collisions and even some broken limbs.

The concern is that these incidents could dramatically worsen as they have in the past, with millions in aircraft impact damage and delays along with severe long term injuries and even fatalities.

An airport chart shown to the Port of Seattle Commission on April 16th, showed airfield ground incidents going from 88 in 2014 to 310 in 2018. In 2017, the airport began dividing the incidents into minor and major.

Major incidents involved a trip to the hospital for an airport or airline employee or $1,000 or more in damage. Of the more than 300 total ground incidents, 84 fell into the major category in 2018.

Of those 190 incidents in 2017, 60 of them were major.

The occupational injury rate has crept back up since reaching a low in 2016.

The number of incidents has correlated closely with the dramatic upswing in the number of flights being handled at Sea-Tac Airport, which remains one of the fastest growing in the U.S. It is now the nation's eighth busiest airport.

Sea-Tac officials said they've been a leader in many safety initiatives to prevent visibility related runway incursions, damage from debris on the runways and taxiways, but incidents and the rate of incidents on the ramps has increased.

"Ground incidents are really the hot spots we're trying to address," said Michael Ehl, Director of Aviation Operations.

In a memo to the Port Commission from April 8th, Ehl and other health and safety managers at Sea-Tac requested $2.3 million to create a Port-Wide Behavior Based Safety Awareness and Engagement program, which would include partnerships between the port, airlines and ground service companies. They handle everything from fuel, maintenance, baggage and food handling.

In its presentation, airport executives cite "Behavior-Based Risks" including rushing, lack of proficiency, complacency and noncompliance where employees are not following instructions. The solution they feel is to create a standardized safety culture and instill a positive "want to be safe" attitude so workers feel a stake in returning home to their families and loved ones in one piece.

Part of the plan also includes creating an equipment inspection program to make sure ground equipment, most of which is owned by the airlines and ground service providers, is in good condition. Many, if not most, of the incidents involve some sort of incident or accident involving baggage carts, trucks and buses.

In one case a member of the ground handling team suffered broken legs when pinned between two baggage carts.

Other incidents included boxes blown away by jet blast, falling off lift trucks, a fuel hose run over by a lavatory truck, a de-icing truck hitting an aircraft, a catering truck leaking hydraulic fluid on the ramp that at first went unreported by ground employees.

https://meetings.portseattle.org/portmeetings/attachments/2019/2019_04_16_SM_8c_supp.pdf

https://meetings.portseattle.org/portmeetings/attachments/2019/2019_04_16_SM_8c.pdf

Connecting Planes in Trouble with Ships at Sea

A World War II era bomber pressed into transoceanic service as a freighter is lost. It's night. The water below is frigid. Whether the crew survives depends on how close to a ship they can ditch their aircraft. Now, a new initiative would put ships and planes together, greatly reducing the time in water for aircraft crewmembers.

LISTEN TO THE EPISODE

Maintenance error bends Piper

While conducting touch-and-go landings and as the private pilot landed the Piper PA-28R for the third time, the right main landing gear and nose landing gear collapsed, and the right wing was partially separated from the airplane.

Post-accident examination of the airplane revealed that maintenance personnel had improperly secured an unused instrument lamp socket during recent maintenance, which allowed an electrical short of the landing gear controls.

The landing gear control circuit breaker tripped, which stopped the landing gear from fully extending while it was transitioning to the down position. It also rendered the landing gear indicators and warnings inoperative so the pilot was unaware the landing gear was not fully extended.

Probable cause: Maintenance personnel's improper securing of an unused instrument lamp socket during recent maintenance, which resulted in an electrical short of the landing gear controls and stopped the landing gear while it was transitioning to the down position and led to the landing gear collapse.

NTSB Identification: CEN17LA150

This April 2017 accident report is provided by the National Transportation Safety Board. Published as an educational tool, it is intended to help pilots learn from the misfortunes of others.

A Communication Disconnect

The axiom that communication influences the outcome and success of every human endeavor is rarely more evident than within the complexity of modern aviation. Many types of communication are employed in aviation, and an error or degradation could result in serious consequences. Systems and equipment used include normal conversation, handwritten notes, hand signals, light gun signals, paper copy, radio, interphone, telephone, digital links such as PDC and CPDLC, SATCOM, ATIS, NOTAMs, transponders, microphones, headsets, megaphones, and more.

Communication during aviation operations becomes a special challenge when systems, human factors, or other circumstances adversely affect the transfer of much needed information. Poor communication can cause or aggravate problems. Good communication can alleviate or prevent problems and aid in solutions. Communication errors abound in aviation operations, and ASRS has received many reports of communication incidents implicating most methods and equipment currently employed.

After normal communication with the ground crew was established, this B737 flight crew got a surprise during engine start and pushback. While the incident could have ended much worse, appropriate communication may have aided in minimizing risk and resolving the problem.

From the Captain's Report:

- We began a normal, on time pushback from [the] gate. Wired communications with the ground crew were standard. I directed my First Officer to start engines. He was starting Engine Number 2 when I noticed the Wing Walker give >

me the hand signal for “Set brakes.” I did not set the brakes, as we were still moving backward at a fast walk pace. I queried the Tug Driver over the intercom, and there was no answer. Our rearward speed increased, and the Wing Walker was still signaling, “Set brakes.” It was then that I noticed my tug was at the Safety Zone and not connected to our aircraft.

It took some time for this reality to set in, as the Tug Driver showed no sense of urgency and no attempt to communicate. I thought perhaps this was another tug, not ours. I gently applied brakes and brought the aircraft to a smooth stop. My First Officer and I were confused and a bit shocked at what had just occurred. I signaled my ground crew repeatedly to reconnect so I could ask what happened. They repeatedly refused and walked away. After discussion with my Dispatcher and the Chief Pilot, I decided to return to the gate to investigate what happened and have Maintenance inspect our nose gear.

Maintenance found nothing wrong with the nose gear. The Ground Operations Supervisor told me that the crew had not secured the tow bar correctly, resulting in a disconnect.… This could have been a tragedy.

The error with the tow bar was just the start. The Tug Driver should have communicated via intercom with urgency the moment this happened. He delayed and his headset cord detached from the aircraft. At that point he and the entire ground crew should have recognized this as an emergency. They all should have signaled by hand, “Stop!” Instead, the Tug Driver remained seated and became a spectator. The Wing Walker signaled, “Set brakes.” Had I complied with his signal, the flight attendants most likely would have been injured. There was also a possibility of a tail strike (yes, we were moving that fast). Had we been in proximity of another aircraft or any obstacle, the collision would have occurred before I knew what happened.

The ground crew involved need to be [educated].… Failure to properly secure the tow bar resulted in tow bar separation.… Failure to recognize this as an emergency and act accordingly put our aircraft and passengers in danger.… Refusal to communicate with me afterward was just unprofessional.

From the First Officer's Report:

■ The training of ground and ramp crews needs to stress the importance of communication with the flight crew anytime the aircraft is moving. The need to contact the flight crew by any means necessary when the tow bar becomes detached during pushback should be understood as urgent to prevent an injury, incident, or accident.

NTSB Issues Safety Alert on Stabilized Approaches

The National Transportation Safety Board (NTSB) recently released Aviation Safety Alert 077, "Stabilized Approaches Lead to Safe Landings." The notice emphasizes that "failing to establish and maintain a stabilized approach, or continuing an unstabilized approach, could lead to landing too fast or too far down the runway, potentially resulting in a runway excursion, loss of control, or collision with terrain."

Safety Alert 077 cites several aviation accident reports where failure to maintain a stabilized approach contributed to the outcome. The Alert also provides pilots with helpful tips on how to maintain a stabilized approach, as well as several resources that can provide you with more detailed information.

Go to https://www.ntsb.gov/safety/safety-alerts/Documents/SA-077.pdf to view the Alert.

Aircraft Laser Strikes Down Again in 2018, FAA Reports

Heightened public awareness of the serious safety risk posed by lasers is credited with reducing the total number of laser strikes on aircraft in 2018. This was the second consecutive year that the number declined.

The Federal Aviation Administration credits heightened public awareness of the serious safety risk posed by lasers for reducing the total number of laser strikes on aircraft in 2018. This was the second consecutive year that the number declined, FAA reported.

The numbers:

- 5,663 laser incidents in 2018
- 6,754 incidents in 2017
- 7,398 incidents in 2016

The agency noted that "the substantial number of reported incidents clearly show that laser strikes on aircraft remain a serious threat to aviation safety.

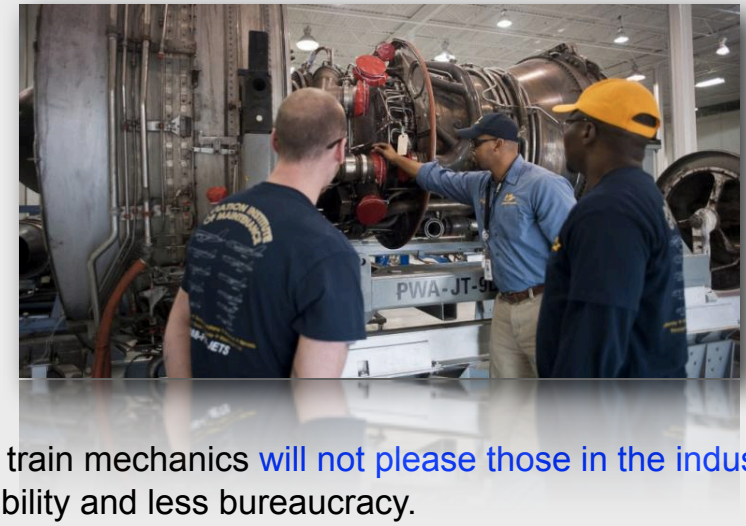
The signing on Feb. 14, 2012, of the FAA Modernization and Reform Act of 2012 made aiming a laser pointer at an aircraft a federal crime. Section 311 of the act amended Title 18 of the United States Code Chapter 2, §39, by adding section 39A, which makes it a federal crime to aim a laser pointer at an aircraft.

https://www.faa.gov/news/updates/?newsId=93445

https://www.faa.gov/about/initiatives/lasers/

Industry: FAA's Proposed Mechanic Training Rules Too Rigid

FAA's proposed update to modernize the Part 147 maintenance school rule sticks with time-based, versus competency-based curriculum.



FAA's proposed expansion of rules that aviation maintenance technician schools (AMTS) must follow to train mechanics will not please those in the industry who were hoping for more flexibility and less bureaucracy.

FAA's supplemental notice of proposed rulemaking (SNPRM), set for publication Apr. 16, seeks to make Part 147, which AMT schools must follow, more modern. Approved in 1970 and modified little since, Part 147 is far behind modern aviation technology, such as composite repair. A 2015 draft rule based largely on a 2009 industry rulemaking advisory group report addressed many of the modernization concerns, such as updating core competencies that students should learn.

But commenters identified two major issues: FAA's insistence on an hours-based curriculum, not a competency-based one, as well as the growing need to teach classes at remote locations, such as high schools, that were not FAA approved. The SNPRM adds both of these, but with caveats: FAA would approve competency-based curriculum on a case-by-case basis, and it also would require approval of so-called satellite locations.

While encouraged by FAA's progress, the Aviation Technical Education Council (ATEC) is concerned that the expanded rule would add more red tape than benefits.

"The agency's insistence that it approve a school's competency-based program is going to create nothing but bureaucratic roadblocks," ATEC Executive Director Crystal Maguire said. "The FAA oversees safety, not education. It needs to leave the education part to [the Department of Education], which these schools are already beholden to as part of being accredited educational institutions."

ATEC also expressed concern about how FAA proposes handling remote instruction, such as programs that partner with local high schools to offer introductory AMTS courses. Exposing potential mechanics to the business is seen as key to ensure industry has enough technicians in the coming years-part of the reason that airlines, repair stations, and AMTSs are partnering with local schools.

FAA's plan for AMTSs is to either certify so-called "satellite" locations as dependent or independent. Both would require registering with FAA, and an independent operation would have to apply for its own Part 147 certificate. "Both types of satellite training locations must use the curriculum and procedures of the parent AMTS," FAA explained in the updated draft rule's preamble. "The independent satellite training locations, however, may implement differences in the curriculum and procedures, provided those differences are documented and accepted or approved by the FAA, as applicable."

ATEC suggested language that permitted remote operations so long as the AMTS "provides suitable facilities, equipment, and material" similar to what the rules require of certificated schools.

"Adding [requirements] to the regulation on satellites that call for more government approval isn't the answer," Maguire said, expressing concern that existing high-school partners may pull back rather than seek FAA's blessing to keep hosting AMTS classes.

The 170 active AMTSs produce about 60% of the 6,500 new aviation mechanics certified in the U.S. each year, with the rest coming from the military or other sources, such as industry-sponsored instruction.

The new draft rule will be open for public comment through June 15.