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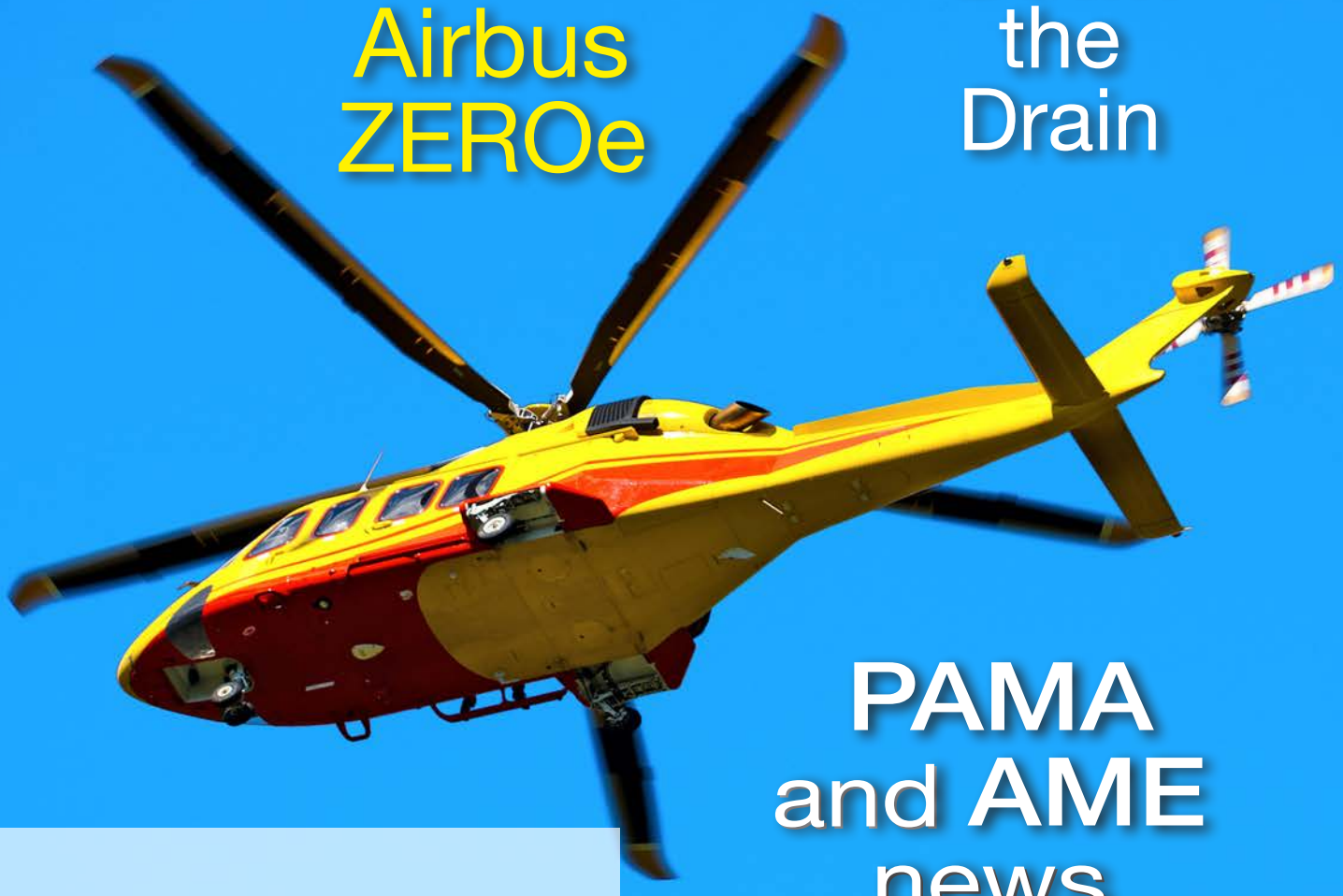

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737 MAX Must Remain Top Concern

Photo Courtesy: Boeing

IN EARLY SEPTEMBER there were reports that the Federal Aviation Administration is investigating potential defects in Boeing's 787 Dreamliner production. However, at least one industry watcher believes that regardless of FAA actions the 737 MAX must remain the subject of Boeing's main focus.

"Despite this new reported investigation, the global recertification of the 737 MAX must remain Boeing's priority," says Harry Boneham, Aerospace and Defense Analyst with the data and analytics firm GlobalData, According to Boeing, the 737 MAX accounts for approximately 80 percent of unfilled orders. In the context of an uneven post-COVID-19 recovery in which demand for narrow-body aircraft is likely to recover more quickly, the need for Boeing to re-certify its primary narrow-body product is glaring."

Boneham goes on to say, "The current crisis has significantly disrupted the entire commercial aerospace industry and a recovery is not anticipated in the short term, with the prospect of a lost decade for air passenger growth increasingly likely. Furthermore, even from Boeing's wide-body offerings, there are alternative offerings that are likely to align more closely to the demands of the post-COVID-19 market."

"The 777X, is being billed as an advancement on the 787, and one of the most efficient products on the market. This aligns with rising demand for carbon-responsibility in the commercial aerospace industry. Regulations such as the International Civil Aviation Organization's CO2 emissions standards encourage airlines to integrate newer, more efficient models into their fleet. This renders the 777X a key product going forward." ■

— John Campbell
Editor

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Upcoming Events

24th annual Bombardier Conference Safety Standdown 2020 going virtual

Bombardier's 24th annual Safety Standdown conference scheduled for October 21st will be completely virtual. The theme for the special event is "Safety in Focus 20/20," and it prompts aviation professionals and organizations to question how to turn their vision of a safer, more efficient organization into reality.

"While we have changed the format this year to ensure attendees remain safe and secure, the goal of Standdown remains – to foster a community of aviation professionals who are committed to lifelong learning and to disseminating higher standards of safety and professionalism throughout the industry," said Andy Nureddin, Vice President, Customer Support, Bombardier Aviation.

The new format brings together some of the most prominent Safety Standdown presenters from the past to discuss the broader, more abstract concepts of safety that may lack the 20/20 focus to permit maintenance technicians, pilots, dispatchers, safety program managers, or accountable executives to design and implement safety improvements.

Originally conceived in 1996 as a human factors safety-training event for the Learjet flight demonstration team, the conference quickly garnered a reputation for excellence beyond Bombardier's customer base. In 1999, in response to growing interest within the industry, Bombardier opened the seminar to all pilots. In 2010, Safety Standdown expanded beyond the seminars into a year-round global human factors program offering online resources. Since 1996, more than 10,000 corporate, commercial and military aviation professionals have attended Safety Standdown seminars worldwide, live and through the webcast, including in Brazil, Canada, China, Mexico, Switzerland and the USA. Admission to Safety Standdown has, throughout the years, remained free to all aviation professionals as safety is a top commitment to the flying public.

NBAA encourages more DEF training

The National Business Aviation Association emphasized the importance of training on the proper handling of diesel exhaust fluid in comments recently submitted on an FAA draft advisory circular. The AC outlines proposed training requirements for personnel who store, handle and dispense fuel on airports. NBAA's comments underlined the risks from misfueling turbine-powered aircraft with DEF-contaminated Jet-A.

Mandated by the U.S. Environmental Protection Agency to lower noxious emissions from ground vehicles, DEF is similar in appearance to aviation additive known as Prist or FSII (fuel system icing inhibitor). When mixed with Jet-A, DEF forms non-soluble crystals that can clog aircraft fuel systems. Since 2017, at least three inflight engine shutdown incidents involving business aircraft have been traced back to inadvertent DEF contamination.

In comments submitted August 14, NBAA supported clarification in FAA Draft Advisory Circular AC 150/5230-4C – Aircraft Fuel Storage, Handling, Training, and Dispensing on Airports on the applicability of the existing training requirements for aircraft fuelers and their supervisors.

NBAA's comments also included a prior recommendation to mandate DEF training for ground personnel working at non-certificated airports.

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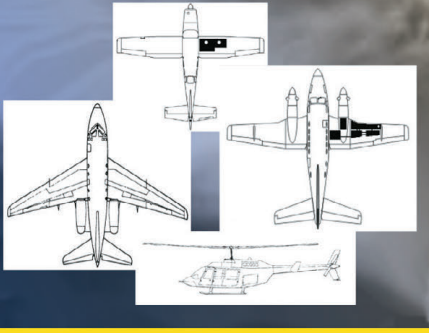

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Concorde Battery has the latest addition to its Platinum series Turbine lineup, the RG-41/53. This 53 Ah AGM battery is TSO-C173a approved and eligible for installation in Piper PA-46-500TP and PA-46-600TP aircraft with FAA STC SA01050DE. The STC approves installation of the RG-41/53 battery in place of Piper Part Number 601-910. It is eligible for use on aircraft registered in the United States and Canada. It is designed as an option to M500 and M600 operators without modification to the airframe. **www.concordebattery.com**

Soundproofing kit approved for Globals

Skandia Incorporated has received final FAA STC approval on its acoustic soundproofing kit for the Bombardier Global line of large cabin business jets. The kit has soundproofing material choices which include skin damping and floor damping, thermal acoustic insulation bags, an over frame blanket and carpet pad. The available Global kit is provided as turnkey with installation schematics and instructions for a straightforward install process.This approval is the company's third business class aircraft soundproofing STC, beginning with kits for the King Air 200 and Pilatus PC-12. **www.skandiainc.com**

New landing light lasts longer

Amglo's Q5559 aircraft landing light is said to have a life up to 200 hours longer than previous lamps. It offers a filament design that exceeds ANSI life requirements and prevents sag and arc-outs. An annealing process prevents lens cracking while the drop-in replacement uses the same fixtures as the Q4559X. It is Boeing IPC-approved. **www.amglo.com**

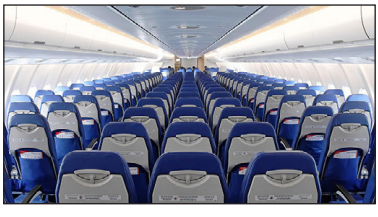
Snap-On pliers prevent backing out

The new P-Series pliers from Snap-on Industrial are manufactured with a staked screw that is compressed to a tolerance at the screw joint to prevent it from backing out during use. This design feature greatly reduces foreign object damage concerns, making it ideal for use in aviation. Manufactured with ball-bearing grade alloyed steel, and hardened to 42-46 Rockwell C HRC, the P-Series pliers are designed to withstand greater impact. The internal torsion spring returns the pliers to the open position, keeping the tool ready for work while minimizing hand fatigue. **www.snapon.com**

Welding helmet has airflow adjustability

Lincoln Electric's new Viking 3350 XG PAPR helmet features a low-profile external button to switch between weld and grind mode, a smart blower system, and an auto-darkening lens. The helmet also features a patented airflow design. The airduct is integrated into the top of the headgear and has two air flow baffles, which the user can adjust to change the direction and distribution of the set air flow. The 3350 XG PAPR comes with a battery that can operate for up to 16 hours. **www.lincolnelectric.com**

APS pairs with HEPA



Donaldson Aerospace & Defense has received product manufacturing approval for its A330/A340 air purification system. Donaldson's APS pairs EASA-recommended HEPA filtration with advanced air purification into a single system. Donaldson's HEPA filtration captures 99.97 percent of harmful contaminants down to 0.3 microns, including pollen, smoke, dust, allergens, bacteria, spores, fungus, and viruses. Air purification takes HEPA's work one step further by removing odours as well. Air purification is achieved through a gas phase adsorption chemical filtration process that removes unpleasant and irritating odours originating inside and outside the aircraft. **www.donaldsonaerospace-defense.com**

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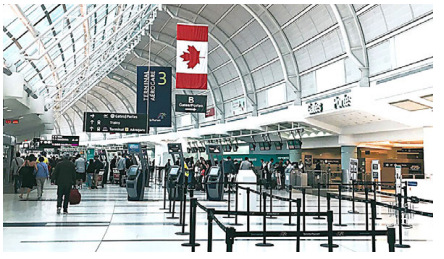
SOME OUTFITS USED LULL TO MAKE IMPROVEMENTS

Washington-based AviationManuals, a provider of digital manual development services and Safety Management System software for business aviation, reported strong demand in the first half of 2020. The firm believes this demand was the result of flight departments taking advantage of reduced schedules due to the COVID-19 pandemic to improve their operations. "We have had surprisingly robust demand in 2020, especially considering the negative effects the pandemic has had on business aviation activity overall," said AviationManuals CEO Mark Baier. "Operators showed a lot of initiative and foresight using the additional time they had available to review and improve the way they operate."

BELL FLEET TURNS LOCUST HUNTER

The Bell 206L-4s in South Africa's BAC Helicopters fleet came into their own when the company was awarded a contract in early 2020 to carry out an emergency desert locust survey and control operation in a very remote part of Kenya. The helicopters were tasked with surveying vast areas throughout the Marsabit and Turkana counties in Northern Kenya, locating and mapping the locust swarms which are threatening food security through the region. The 206L-4s were each equipped with specialized agricultural survey equipment, and operated at temperatures of close to 40C, often in very windy conditions.



NAVCANADA HIKES FEES DURING COVID

As expected, September brought increased ATC service rates by Canadian air navigation service provider NavCanada – a development highlighting long-standing concerns expressed by the National Business Aviation Association and others about the fiscal stability of privatized systems, especially when confronted with larger crises. Citing the steep decrease in air traffic due to the COVID-19 pandemic, and the resulting decrease in collected user fees, NavCanada in May announced September's increase averaging nearly 30 percent to base service rates.The rate hike follows a slew of other cost-slashing measures implemented over the past six months by NavCanada to address unexpected revenue shortfalls.

STANDARDAERO LAUNCHES ENGINE TRADING SOLUTIONS

StandardAero has announced the launch of a new business unit to support aviation operators. The company says its Engine Trading Solutions features multiple affordable options to help extend lifecycles for legacy aircraft. StandardAero is offering OEM-aligned engine trading solutions on platforms both for which the company already performs MRO services and for other major engine platforms. The new ETS offerings include aircraft engine sales, lease, exchange and consignment options as well as OEM engine parts, accessories and used serviceable materials.

FIRST DUAL HUD GLOBAL DELIVERED

Bombardier has now delivered the first Global 7500 aircraft equipped with a dual head-up display, which provides additional safety and redundancy. The HUD on the Global 7500 aircraft features Enhanced and Synthetic vision systems, while the second HUD allows increased contribution from the co-pilot during HUD-assisted operations, easier switching between pilot flying and pilot monitoring as well as valuable redundancy during low-visibility approaches. The Global 7500 aircraft is also equipped with the latest Bombardier Vision flight deck that includes fully automatic fuel transfer and cabin pressurization management, and simplified start-up sequences.

SAF NOW AVAILABLE WITH SELECTED JET DELIVERIES

Textron Aviation is now offering customers the option to choose an initial tank containing sustainable aviation fuel with delivery of new Beechcraft turboprop and Cessna turboprop and jet aircraft. Customers of Textron Aviation's

service centre in Wichita, Kansas also have the option of refueling with SAF, which reportedly can reduce CO2 emissions by up to 80 percent over the fuel's lifecycle, compared to those made from fossil sources. As an industry, general and business aviation is alone in having developed internationally agreed-upon carbon emission reduction standards for both aircraft and operators.

GULFSTREAMS NOW COME HIGH-SPEED CONNECTED

Gulfstream recently announced it has received approval from the Federal Aviation Administration for installation of a high-speed dual internet system on G650 and G650E aircraft. Provided by Viasat, the system is said to give customers access to internet speeds that are some of the fastest in the industry. A streaming video service is also available so customers can stream their favourite high-definition content without compromising connectivity. "With the use of Viasat's Ku/Ka dual band terminal that seamlessly switches between satellites, we can provide customers with fast and consistent coverage across the world," said Derek Zimmerman, president, Gulfstream Customer Support.

NEW H145 TACKLES OFFSHORE WIND OPS

Airbus Helicopters and HTM-Helicopters have signed a contract for the purchase of two additional H145 helicopters, making HTM the first operator to use the new five-bladed H145 in the offshore wind segment. For their missions, which include passenger transport to and from wind farms and hoisting technicians to the wind turbines, the two helicopters will be equipped with a powerful hoist, flotation equipment, and cargo hook. The H145's five-blade bearing-less rotor increases its useful load by 150 kilograms, while a smaller D-value allows the craft to operate in more confined areas. ■

Above: Airbus ZEROe Turbofan Concept

The Future is Now

These new Airbus ZEROe concepts have one thing in common: they put hydrogen at the heart of future aircraft.

By 2035, the world's first zero-emission commercial aircraft could take to the skies. To bring this vision to reality, Airbus is exploring game-changing concept aircraft – known as ZEROe – powered by hydrogen, a disruptive zero-emission technology with the potential to reduce aircraft emissions by up to 50 percent.

At first glance, the three recently unveiled Airbus "concept" aircraft offer little more than a sense of déja vu. One looks remarkably similar to a classic commercial aircraft – except with longer, more flexible wings. Another resembles a turboprop-powered airliner with its arrangement of eight-bladed propellers. And the third is a "blended-wing body," a revolutionary design that has seen some traction among engineers over the last year.

But upon closer inspection, the trio features one critical difference compared to predecessors: hydrogen propulsion.

"As recently as five years ago, hydrogen propulsion wasn't even on our radar as a viable emission-reduction technology pathway," says Glenn Llewellyn, Airbus Vice President, Zero-Emission Aircraft. "But convincing data from other transport

AIRBUS ACHIEVES KEY CAPABILITIES

Following the announcement that Airbus plans to introduce zero-emission commercial aircraft models by 2035, Harry Boneham, Aerospace and Defense Associate Analyst at the data and analytics company GlobalData, offered his view.

This announcement signals that Airbus recognizes the environmental impact of commercial aviation and is realigning to conform to a market in which consumers demand climate responsibility. It has been identified that zero-emission aircraft with a range of up to 1,200nm will reduce airport NOx emissions by 60 percent reduce fuel use and direct CO2 emissions by 40 percent, and account for 80 percent of all departures.

Given that the capabilities of these models exceed this threshold, Airbus has positioned itself in a commanding position for the medium and long-term market.

The three concept designs include a turbofan design, a turboprop design and a blended wing design. Of these models, the turbofan and blended wing designs have a passenger capacity of around 200 and a range of approximately 2000nm, while the turboprop design can hold up to 100 passengers and has a range of approximately 1000nm.

Additionally, that the passenger capacity is comparable to contemporary narrow-body aircraft such as the A320neo and B737 MAX, is also encouraging. This will make for an easier transition from these older models to the zero-emission designs, as it will be a straight swap with little adaptation to fleet size and flight frequency necessary. In order not to lose market share, particularly in the narrow-body segment, Boeing must now develop its own low emission offerings. Ultimately, these developments are positive for the industry, pushing it in a direction which is sustainable and aligns with shifting passenger demand.

industries quickly changed all that. Today, we're excited by the incredible potential hydrogen offers aviation in terms of disruptive emissions reduction."

That is indeed the objective. Airbus recently announced its ambition to develop the world's first zero-emission commercial aircraft by 2035. This means only the most disruptive zero-emission technology to reduce the aviation industry's climate impact will need to be rigorously tested and evaluated. And hydrogen certainly stands out from the pack: according to internal calculations, Airbus estimates hydrogen has the potential to reduce aviation's CO2 emissions by up to 50 percent.

Three concepts for future aircraft

In aircraft, there are two broad types of hydrogen propulsion: hydrogen combustion and hydrogen fuel cells. Airbus' three zero-emission concept aircraft are all hydrogen-hybrid aircraft. This means they are powered by modified gas turbine engines that burn liquid hydrogen as fuel. At the same time, they also use hydrogen fuel cells to create electrical power that complements the gas turbine, resulting in a highly efficient hybrid-electric propulsion system. However, each option has a slightly different approach to integrating the liquid hydrogen storage and distribution system. Airbus engineers have conceptualized integration solutions that take into account the challenges and possibilities of each type of aircraft.

"Hydrogen has a different volumetric energy density than jet fuel, so we have to study other storage options and aircraft architectures than existing ones," explains Jean-Brice Dumont, Airbus Executive Vice President, Engineering. "This means

Top, opposite page: The Airbus ZEROe Turboprop Concept.
Left, opposite page: These turbofan, turboprop, and blended wing configurations are all hydrogen hybrid aircraft.
This page: Airbus ZEROe Blended Wing Body Concept.

the visual appearance of our future zero-emission aircraft will change. These three configurations provide us with some exciting options for further exploration."

If hydrogen technology development progresses at the expected rate, Airbus' highly anticipated zero-emission commercial aircraft is expected to roll off the assembly line for entry-into-service by 2035.

To meet this ambitious 2035 target, Airbus will need to launch the ZEROe aircraft program by 2025. This time frame gives Airbus engineers approximately five years to mature all the required hydrogen technologies. Over the coming months, several hydrogen demonstrator programmes – which will test hydrogen fuel cell and hydrogen combustion technologies respectively – are estimated to be formally launched. A full-scale aircraft prototype is estimated to arrive by the late 2020s.

Airbus has unveiled three zero emission concept aircraft known as ZEROe.

CHOICES

In the aviation sector, engineers have identified three hydrogen technologies that could play a role in fuelling future aircraft:

Hydrogen combustion in modified gas-turbine engines: This technology works in the same way as conventional internal combustion, which generates motive power (thrust) by burning gas, kerosene oil or other fuel. In this case, hydrogen (liquid or gas) simply replaces its fossil-fuel counterpart.

Hydrogen fuel cells: This technology is a device that converts energy stored in molecules into electrical energy. During oxidation, hydrogen atoms react with oxygen atoms to form water, a process during which electrons are released and flow through an external circuit as an electric current to potentially power an electric or hybrid-electric propulsion system.

Synthetic fuels: This net-zero carbon fuel is created when hydrogen produced via renewable electricity is combined with carbon dioxide. This fuel can already be added to fossil fuels and used in conventional jet engines. ■

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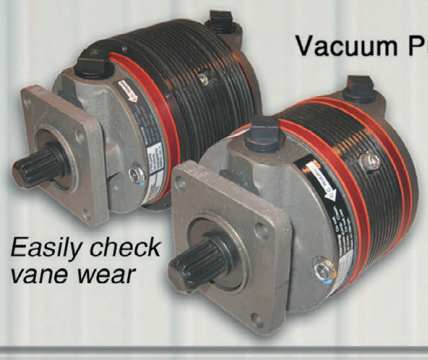

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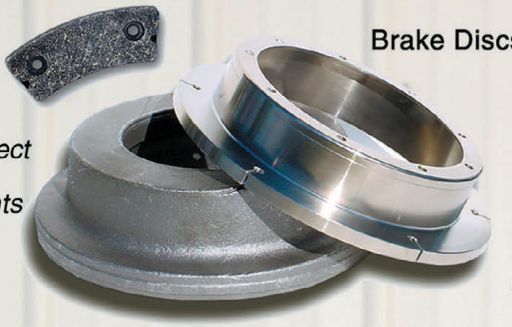

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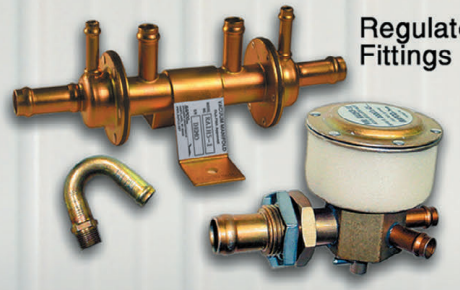

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Down the Drain

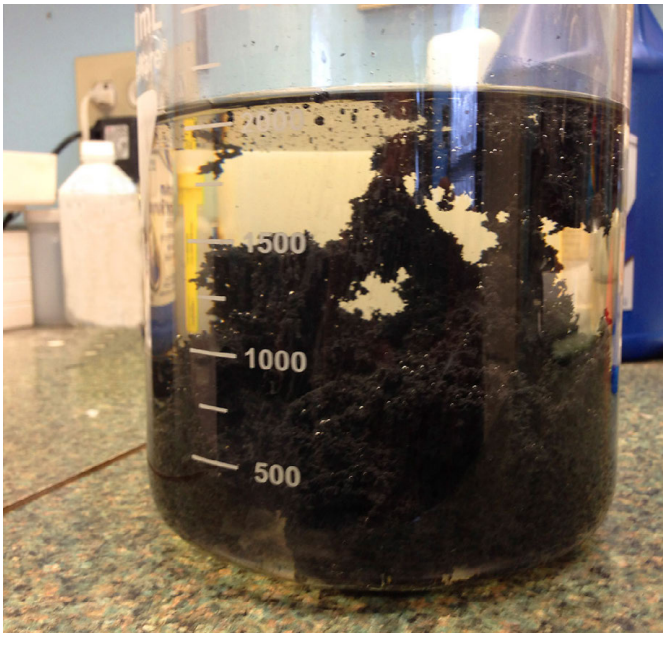
An automated wastewater treatment system might help your shop remain in compliance with EPA and local standards, while saving time, money, and hassle.

A C-130J Super Hercules is cleaned in the wash system.

IN THE MANUFACTURE, maintenance, and cleaning of aircraft, the aerospace industry must meet EPA and local wastewater requirements for effluent, including those under the Clean Water Act where the Environmental Protection Agency in the United States has identified 65 pollutants and classes of pollutants as "toxic pollutants," of which 126 specific substances have been designated "priority" toxic pollutants. Failing to do so can result in severe fines that quickly escalate.

Typically, manufacturing military or commercial aircraft, jet engines, helicopters, or specialized parts can involve using process rinse water. This can be utilized while producing, deburring, or finishing aluminum, titanium, or composite parts. Water is also used for plating metals, molding composites, and manufacturing electronics. For example, in defence, to improve wear and tolerance, aerospace components can use cyanide cadmium plating, a process that produces a toxic waste that must be treated.

In addition, in the maintenance and cleaning of aircraft, washing may be utilized to rid everything from components to fleets of any dirt, debris, or residues that could degrade performance or aesthetics. In the commercial airline sector, even running onboard amenities such as toilets and sinks can produce wastewater.



Above: An automated wastewater treatment system can eliminate the need to monitor equipment in person.

Left: Wastewater seperation.

Below: Sabo Automated Wastewater Treatment.

For the aerospace industry, this means installing a wastewater treatment system that effectively separates the contaminants from the water so it can be legally discharged into sewer systems or even re-used.

Cessna 206 getting scrubbed down.

However, traditional wastewater treatment systems can be complex, often requiring multiple steps, a variety of chemicals and a considerable amount of labour. Even when the process is supposedly automated, too often technicians must still monitor the equipment in person. This usually requires oversight of mixing and separation, adding of chemicals, and other tasks required to keep the process moving. Even then, the water produced can still fall below mandated requirements.

Although paying to have aerospace industry wastewater hauled away is also an option, it is extraordinarily expensive. In contrast, it is much more cost effective to treat the industrial wastewater at its source, so treated effluent can go into a sewer and treated sludge passes a TCLP (Toxicity Characteristics Leaching Procedure) test and can be disposed of as non-hazardous waste in a local landfill.

Fortunately, complying with EPA and local wastewater regulation has become much easier with more fully automated, wastewater treatment systems. Such systems not only reliably meet regulatory wastewater requirements, but also significantly reduce the cost of treatment, labor and disposal when the proper Cleartreat separating agents are also used.

Automated Wastewater Treatment

In contrast to labour-intensive multiple step processes, automated wastewater treatment can help to streamline production, usually with a one-step process, while lowering costs at aerospace facilities.

An automated wastewater treatment system can eliminate the need to monitor equipment in person while complying with EPA and locally mandated requirements. Such automated systems separate suspended solids, emulsified oil and heavy metals, and encapsulate the contaminants, producing an easily de-waterable sludge in minutes, according to aerospace industry consultants at Sabo Industrial Corp., a New York-based manufacturer, distributor and integrator of industrial waste treatment equipment and solutions, including batch and fully automated systems, Cleartreat separating agents, bag filters, and accessories.

The water is typically then separated using a de-watering table or bag filters before it is discharged into sewer systems or further filtered for re-use as process water. Some other options for de-watering include using a filter press or rotary drum vacuum. The resulting solids are non-leachable and are

Sabo wastewater treatment equipment.

The aerospace industry must meet EPA and local wastewater requirements for effluent, including those under the Clean Water Act.

considered non-hazardous, so will pass all required testing. These systems are available as manual batch processors, semi-automatic, automatic and can be designed as a closed loop system for water reuse or provide a legally dischargeable effluent suitable for the sewer system. A new, fully customized system is not always required. In many cases, it can be faster and more cost effective to add to or modify a facility's current wastewater treatment systems when this is feasible.

However, because every wastewater stream is unique to its industry and application, each wastewater treatment solution must be suited to or specifically tailored to the application. The first step in evaluating the potential cost savings and

Gulfstream 450 window washing.

effectiveness of a new system is to sample the wastewater to determine its chemical make-up followed by a full review of local water authority requirements.

The volume of wastewater that will be treated is also analyzed, to determine if a batch unit or flow-through system is required. Other considerations include the size restrictions so the system fits within the facility's available footprint.

Even small aircraft can soak up a lot of water as a normal part of their daily maintenance.

Above: In the commercial airline sector, even running onboard amenities such as toilets and sinks can produce wastewater.

Left: Cleaning and waxing the the Gulfstream 450.

Separating Agents

Despite all the advances in automating wastewater treatment equipment any such system requires effective separating agents which agglomerate with the solids in the wastewater so the solids can be safely and effectively separated out.

Because of the importance of separating agents for wastewater treatment, Sabo Industrial uses a special type of bentonite clay in a line of wastewater treatment chemicals called ClearTreat. This line of wastewater treatment chemicals is formulated to break oil and water emulsion, provide heavy metals removal, and promote flocculation, agglomeration and suspended solids removal.

Bentonite has a large specific surface area with a net negative charge that makes it a particularly effective adsorbent and ion exchange for wastewater treatment applications to remove heavy metals, organic pollutants, nutrients, etc. As such, bentonite is essential to effectively encapsulate the materials. This can usually be achieved in one-step treatment, which lowers process and disposal costs.

In contrast, polymer-based products do not encapsulate the toxins, so systems that use that type of separating agent are more prone to having waste products leach back out over time or upon further agitation.

Today's automated systems along with the most effective Cleartreat separating agents can provide aerospace industry facilities with an easy, cost-effective alternative so they remain compliant with local ordinances and the EPA. Although there is a cost to these systems, they do not require much attention and can be more economical than paying fines or hauling. ■

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PACIFIC

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- Regular news and reports from YOUR Association
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- Access to special discounted group home/auto/aviation/general insurance rates from Gentech/Sound Insurance Brokers (available to PAMEA members only) **(www.soundinsurance.ca)**
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- Share your knowledge ("give back to the industry")
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- Your membership dues enable us to provide bursaries/awards to member BC community colleges' AME Programs (every year)
- Work Authority: 15 percent discount on anything in their stores (across Canada)
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- Perkopolis-Canada's Discount Program: Discounts on many useful services/products **(www.perkopolis.com)**
- Perkopolis Hotels: Discounts on hotels worldwide (similar to trivago, but with TICO coverage)

www.pamea.ca

WESTERN

Western AME Association

2020 AMEC/TEAC National Virtual Aircraft Maintenance Conference

The primary purpose of this virtual event is to bring together aviation professionals and vendors from across Canada (& beyond) and to enable AMEs to access Recurrent Training.This virtual event will feature 18 live learning presentations on October 22, 2020 (from 08:00, Eastern Savings Time until 18:00).

Access for all registered attendees to a variety of presentations covering all aspects of aviation maintenance (Avionics, structures, M1 aircraft, M2 a/c, Fixed Wing, Rotary Wing, MRO, AMO, new technologies, tooling, etc).

Access to 54 x 30-minute training sessions on a video archive site that all registered conference attendees can access for six months after the live event.

Access to schedule a visit with Exhibiting Company Reps to (re) connect. Link to Conference website: **www.ineventors.com/2020amec**

For more information or to register as an attendee, presenter, exhibitor, or sponsor, please visit **www.ame-ont.com** or email **Cara@precisonaerocomponents.com**

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CENTRAL

Central AME Association

The Central Aircraft Maintenance Engineer Association is an organization dedicated to maintaining and enhancing the standards, rights and privileges of all AME members in the central region of Canada.

Our chapter is one of six similar associations across Canada who collectively support the national body CFAMEA (Canadian Federation of Aircraft Maintenance Engineers Association).

Our organization works with Transport Canada in the formulation of new rules and regulations and provides a collective viewpoint for all AMEs.

CAMEA is a not-for-profit organization run by a volunteer group of AME's. We elect members of our organization to be part of our Board of Directors. Members of CAMEA are comprised of AME's, AME apprentices, students, non-licensed persons working in the industry and corporate members.

www.camea.ca

AME Association of Ontario

c/o Skyservice F.B.O. Inc., PO Box 160, Mississauga, Ontario L5P 1B1
tel: 1-905-673-5681 fax: 1-905-673-5681
email: association@ame-ont.com website: www.ame-ont.com

Struggling on with the new normal

Our Board of Directors continues to meet monthly using video chat. Moving to this new format has resulted in many advantages. Although we miss the camaraderie of our in-person meetings, we are spared the burden of battling traffic, which at times saw us stuck in our cars for longer than the time scheduled for the meeting itself. Directors and resource persons are now available to attend from across the province and those on shift manage to get away from the job to be able to join us.

We are developing new skills to provide our members with training that may be useful for individuals as well as for the maintenance organizations that they may work for. A "virtual training conference," individual training sessions and our AME Association of Ontario Annual General Meeting are all being worked on. Even when our world returns to normal we will be able to use our newfound skills and the related programs and processes to bring our association meetings and conference sessions to our members wherever they may be located.

The AME Association of Ontario executive and Board of Directors are optimistic for the future of aviation here in Ontario as well as across the country and around the world.

Submitted by Stephen Farnworth
For the Board of Directors
www.ame-ont.com

Atlantic AME Association

A message from the President

With this year's ARAMC Conference, which was scheduled to take place in St. John's, Newfoundland cancelled, and with no opportunity for re-scheduling; we have missed the face to face contact with you. We look forward to seeing you in 2021 in Halifax.

Many of the annual membership renewals are done during our conference and this year we are missing that opportunity. We are asking you to renew your membership online, on our website at **www.atlanticame.com**. There you can also find our newsletters and other information that may be of interest to you.

The Atlantic Region has the highest percentage of AME members of any of the AME Associations across Canada and your membership is important to us. Your voice as a member of your association is of great value to us and to your fellow Professionals in this great industry. Please join us in continuing to have your input heard and expressed to the regulatory bodies and the industry as a whole. The old adage "strength in numbers" still holds true to this day.

Included in your membership, is membership in (AMEC/TEAC), five free magazine subscriptions and a 10 percent discount card to use at any Mark's Work Warehouse in Canada, a more than $170 value.

Training courses are presented as demand dictates and you will enjoy reduced fees for these events. The AME Association (Atlantic), in partnership with AMEC/TEAC, aims to be your voice and support to our Industry.

I hope we hear from you soon and should you have any questions or concerns, please feel free to contact me or any of our directors as listed on our website. Stay Safe, Stay Healthy, Stay Strong.
Bob Pardy, President

www.atlanticame.com

CENTRAL OHIO

Central Ohio PAMA

About Us

COPAMA was an affiliated chapter of the Professional Aviation Maintenance Association (PAMA) a national association of aviation maintenance technicians. Membership in COPAMA requirements are simple. You must have an interest in aviation maintenance. Our membership includes Aviation Maintenance Technicians (AMTs) from the airline, corporate and general aviation communities as well as pilots, vendors, students and companies, all with the goal of aviation safety.

COPAMA Offers

A forum on Facebook Groups for discussing current aviation events.
An opportunity for AMTs to network, gather and talk with other professionals.
An opportunity for students to shadow technicians on the job, take tours and discuss the aviation maintenance profession.
Scholarships for students of the Aviation Maintenance Technology Programs.
Social gathering opportunities such as the Central Ohio Aviation Golf Outing (COAGO) and the Ohio Aviation Maintenance Symposium, an IA Renewal Training event.

COPAMA is a 501(C)(3) Non-Profit Organization. TIN# 43-2013111.

www.copama.org

PAMA SOCAL

PAMA SoCal Chapter

Featured Podcast: Flight Safety Detectives

World-renowned aviation-industry consultants and former NTSB investigators John Goglia and Greg Feith have 100 years of worldwide aviation safety experience between them. In this hard-hitting podcast series they talk about everything aviation — from the behind-the-scenes facts on deadly air crashes to topics of interest such as tips and tricks for navigating through airports and security, traveling with infants and children, unruly passengers, and packing your bags to ease through security.

Who We Are

The purpose of SoCal PAMA is to promote a high degree of professionalism among aviation maintenance personnel; to foster and improve methods, skills, learning, and achievement in the field of Aviation Maintenance; to conduct local meetings and seminars; to publish, distribute, and disseminate news, technical bulletins, journals, and other appropriate publications dealing with the trade of Aviation Maintenance; to collaborate with other organizations in aviation in the queries of governmental agencies pertaining to maintenance guidelines.
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TC Feedback

The following are selections of Canadian Aviation Service Difficulty Reports originally published as "Feedback" by Transport Canada.

ATR42 320-Incorrectly installed collar which shows evidence of contact with link unit.

REPORTS AND COMMENTS

Report: ATR 42 320
Overhaul oversight leads to damaged landing gear component.

Subject:

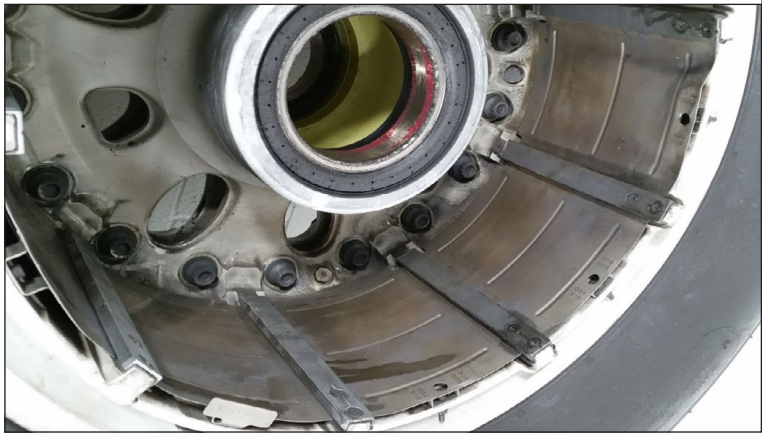
While completing a nightly walk-around, it was discovered that the right-hand main landing gear side brace D22710000-9 was assembled incorrectly at overhaul or last shop visit. The lower arm upper pin Part Number (P/N) D57407 and collar (washer) P/N D57408 at the universal joint, were installed upside down causing the collar to hit the link assembly, P/N GA62048, of the secondary alignment brace. This caused the link to be bent slightly.

Transport Canada Comments:

Maintenance personnel are reminded that when installing components or assemblies onto an aircraft, they are responsible for inspecting that unit and the associated paperwork before installation.

Pursuant to section 571.13 of the CARs, a part is to be inspected and its accompanying documentation verified prior to installation in accordance with a procedure that the Minister finds acceptable, having regard for the safety of the aircraft, to ensure that the part conforms to its type design…

Just because a component has a green tag does not necessarily mean it is serviceable.



Boeing 737-Brake disc retainer showing the wheel assembly wear.

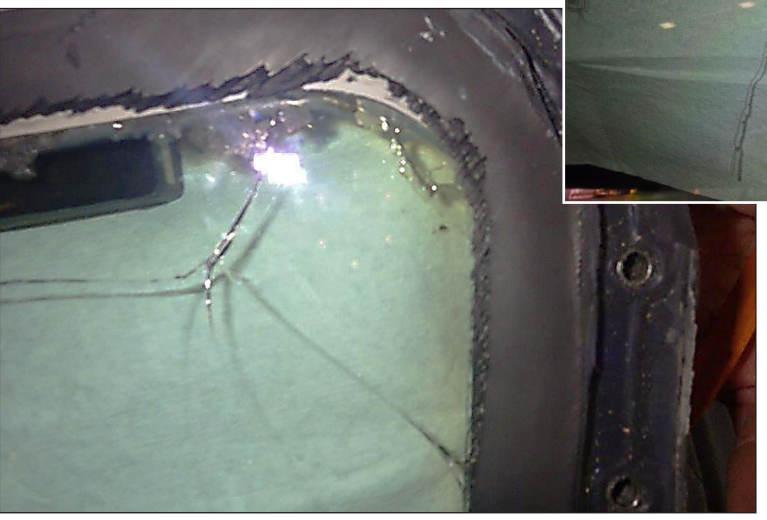
Report: Boeing 737 8Q8
Loose metal found in brake assembly

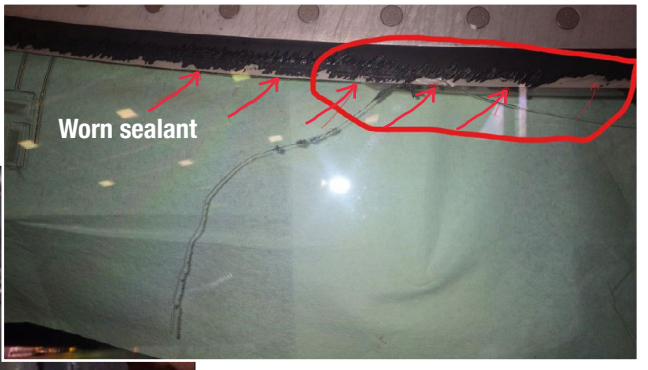
Subject:

During a gear inspection, the maintenance staff noticed the appearance of loose metal inside the aperture of the rim. After removal of the wheel and brake assembly, the brake disc retainer was found loose and metal was also seen coming from the brake disks assembly. The metal brake disc retainer had started to wear a groove in the interior of the wheel rim and a piece of metal was removed from the brake disc assembly.

Transport Canada Comments:

It was not reported what caused these defects, but both issues were discovered when maintenance personnel found something that did not look right and investigated. If the defect had not been found, more extensive and costly repairs may have been needed and aircraft braking capability would have been adversely affected.





Above: Bombardier-Cracking near terminal block and sealant eroded.

Top, right: Bombardier-Window crack and red circle showing the foggy area of water ingress. Arrows show the worn away sealant that allowed the water to get in.

Report: Bombardier CL600 2D15
Windshield heater arcing at terminal block and subsequent window cracking

Subject:

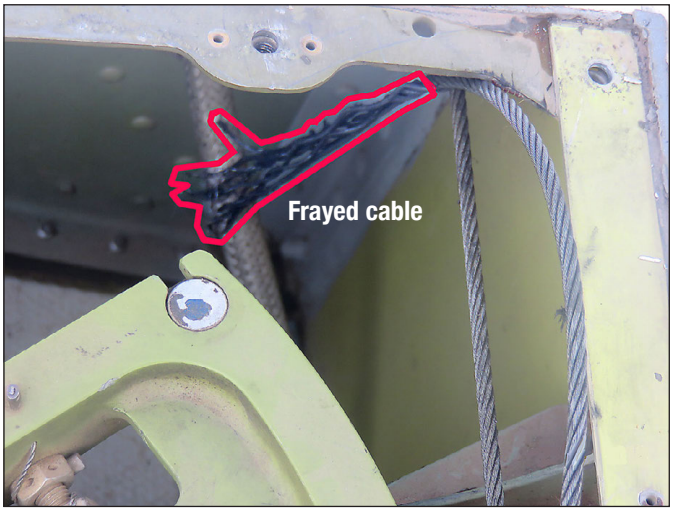
While enroute, the left windshield heater terminal block was reported smoking and arcing causing damage to the windshield. The crew turned the windshield heat off and advised maintenance and dispatch. The flight continued and landed without any further issue.

Maintenance discovered that the arcing had caused the windshield to crack and windshield replacement was carried out. Systems function and aircraft pressure checks carried out and aircraft returned to service.

Transport Canada Comments:

In many cases, cracking windshield events are caused by arcing of the heater elements or arcing at the terminal blocks. It has been found that water ingress has been the root cause of many of these occurrences. As noted in the attached pictures, the foggy area near the terminal block denotes water ingress. The window sealant erosion is also evident and is likely that it did not keep the water out.

Maintaining the integrity of the window sealing should prolong the life of these cockpit windows by preventing ingress of moisture.



De Havilland-Cable broken at the bellcrank.

Report: De Havilland DHC-8-400
Broken aileron cable

Subject:

During the pre-flight check walk around inspection, the right hand outboard aileron was found drooping as compared to the left hand outboard aileron. While performing an inspection on the control cable, they found that one of the cables sections was broken.

The last detailed visual inspection task card 27-900-705-A01 and tension check task card 27-900-706-A01 accomplished was completed 47 flight hours previous to the event. The above tasks are scheduled to be completed at a 2500 hour interval from when the cable was installed. The cable is part number 82742412-001. The cable was replaced and the aircraft returned to service.

Transport Canada Comments:

A reminder when inspecting cables, ensure the entire section of the cable including areas that are hard to see are inspected properly. Keep in mind that the control cable has to last safely until the area is inspected again and in this case there was an expectation for this cable to last 2,500 hours before re-inspection.

Dornier-Scorching and heat residue on the inside surface of the Ballast cover.

Report: Dornier 328 100
Ballast fire creates exciting flight

Subject:

An indication of a cargo fire was reported and a tactile search was performed. The captain advised that they would go through their checklist and may have to declare an emergency. The pilot was then informed of the fire extinguisher going off, he declared an emergency and asked if there was smoke in the cabin, to which the flight attendant confirmed that there was no smoke or fire.

The pilot advised that he would conduct a normal landing and wait for fire crews. Maintenance found the ballast smelt, and when it was removed, it showed internal signs of a short and had an intense smell of electrical burn.

Transport Canada Comments:

The quick reaction and persistent approach the flight attendant took in this case prevented what could have been a very different outcome. It can sometimes be difficult to pinpoint the source of electrical fires/smoke like in this case. Often, electrical components are buried behind sidewalls or under floor. During routine maintenance, a thorough inspection of these components could prevent inflight emergencies.

Report: Douglas DC3C
Attentive walk around prevents possible incident

Subject:

During two separate incidents, an operator of the DC3C with the Basler turbo prop conversion has found cracked outboard elevator attachment hinge fittings. The first incident occurred during a pilot pre-flight walk around. The pilot was checking for free play at the left-hand elevator and noted a clunking sound while shaking the elevator. Further investigation found that the left-hand outboard elevator attachment hinge horn was broken at the bolt attachment.

The second incident occurred during a 150-hour inspection. A close visual inspection of the elevator attachment

Douglas-Hinge with missing piece.

Douglas-Ground view of outboard Elevator Hinge.

Douglas-Close up, borescope view of hinge end with crack.

hinge fitting, located on the right-hand outboard stabilizer location, showed signs of cracked paint. The AME further examined the area closely with a borescope and detected a crack. The crack was not visually detectable without the aid of magnification, such as a borescope, due to the limited access while the elevator is installed.

In both cases, the elevator attachment hinge was replaced with a serviceable part and the aircraft returned to service.

Transport Canada Comments:

Had it not been for an attentive pilot performing the usual pre-flight walk around or an eager AME performing the same old 150-hour inspection, these snag may have gone unnoticed. Remember the dirty dozen and avoid complacency.

"Today is the day I will find something!" ■

Hands Where They Don't Belong

Above: Occurrence aircraft's left wingtip, with crush damage.

Right: Occurrence aircraft on Eabamet Lake during recovery.

Inadvertent moves result in power loss of both engines on the initial climb.

ON **21 JUNE 2019,** at approximately 0140 Eastern Daylight Time, a North Star Air Ltd. Douglas DC-3C Basler Turbo Conversions TP67 aircraft (registration C-FKGL, serial number 19066) was conducting a flight from Fort Hope Airport (CYFH), Ontario, to Pickle Lake Airport (CYPL), Ontario,

with 2 flight crew members on board. The purpose of the flights was to deliver 5940 L of diesel fuel per trip to the Eabametoong First Nation community, also known as Fort Hope. The aircraft was equipped with one 6815 L flexible bladder secured to the floor.

Shortly after takeoff, both engines (Pratt & Whitney Canada PT6A-67R) lost power simultaneously. The flight crew executed a forced landing on Eabamet Lake, Ontario.

After landing, the crew evacuated the aircraft via the main cabin door and swam to shore. The Nishnawbe Aski Police Service responded and took the crew to a nursing station for treatment. Neither flight crew member was injured. The aircraft sustained substantial damage, but there was no post-impact fire. No emergency locator transmitter signal was received by the Joint Rescue Coordination Centre in Trenton, Ontario, at the time of the accident, but one was received approximately 4 hours after the accident. The accident occurred during hours of darkness.

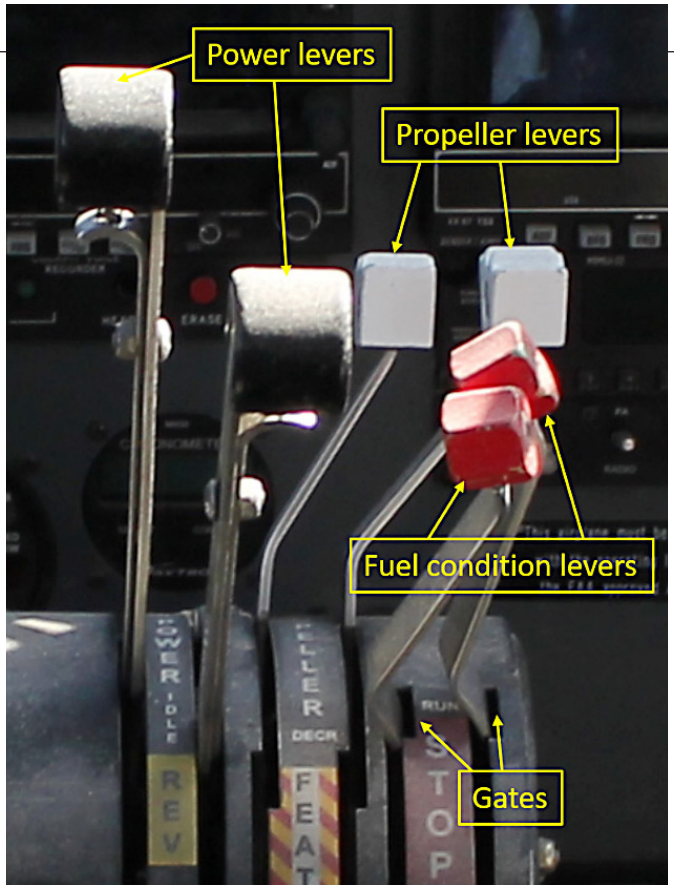
The flight crew arrived for duty at 1830 on 20 June 2019 at the North Star Air base in CYPL and fuelled the aircraft. Between 1914 on 20 June and 0110 on 21 June, the aircraft conducted 3 flights from CYPL to CYFH and return, transporting 5940 L of cargo fuel on each flight. The offloading of the diesel fuel took about 20 minutes and required the flight crew to set up a pump and secure hose connections.

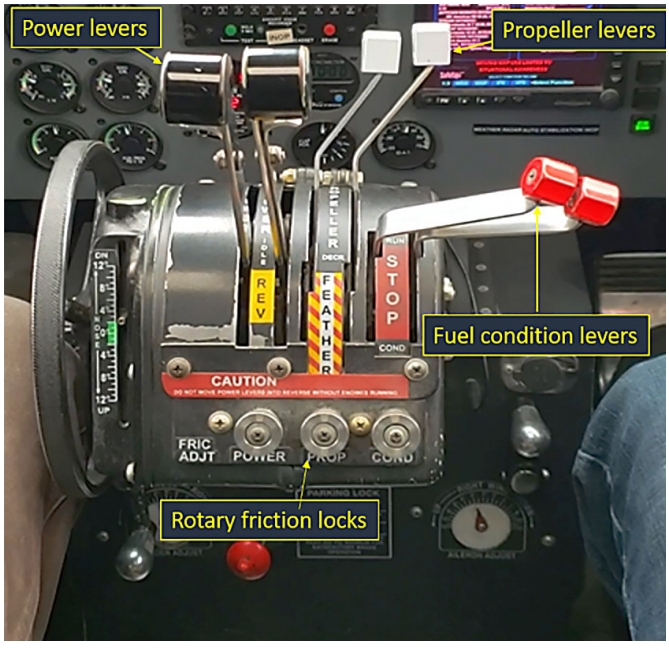
Before departing CYFH on the occurrence flight, the crew conducted the before-takeoff checklist, which requires the propeller automatic feathering system to be armed for takeoff; however, the crew did not arm this system.

At approximately 0140, the aircraft departed CYFH with the first officer acting as the pilot flying (PF), seated in the right seat, and the captain acting as the pilot not flying (PNF), seated in the left seat. Shortly after takeoff, the PF called for the landing gear to be retracted. The PNF then selected the gear up at

Map showing the location of the occurrence.

Main landing gear control handle and mechanical safety latch control handle





Left: Throttle quadrant with the levers and gates labelled.

Top: Picture of the throttle quadrant showing the power levers, propeller levers, fuel condition levers and rotary friction locks.

approximately 200 feet above ground level (AGL). Both engines subsequently lost power simultaneously, and the flight crew executed a forced landing on Eabamet Lake, Ontario, in total darkness.

The aircraft fuselage remained intact and immediately began to fill with water. The flight crew retrieved the survival kit, evacuated the aircraft via the main cabin door, and swam to shore.

Once on shore, the flight crew started a fire to warm up. The fire was noticed by a patrolling officer of the Nishnawbe Aski Police Service, who responded and transported the flight crew to the nursing station at the Eabametoong First Nation Band Office for a medical assessment. Neither flight crew member was injured.

The aircraft sustained substantial damage, but there was no post-impact fire. The aircraft remained floating in the water.

No emergency locator transmitter (ELT) signal was received by the Joint Rescue Coordination Centre in Trenton, Ontario, at the time of the accident. However, the ELT did activate approximately 4 hours after the accident. The investigation did not determine why the ELT activation was delayed.

The captain had joined North Star Air as a captain in April 2017 and had completed his initial training on 03 July 2017. He held a valid Category 1 medical certificate with no restrictions. His last DC3-TP67 pilot proficiency check was successfully completed on 01 March 2019.

The first officer had joined North Star Air as a first officer in May 2018 and had completed his initial training on 25 June 2018. He held a valid Category 1 medical certificate with no restrictions. His last DC3-TP67 pilot proficiency check was successfully completed on 01 June 2019.

North Star Air had completed a 150-hour maintenance inspection on 11 June 2019 and a daily inspection on 20 June 2019. There were no reported defects before the occurrence flight. The aircraft had a basic empty weight of 16 429.7 pounds, and the recorded takeoff weight for the occurrence flight was 18 416 pounds. The flexible fuel bladder was empty on the occurrence flight. The investigation determined that the weight and centre of gravity were within the prescribed limits.

Throttle quadrant

The throttle quadrant consists of power levers, propeller levers, fuel condition levers, and rotary friction locks. There is one set of levers for each engine and associated propeller. Both pilots have functional reach to all sets of levers. The design uses varied colours, sizes, and shapes to facilitate visual and tactile identification. A colour and shape coding and grouping for these levers is common throughout the industry.

The fuel condition levers in this aircraft are offset to the right of the quadrant and angled toward the right seat. The offset is to ensure that these levers do not interfere with the propeller levers. The fuel condition levers stop fuel flow to the engines when they are moved into the down position (STOP).

To allow fuel feed to the engines, the fuel condition levers are placed in the up position (RUN) and are secured in that position by means of a gate. The design of the fuel condition levers requires the flight crew to make a dual-axis motion; to bring down each fuel condition lever from the gate, a pilot needs to shift the lever slightly to the left and then down. With this design, it is possible to move both fuel condition levers at the same time with one hand.

On the occurrence aircraft, the fuel flow to the engines is cut when the levers are moved down past the "O" of the word "STOP" (this position can vary from one aircraft to another).

Rotary friction locks are located below each lever and allow the flight crew to apply resistance to the levers.

Ergonomics

The design of the controls, the displays, and their layout aims to balance functionality, effectiveness, usability, and safety. The layout of the controls in the cockpit takes into account the importance, frequency and sequence of use, or grouping by function. There are options to protect against an unintentional movement of a control, when a pilot accidentally bumps and moves a control or actuates the wrong control. There are

trade-offs between measures to prevent unintentional movement and usability, because such measures may make controls more difficult to operate. Cockpit discipline and procedures also reduce the risk of unintentional movement.

Transportation Safety Board of Canada (TSB) investigators conducted a trial of unintentional movement of the fuel condition levers while reaching for the mechanical safety latch control handle and the landing gear control handle, located on the cockpit floor between the pilot seats in a DC3-TP67 representative of the occurrence aircraft.

This trial was performed during the day while the aircraft was on the ground, with the engines turned off, in a static environment. While the aircraft is on the ground, it is impossible to lift the landing gear handles. During the initial phase of a climb at night, lighting is limited in the cockpit, the aircraft attitude is pitched nose-up, and the crew is in a dynamic environment. The main observations from the TSB's limited trial were as follows:

When a pilot is seated in the right seat, if the pilot's extended left arm moved aft past the throttle quadrant and contacted the fuel condition levers in a continuous movement, it was difficult to simultaneously move both fuel condition levers out of their gates and down. Contact with the levers is physically noticeable.

When a pilot is in the left seat, unintentional movement of the fuel condition levers was more likely with the hands rather than the arms.

Other observations noted: the accidental movement of the fuel condition levers was much easier if both levers were not secured in their individual gates.

When the rotary friction locks were adjusted to a low level, the resistance of the fuel condition levers was still significant enough to help prevent an accidental movement.

When the pilot in the left seat wears long sleeves, particularly with cuffs on a flight suit the possibility of snagging the fuel condition levers was higher, although accidental movement of only the right fuel condition lever was more likely.

Relighting engines in flight

An engine that has flamed out in flight due to a momentary disruption of airflow or fuel to the engine should be automatically relighted if the ignition system switches are in the CONT position.

North Star Air's SOPs also provide flight crews with 2 different emergency procedures for relighting engines in flight: a propeller windmilling procedure and a starter assist procedure.These procedures are based on the AFMS.

The procedure for relighting with the propeller windmilling procedure requires an aircraft speed greater than 160 knots indicated airspeed (KIAS). This allows the engine to obtain sufficient Ng speed (minimum 10%), but, to do so, the aircraft may need to descend. This procedure is completed without starter assist.

To minimize engine damage during the windmilling restart, the SOPs require that the power lever position must be in the IDLE position before moving the fuel condition levers to the RUN position. If this procedure is not followed, the engine response could be rapid, leading to engine surge, compressor stall, engine over-temperature, and Ng over-speed or over-torque. The starter-assist procedure has no airspeed limitation but does require a minimum of 10% Ng before the fuel condition lever is moved to the RUN position. If the Ng is below that recommended, the engine may not relight; therefore, starter-assisted relights should be performed when possible to allow for a stabilized Ng.

Propeller automatic feathering system

The primary role of the propeller automatic feathering system is to quickly reduce the drag associated with a failed engine, with no action required by the flight crew.

The DC3-TP67 is certified under Title 14 of the Code of Federal Regulations (CFR), Part 25: Airworthiness Standards: Transport Category Airplanes, which requires that 2-engine aircraft maintain a climb gradient of 1.2% at the maximum certified take-off weight following an engine failure on takeoff.

The propeller automatic feathering system allows the aircraft to meet obstacle clearance requirements in case an engine fails on takeoff. A 3-position toggle switch, located on the pilot's overhead panel, controls the propeller automatic feathering system. The system is also controlled by 2 secondary arming switches located in the throttle quadrant.

The secondary arming switches are installed in such a way that they are actuated when the power lever position for each engine corresponds to a power lever angle at which 92% to 94% Ng should be produced.

When the 3-position toggle switch is moved to the ARM position, dual indicator lights on each side of the switch indicate ARMED. The indicator lights indicate READY when each respective system is activated.

When the power levers are set for takeoff power or torque and the 2 secondary arming switches are actuated by power lever position, the READY light illuminates after approximately 5 seconds, indicating that the propeller automatic feathering system is activated.

A torque sensor switch mounted on each engine monitors engine power. When the propeller automatic feathering system is ARMED and indicating READY, the engine-mounted torque sensor will close if engine power decreases below approximately 25% torque. When the torque sensor closes, the activation circuit is completed, which will cause the propeller overspeed governor solenoid to activate, allowing for a drop in oil pressure in the propeller hub. This, in turn, will allow the propeller feathering spring to drive the propeller to the feathered position.

The investigation found that, in colder temperatures, the engines might reach their maximum take-off torque setting

before the power levers reach the secondary arming switches in the throttle quadrant. As a result, the READY light never illuminates. This is why some pilots, including the flight crew in this occurrence, do not set the automatic feathering system to ARM. At 16 °C (the temperature at the time of the occurrence flight), the power levers would have reached the secondary arming switches, thus arming the automatic feathering system, if it had been selected to the ARM position.

Wreckage and impact information

The aircraft struck the surface of Eabamet Lake in a level pitch, left-wing-low attitude. The aircraft propeller blades were bent but still attached to their respective hubs and to the engines. The wings and tail surfaces remained attached to the fuselage.

Investigators attended the scene while the aircraft was partially submerged and conducted an examination of the aircraft. The leading edge of the left wingtip had crush damage consistent with the left wing striking the water.

A visual inspection of the cockpit, cabin, and engines was limited to areas above the waterline. The cockpit inspection revealed that the inertial separators were in the icing position for takeoff, and that the aircraft ignition and the propeller automatic feathering systems were turned off.

Initial examination of the throttle quadrant indicated the following:

- The left power lever was in the forward position.
- The right power lever was in the IDLE position.
- The propeller levers were fully forward.
- The left and right engine fuel condition levers were bent and fully forward, but not in the gates.
- Quadrant control friction locks were applied to the engine controls and were in a serviceable condition.
- A continuity check of the throttle quadrant controls to their applicable engine control accessories was completed, with no defects found.

Findings

After lifting the landing gear control handle, with his left hand on or near the throttle quadrant, the pilot not flying may have inadvertently moved the fuel condition levers, cutting the fuel to both engines simultaneously.

Due to insufficient altitude and time available to the crew, none of the 3 engine relight options were available to the flight crew before the aircraft collided with the water surface.

The Board is not aware of any safety action taken following this occurrence. ■

(The preceding were excerpts from the Transportation Safety Board of Canada's investigation report into this occurrence. The Board authorized the release of this report on 15 July 2020. It was officially released on 31 August 2020.)

Aviation Services

Aviation Services

Aviation Services

Burning Money

Boeing responds to ongoing west coast crisis

American Red Cross volunteer Kalen Pippins works hard to keep up with the demands for aid in the state of Oregon.

Sifters are loaded into a truck that will deliver them to families affected by the wildfires in Silverton, Oregon. Sifters will be used to salvage items remaining at burned homes.

THOUGH BESET by its own fiscal problems stemming from the still unresolved 737 MAX controversy, Boeing announced in mid-September it would issue $700,000 in grants from the Boeing Charitable Trust to help local communities with the ongoing humanitarian and environmental crisis caused by wildfires burning along the West Coast of the United States. Boeing is providing $500,000 to the American Red Cross to support its fire relief efforts in Washington, Oregon and California.

"On behalf of Boeing employees across the globe, we extend our heartfelt sympathies to all those impacted by the West Coast wildfires," said Boeing President and CEO David Calhoun. "As these wildfires have ravaged the Western United States, the American Red Cross has stepped up to answer the call at this critical moment of need, and we are happy to support them in their critical work. Through our partnership with the Red Cross, we will help bring recovery and relief efforts to those who have been displaced – and whose lives have been impacted – by these destructive fires."

Additionally, Boeing is donating $200,000 to provide food assistance in these states where significant numbers of the company's employees live and work. $100,000 is being given to Northwest Harvest in Washington, and $50,000 apiece to the Oregon Food Bank and Redwood Empire Food Bank in California.

"Thousands of our families, friends and neighbors have been displaced around the west," said Stan Deal, president and CEO of Boeing Commercial Airplanes and the company's senior executive in the region. "We are committed to helping them through this exceptionally challenging time."

Boeing's grant to the Red Cross will provide shelter, food and essentials for those who have been displaced from their homes due to the wildfires. These funds will also assist in the ongoing evacuation and aid delivery response in impacted communities.

"The Red Cross is working around the clock to help hundreds of thousands of people forced to evacuate from their homes due to the California, Oregon and Washington wildfires. We have taken extra safety precautions due to the pandemic to ensure people feel safe as we support the communities impacted by the wildfires," said Don Herring, chief development officer at the American Red Cross. "We are extremely grateful for Boeing's support, which allows us to provide shelter, food and comfort to help people in need."

Consistent with Boeing employee gift match programs, the company will also match qualifying employee contributions made to eligible nonprofits for wildfire relief efforts. ■

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