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Z Tracing Our Roots Flying and Touring the Natchez Trace, Part 1 *Matthew McDaniel*

12 Aviation Issues 20 Ask the Expert – Takeoff OAT Restrictions *Tom Clements*





16 Feature – Is an NTSB Defined "Accident" Covered? *Kyle White* 26 In History – The Last Seminole *Edward Phillips*

30 Value Added

32 Advertising Index

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Tracing Our Ro

Jackson Falls, Tennessee, (mile marker 404) is one of the most popular stops along the northern Natchez Trace Parkway (NTP). Two overlooks are available and only one-half to one mile (round trip) of easy hiking is required to reach

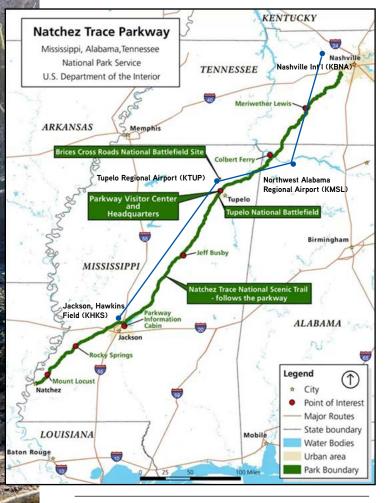
each.

Ots Flying and Touring the Natchez Trace, Part 1

by Matthew McDaniel

All photos are credited to the author unless otherwise noted.

Author's Note: In Part 1, we'll explore the history of sites along the northern threequarters of the Natchez Trace. In the next issue, we'll wrap up the tour, covering the southernmost portions of the route and nearby attractions.

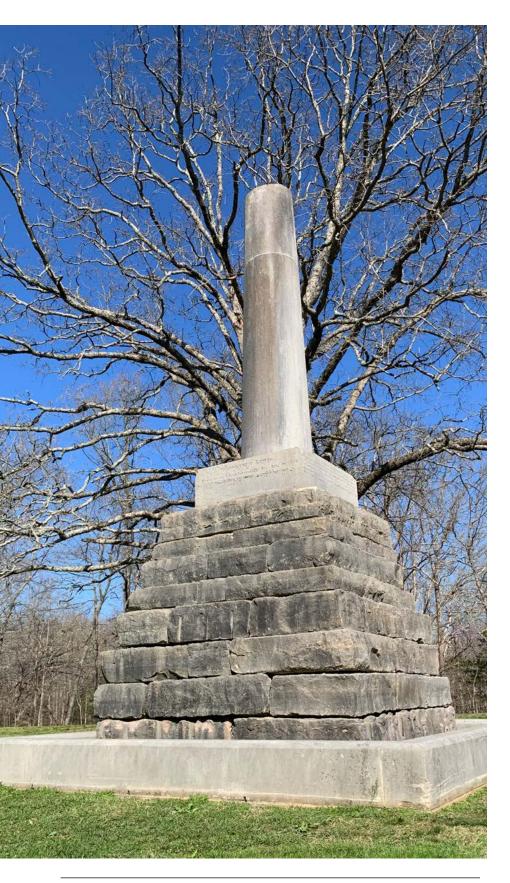


Map of Natchez Trace Parkway. (National Park Service)

s pilots, we all share a common interest in modern transport. Often, we fly just for fun, feeding our passion to be airborne. However, King Air category aircraft are primarily a means of rapid transport. They are magic carpets that, in a matter of hours, cover distances that once took weeks, months or even a year or more.

When an opportunity presents itself to use aircraft to explore a route our ancestors traveled for thousands of years before man ever flew, maybe we should take it. Going fast from place to place can buy us time to enjoy, explore and learn about the place we are in. Such is the journey along one of North America's oldest transportation routes – the 444-mile Natchez Trace.

The entire route could be flown in under two hours if viewed as a simple cross-country flight. From beginning to end, the greatcircle distance is only 355 nautical miles between Nashville International Airport (KBNA) in Tennessee and the Nachez-Adams Co. Airport (KHEZ) in the southwestern corner of Mississippi. Explorations of what lies at each end could easily occupy a tourist for weeks. However, in between, ample



The Meriwether Lewis National Monument is a somber but beautiful spot to reflect upon the life of a man who accomplished so much in such a short time. It stands 200 yards from Grinder's Stand and directly over his gravesite, at mile marker 385 of the NTP. The broken column design represents a life cut short.

airports and opportunities exist to land and take in the sites, history and beauty.

Route, Trail or Trace

Loosely speaking, in traditional French, a "trace" is a line of footprints or animal tracks. In practical use today, the term is interchangeable with "trail." However, pioneering settlers of the New World often used the words independently to differentiate the characteristics of a route. A trail was thought of as a navigable route between points. A trace, on the other hand, tended to avoid water or wetland crossings, often making the total distance between points longer but easier and safer to traverse.

Originally, the Natchez Trace was a travel and trade route of Native Americans (mostly of the Natchez, Choctaw and Chickasaw nations) and dates back at least 10,000 years in that capacity. Many sections of the trail were blazed not by humans but by wildlife. Animals created paths along natural ridge lines of dry ground (avoiding water crossings) to reach grazing lands and/or areas to partake in salt and mineral deposits. Native Americans utilized the foot paths of deer, bison and other large game. Eventually, manmade paths connected the animal paths, and the Natchez Trace took shape. Native settlements sprang up along the route and their prehistoric stories were gathered through the burial mounds and artifacts they left behind. It wasn't until the mid-1700s that European explorers discovered the trace and began to spread the word of its existence. In 1742, a Frenchman wrote of the trail and its miserable conditions. As expected, such explorers relied heavily on assistance from native guides to navigate the trace.

As the 19th century dawned, President John Adams designated the trace a postal route, connecting Nashville with the Mississippi River, deep into what was then only known to Americans as "the southwest." Soon after, peace treaties were

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signed with native tribes in the area and the U.S. Army began formal improvements. Soldiers and civilian contractors labored, at President Thomas Jefferson's behest. Conditions remained deplorable. Workers and travelers alike referred to the route as "The Devil's Backbone" rather than the name Jefferson gave it: "The Colombian Highway." When Jefferson's administration closed the Louisiana Purchase in 1803, upgrading the trace became even more pressing. Its west end, in Natchez, provided direct access to the Mississippi River (the eastern border of the newly acquired territory). By 1809, the trace could be navigated end to end by wagon in two to three weeks. Trading posts and inns soon popped up to support (and profit from) weary travelers. However, highwaymen, bandits and all variety of ne'redo-wells continued to strike fear into travelers along the more remote stretches.

Riverboat men who floated south to sell goods couldn't fight the Mississippi's current to return home. They would sell their rivercraft for lumber in Natchez or New Orleans and travel the trace back north. Grizzlier historical uses included the movement of enslaved people to be sold at markets, forced marches of native people to one of several points where the trace intersects with what is now called the Trail of Tears and movement of military troops during the War of 1812. Half a century later, Union and Confederate troops would wage epic battles near the trace.

The Natchez Trace Parkway

The National Park System (NPS) includes some massive national parks and monuments. Yet, the humble Natchez Trace Parkway (NTP) covers one of the largest geographical ranges of any NPS area. Its long (444 miles) and narrow (800 feet average) shape passes through three states, 25 counties, 22 communities and contains over 350 archaeological sites. First established as part of the NPS in 1938, the modern, paved parkway wasn't completed until 2005. Traffic on the parkway is limited, prohibiting its use for personal or business transportation. This keeps traffic on the parkway light, allowing NTP visitors to move between sites along the trace with ease. The parkway is in like-new condition, making for smooth and peaceful driving.

Speed limits are 50 mph or less along the NTP, making the total drivetime from end to end about 11 hours. However, one can hop on/off the NTP at numerous points. That's where the advantage of aviation comes into play. There are a variety of airports adjacent to the NTP that





The Tupelo National Battlefield commemorates the last Civil War battle to take place entirely within Mississippi. It was an important victory for the Union, helping them to protect supply lines that proved critical in the Atlanta campaign. The park that commemorates the battle is located one mile east of the Natchez Trace Parkway.

allow pilots and passengers to fly in and visit smaller sections of the trace, possibly spending a day or two in/ around one section before returning to the airport to fly on to the next.

The NTP can be traveled in either direction, though it technically begins in Natchez and progresses northeastward. However, since Nashville is more centrally located than Natchez, I'll assume that would be the more common starting point. The various points of interest along the NTP number in the hundreds. Even the official sites noted on NPS maps number many dozens. Seeing it all is next to impossible, so do your research and narrow your focus to suit your tastes – prehistoric and archeology sites, military history, natural features, hiking, historic inns (aka, stands) and trading posts, state parks, modern-era pop culture, etc.

Autumn is considered the best time to visit the NTP, when the fall colors are abundant. However, with its deep south geography, most any time of year will support suitable flying conditions. The peak of summer is likely the least desirable, due to the heat and humidity the region is well known for. Our visit was in springtime and conditions were quite pleasant. Regarding airports for use, I'll stick with the larger options where full services and cars are advertised as available, to ease the transition from aerial arrivals to terrestrial touring. However, never assume regarding services and call ahead.

The North 100 (Tennessee)

Nashville is the perfect launching point to begin exploring the Natchez Trace. Tourism opportunities within Nashville itself are so abundant that they are beyond the scope of this article. Consider scheduling time there in advance of your NTP explorations. Nashville has three controlled airports within its Class C airspace that could all be equally convenient launching points toward the northern sections of the NTP. Smyrna (KMQY) on the southeast side and John Tune Field (KJWN) on the northwest side are both Class D airports underlying the outer shelf of the Class C. Nashville International Airport (KBNA) provides the quickest access to the NTP. Take highway TN-100 to enter the parkway at mile-marker 444 (the terminus). Alternately, take US-31 to the historic city of Franklin, site of a significant Civil War battle, the McGavock Confederate Cemetery and multiple historic properties dedicated to preserving that era's history. From Franklin, the parkway can be entered from TN-96. Either route will provide a view of the double arch bridge at Birdsong Hallow, an architectural masterpiece and the unofficial north gateway of the NTP.

Most points of interest require short walks from the parkway pullouts to the sites themselves. Within Tennessee, some of the most popular are the War of 1812 Memorial, the Gordon House (circa 1818) and the Fall Hallow waterfall. The highlight for me was the Meriwether Lewis Monument and gravesite. The famed co-leader of the Lewis & Clark Expedition returned from that arduous two-year journey unharmed in 1806 and soon became the governor of the Louisana Territory. He left his home in St. Louis in 1809, intending to travel to Washington, D.C., via the Mississippi River to New Orleans, then ship to D.C. He planned to meet with Jefferson and present his journals to a publisher. In Natchez, he decided to travel by land instead, including the entire length of the trace. About a month later, he was just 70 miles southwest of Nashville, taking a night's rest at Grinder's Stand when two gunshots rang out. The

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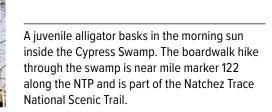
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NTP showcase the hardy nature of baldcypress and tupelo trees, which have buttressed lower trunks and root systems to help anchor them in the soft, wet swamp lands.



following morning, Lewis was found dead. Controversy still surrounds his death, with it officially being ruled a suicide. Yet, ample circumstantial evidence points to robbery/murder. Lewis was only 35.

The Middle Trace (Alabama and Northern/Central Mississippi)

Northwest Alabama Regional Airport (KMSL) is a great second landing point, which serves the Florence and Muscle Shoals area. Though uncontrolled, this field is well equipped with multiple runways and instrument approaches. Roughly 30 miles of the NTP crosses the northwest corner of Alabama, and it is all quickly accessible from KMSL. About a half-dozen points of interest fall within that short distance, the most notable being the Colbert Ferry Stand Site. This Tennessee River crossing point played a major role in both the War of 1812 and the improvements made to the trace throughout the years.

Before departing KMSL, music lovers may want to visit the Muscle Shoals Sound Studio, where the "swampy" southern rock sound is rooted. Rock legends including The Rolling Stones, Cher, Paul Simon, Bob Seger and Aretha Franklin recorded there. Southern rock torchbearer Lynyrd Skynyrd did so, as well. In fact, the swamp lands mentioned in their classic hit "Free Bird" are on full display along the NTP with walks through and views of various cave springs, sloughs, bottoms and creeks. The Alabama Music Hall of Fame is also nearby. The music theme can be carried into the next stop, too.

Only 50 miles or so across the state line into Mississippi, the Class D Tupelo Regional Airport (KTUP) awaits. Tupelo is most famous as the birthplace of Elvis Presley. He and his parents lived there until he was 13. Then, looking for a better life, they loaded their meager possessions into a sedan and moved to Memphis. The house where Elvis was born in 1935 is preserved, even though the family was forced to leave it when Elvis was only 3. His father was unable to repay the \$180 loan he'd secured to build the home. The two-room dwelling is now part of a museum dedicated to the King of Rock 'n' Roll.

Centrally located along the NTP, the Parkway Visitor Center is just north of Tupelo. As with any NPS site, a stop at the visitor center can provide helpful information and touring tips. Trace State Park is just southwest of Tupelo and is one of the areas where visitors can hike original sections of the "Old Trace." The last Civil War battle within Mississippi is commemorated within the Tupelo National Battlefield and other Civil War battlegrounds and graveyards are nearby. Thirty miles south of KTUP are the Bynum Mounds. While there are many native burial mounds along the trace, these are the oldest (dating 100 B.C.E.–100 C.E.). They are also the most easily accessible and close-up via paved pathways. If you'd prefer to fly there, the Houston Municipal Airport (M44) is nearby and perfectly suitable. However, no Jet-A fuel is available and ground transportation should be prearranged.

Another 100 air miles south of M44, is the Mississippi capital city of Jackson, where like Nashville, three airports are available. The principal being the Class C Jackson-Medgar Evers International (KJAN). While KJAN is the best in terms of services and facilities, it is also the most expensive and farthest from the NTP (though only about 10 miles). If you want to take in some of the city sites of Jackson, Hawkins Field (KHKS) is the downtown airport. It is Class D, underlying the outer ring of the Class C, advertises crew cars available and is closer to the NTP. Additionally, it is the nearest to downtown attractions such as the State Capitol Building, the Mississippi Civil Rights Museum and the Museum of Mississippi History. Finally, there is Bruce Campbell Field (KMBO), an uncontrolled field also under the Class C, on the north side. KMBO is perfectly situated, mere minutes from NTP, with suitable runway, approaches and fuel available. Rental cars would have to be prearranged there, however.

Two prominent features of central Mississippi are several Old Trace stand sites and the towering cypress trees with impressive exposed buttress root systems. The old stands are sprinkled all along the NTP in this area and each offers a slight variation in the history of the trace and its travelers. Fifteen miles north of Jackson (near NTP mile marker 120) is a beautiful hike through the Cypress Swamp. The water tupelo and baldcypress trees have extraordinary abilities to thrive in such places. They take root at the peak of summer when the swamp is nearly dry, but thereafter can survive as seedlings while fully submerged. Boardwalks will keep your feet dry as you trek across the wettest areas. The swamp walks/ hikes along the NTP are not the smelly, mosquito-infested scenes you might imagine. They are pristine cypress forests with colorful water features, teeming with wildlife and natural wonder.

In Part 2, we'll cover the South 100 portion of the NTP, including the most prominent Civil War battlefield of the Old South as well as the antebellum wonders of Natchez and southern Mississippi.

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Matthew McDaniel is a Master & Gold Seal CFII, ATP, MEI, AGI and IGI and Platinum CSIP. In 35 years of flying, he has logged over 22,000 hours total, including over 5,900 hours of instruction-given and over 2,500 hours in various King Airs and the BE-1900D. As owner of Progressive Aviation Services, LLC (www.progaviation.com), he has specialized in Technically Advanced Aircraft and Glass Cockpit instruction since 2001. Currently, he is also a Boeing 737-series captain for an international airline, holds eight turbine aircraft type ratings and has flown over 140 aircraft types. Matt is one of less than 15 instructors in the world to have earned the Master CFI designation for 11 consecutive, two-year terms. He can be reached at: *matt@progaviation. com* or 414-339-4990.

AVIATION ISSUES



Affected Operators Should Act Now on Expanded SMS Mandate

Per the National Business Aviation Association (NBAA), a new Federal Aviation Administration (FAA) rule expanding safety management systems (SMS) to Part 135 on-demand operators, certain Part 21 certificate holders and 91.147 air tour operations may pose challenges to business aircraft operators as they work to adapt the rule's requirements to their specific operations.

The 160-page final rule, effective May 28, applies the FAA's existing Federal Aviation Regulations Part 5 SMS requirements, currently mandated for Part 121 commercial airlines, to nearly 1,850 Part 135 operators and more than 700 air tour providers. Affected operators will have until May 28, 2027, to submit a declaration of compliance to the FAA saying they have met the new rule's requirements.

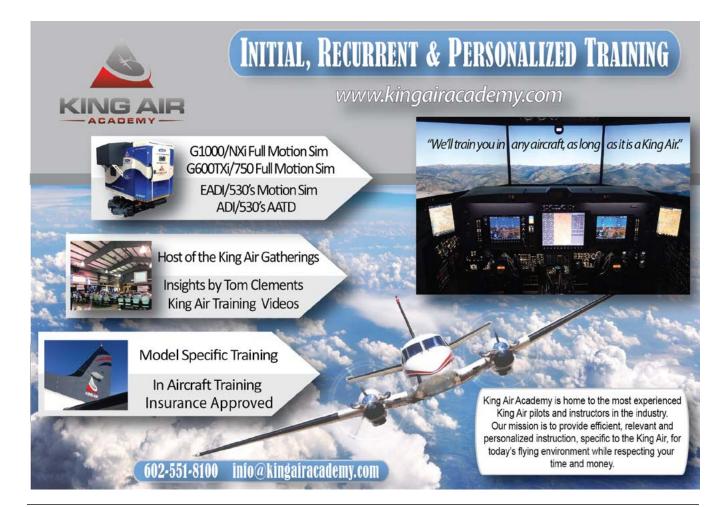
The new rule includes most of the criteria advocated by NBAA and other industry stakeholders "over many, many years," according to Doug Carr, NBAA senior vice president, safety, security, sustainability and international affairs. However, Carr also noted that work remains to be done to ensure the rule's smooth implementation for types of operations.

"We're now at a stage where we have an opportunity to really dive into SMS as a formal component of what Part 135 on-demand operations and air tours have in terms of a baseline requirement," Carr said in an April 25 NBAA News Hour webinar detailing the rule's requirements. Those with an existing SMS may only need to adapt the FAA language from the final rule, added Gil Lopez, Certified Aviation Manager (CAM), vice president of operations at Leviate Air Group. Operators just starting on SMS implementation may face more difficulties.

"If you don't have an SMS, there is no out-of-the-box solution," Lopez said. "Get educated [and] become more comfortable with the idea of the process."

Operators need to act now, added Aviation Safety Solutions CEO Amanda Ferraro, CAM, who works with airlines and business aviation operators to develop SMS. "This is not a case of filling out the declaration of compliance statement and then putting your processes into place."

The rule marks a thoughtful approach overall that will ultimately make business aviation safer, said Ben van Niekerk, standards captain at Part 135 operator GrandView Aviation and CEO of Total Quality and Safety Management Solutions. "The new rule includes most of the criteria advocated by NBAA and other industry stakeholders 'over many, many years,' ... "



SMS OVERVIEW

Source: FAA.gov

A Safety Management System (SMS) is a formal, top-down, organization wide approach to managing safety risk and ensuring the effectiveness of safety risk controls.

An SMS is made up of four components:

- Safety Policy
- Safety Risk Management
- Safety Assurance
- Safety Promotion

Safety Policy

The Certificate Holder's documented commitment to safety, which defines its safety objectives and the accountabilities and responsibilities of its employees regarding safety.

Safety Risk Management

A process within the SMS composed of describing the system, identifying the hazards, and analyzing, assessing, and controlling safety risk.



Safety Assurance

Processes within the SMS that function systematically to ensure the performance and effectiveness of safety risk controls and that the organization meets or exceeds its safety objectives through collecting, analyzing, and assessing information.

Safety Promotion

A combination of training and communicating safety information to support an organization's safety performance and safety culture.





Implementation Timelines Specifics Part 135 Applicants and Certificate Holders		
Current Status	How much time you have to develop and implement SMS?	
Applicants on the Applicant List (per Notice 8900.687) before May 28, 2024	36 months – May 28, 2027	
Applicants in the Initial Certification Phase before May 28, 2024	36 months – May 28, 2027	
New applications submitted on or after May 28, 2024	Upon certification	
Applications in Preapplication Phase on or before May 28, 2024	Upon certification	
Operators certificated before May 28, 2024	36 months – May 28, 2027	

"A mature, well integrated SMS makes a huge difference," he added. "I really encourage operators to [adopt] Part 5 – it's a proactive tool, it boosts morale and it's a really effective management tool."

"Resources are available," said Mark Larsen, CAM, NBAA director, safety and flight operations and the webinar's co-moderator alongside Carr. "It's a journey we're all in together to improve safety for all of business aviation."

"SMS isn't the bear to be afraid of," Carr added. "In fact, in many cases, it can be a simple tool that will help your organization understand where risks exist and then ways to potentially mitigate those risks."

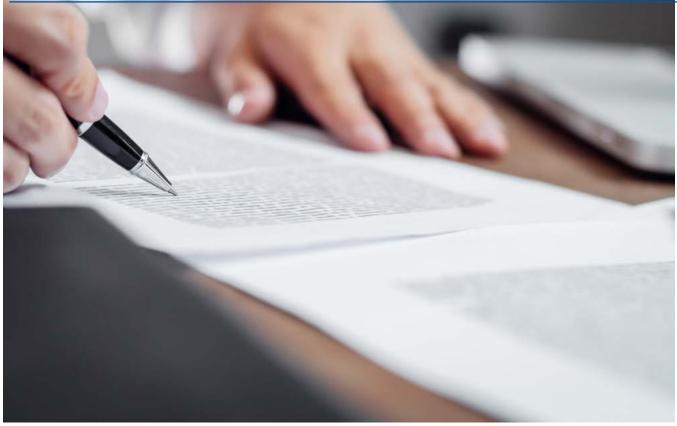
To review NBAA's resources on SMS, go to: https://nbaa.org/flight-department-administration/sms/.

Source: NBAA.org



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FEATURE



Is an NTSB Defined "Accident" Covered?

by Kyle White

t's a beautiful day to fly "CAVU" over the desert Southwest. As a diligent pilot, you keep your eye on the map for the nearest airport should there be an emergency. You glance out the side window to take in the beauty of the Grand Canyon when suddenly you hear a "BANG" and a rush of air. Almost instantly, your headset is ripped off, your sunglasses disappear, and the reverberation in the cockpit is like that of your car with the sunroof open on the highway but a hundred times more intense.

Before you can even begin to process what has just happened, your training kicks in. You reach for the oxygen mask as other equipment and loose items continue to fly out. You note the autopilot has kicked off, which isn't a problem because it's time to hand fly down to a breathable altitude and head to the nearest airport. Trying to maneuver an airplane to "get down" and "slow down" at the same time can be a difficult task in normal conditions. In an aircraft without a windshield and cold wind whipping against your face, trying to communicate with ATC as to why you are squawking 7700 and rapidly departing your assigned altitude is extremely complicated.

Once you reestablish communication with ATC and the controller grasps the situation you are in, you receive any clearance you need. The young crew in the regional jet that was headed to the same airport you now need is directed to slow down because you are now "No. 1" for landing. They, too, are in disbelief of what they are hearing. They have been following the radio communication and had been asked by ATC if they could get you on frequency when they were unable to. Once you safely land and begin taxiing your new convertible to the tarmac, the reality of what you just experienced begins to hit you. This is a logbook entry you will not forget. The last 21 minutes put you in an experience you never could have imagined.

The next morning you contact your insurance broker to recount the story and initiate the claim process. Clearly this is something that will be covered by insurance, right? Once again, the answer depends on many things.

It truly seems that no two insurance claims are the same. However, despite the negative reputation insurance companies have, it is rare that a claim is denied. After all, aircraft policies are "all risk." All risk policies do come with a page or two of what is not covered or what could be only partially covered. In the September 2023 issue of King Air magazine I wrote the article, "It's Covered ... Unless It Isn't." It was a high-level view that discussed many of the nuances of an aircraft policy and briefly referenced the "wear and tear and mechanical breakdown" exclusion. The scenario I gave then "The burden is on the insurance company to prove that the cause of the claim warrants denial. Until then, assume it is covered."

was fuel leaking out of the plane as it sat in the hangar overnight. This blown-out windshield falls under the same section of the policy. The inflight decompression will have the NTSB leaning toward defining the occurrence as an "accident." But that does not determine how the insurance company will see that situation – covered or denied? To determine how your policy will respond, refer to the "Exclusions" section and reference the "Definitions" page. The policy I am referencing for this article is titled "Part Two Exclusions." Under Exclusion 7(e) the policy reads:

"This insurance does not apply to **loss** due and confined to wear,



tear, deterioration, corrosion, freezing, mechanical, structural, hydraulic, pneumatic or electrical failure, malfunction or defect. Wear, tear, deterioration, corrosion, freezing, mechanical, structural, hydraulic, pneumatic or electrical fire, malfunction or defect of any engine, component, accessory, equipment or system is considered a failure, malfunction, or defect of the entire engine, component, accessory, equipment or system."

"Loss" is in bold because it is defined on the Definitions page, "Part Five," of this particular policy. "Loss" is simply defined as "**physical damage**." Further digging into the definitions finds that "physical damage" is:

"Direct and accidental physical loss of or damage to the aircraft, hereinafter called loss, but does not include loss of use or any residual depreciation or diminution in value (including loss of guaranty or warranty), if any, after repairs have been made."

A simple scenario of when this loss would be covered would be if you hit a bird in flight. That should be covered. A situation where it could be denied? If the windshield is 40 years old and blew out because of fatigue in the structure that holds the windshield in place that could result in a denied claim. As we referenced above in the policy definitions, the exclusionary wording could imply this was a structural or mechanical failure if there is no evidence of a foreign object, such as a bird, striking the



window to cause the blowout.

There may be a middle-of-the-road scenario where the structure that failed is not covered, but the damage resulting from the failure is. For example, in a different claim scenario, upon landing one of the tires blows and causes damage to the underside of the wing. The tire may not be covered because it failed, but the damage to the underside of the wing would be.

As your claim process starts, the insurance company will investigate to try and determine what caused the massive decompression that resulted in physical damage to the aircraft. Could the pressurization system have failed? Did the rivets or structure surrounding the window have corrosion? Either scenario could have caused the windshield to blow out. In any claim situation the insurance company has the duty and obligation to the aircraft owner to inspect the damage and potentially hire an additional party to determine the cause of the incident. With the potential unknowns in any claim situation, it is critical that you proceed with formal notice of your claim in a manner that does not unintentionally negate coverage.

When filing a claim, treat it like you would an encounter with a Federal Aviation Administration (FAA) inspection or check ride. Answer the questions in a direct and honest manner. Do not speculate or hypothesize. The last thing you want to do is unintentionally be "exhibit one" on why your claim was denied. The burden is on the insurance company to prove that the cause of the claim warrants denial. Until then, assume it is covered. When in doubt, pick up the phone and call your broker, who should be your coach in this unfamiliar territory. They most likely see claims on a weekly basis and can advocate and work with you during the process. Occasionally, your broker may recommend that you reach out to an aviation-specific attorney for consultation. Your insurance policy is a legal contract between you and the insurance company. Every word in the document is intentional. Sometimes, especially in times of uncertainty and emotion, attorneys can be the best advisers. KA

Kyle P. White is an aviation insurance specialist for a global insurance brokerage company. He has professionally flown King Air 90s and B200s and holds an ATP and multi-engine instrument instructor license. You can reach Kyle at *kpwhite816@gmail.com*.



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Takeoff OAT Restrictions

by Tom Clements

've been asked about engine ice vane usage on the ground. Specifically, a concern was expressed about a temperature restriction stated in the Pilot's Operating Handbook (POH) for the model 200-series. Is a limit being violated at times when ice vanes are being used?

I've had a similar concern for the 300-series. I plan to review and discuss these questions and more in this article.

Realize that all King Airs have an OAT limit above which they are not allowed to operate. In almost all cases this is expressed as ISA + 37°C. "Golly, 37°C is only 98.6°F, so there'll be many times that we cannot fly!"

many folks think. Wrong! The 37°C temperature is not the same as "ISA + 37°C." ISA stands for "International Standard Atmosphere," the engineering-accepted model of the average worldwide atmosphere. This is the one with a Sea Level temperature of 15°C or 59°F and a lapse rate of 2°C for every 1,000 feet up to the stratosphere that starts at FL350. ISA + 37°C is a shorthand way

of saying, "The OAT that is 37°C above the standard temperature for that altitude."

Therefore, at Sea Level, the King Air's limiting OAT for operation is 52° C (15 + 37). This equates to about 125°F. Does it ever hit that sweltering temp? Sure, but it's quite rare. Can you figure out what the limit is at 10,000 feet? Since the standard atmosphere experiences a drop of 2°C for every thousand feet, we would have decreased 20° from Sea Level to 10,000. That puts ISA at -5°C. Adding 37 more gives 32°C, or about 90°F ... mighty warm at 10K!

I heard from experimental flight test colleagues at Beech that the limiting factor for hot weather operation is the size and capability of the engine oil cooler. We all know that performance decreases as temperature increases. Although performance would definitely degrade, the actual reason why there is an OAT limit is based on the ability of the oil cooler to keep the oil temperature from exceeding its limit. As a side note, the fact that the Blackhawk XP67A engine modification to the 350 adds a fixed "cowl flap" at the oil cooler's outlet vet still has an OAT limit 3° cooler than before - ISA + 34°C now – lends support to the assumption that oil cooling is the reason for the OAT limit. (If that poses an operational problem for XP67 airplanes based in hotter climates, a larger oil cooler is available that brings the OAT limit back up to the original value.)

" ... the actual reason why there is an OAT limit is based on the ability of the oil cooler to keep the oil temperature from exceeding its limit."

When the model 200 first appeared, its POH stated that engine ice vanes could not be extended when the OAT exceeds 15°C. This applies to all operating conditions, including ground and flight. Again, we return to oil cooling considerations. Unlike the King Airs that preceded the 200 and those that came later with the "Pitot Cowl" design, the cowling used for the 200 series is unique. When the ice vanes are extended, the "bypass door" also opens to allow the deflected ice particles to harmlessly leave the cowling. Oil cooling suffers now



because the bypassing air can no longer flow across the oil cooler's fins. From its market introduction in 1974 until the 1993 model year, the +15°C ice vane limitation was heeded with no operational difficulty experienced.

In 1993, beginning with serial number BB-1444, the B200 incorporated many welcome improvements. Among these were the advent of four-blade propellers as standard equipment, replacing the three-blade Hartzell and McCauleys of the past. The higher low idle compressor speeds and flatter low pitch stop blade angles - required to ensure that propeller speed remained above the new minimum propeller speed limit, a limit imposed to avoid the "reactionless vibration" mode that may lead to propeller damage - conspired to make FOD (foreign object damage) much more likely. Soon after the 300 model made its appearance in 1984, reports began arriving at Beech of numerous cases of first-stage compressor FOD on the PT6A-60A engines used on this new model. The distance from the propeller tip to the ground is less in a 300 than in a 200. Combining that fact with the 300's pitot cowl and four-blade standard propellers with higher idle speeds, FOD became much too common!

The easy solution was to change the procedure so ice vanes – now correctly called "engine anti-ice" on the

later King Air models – were deployed for all ground operations. The location of the oil cooler in the pitot cowl prevents oil cooling from being negatively impacted due to engine anti-ice activation. Thus, there really was no downside risk associated with this new procedure of "Ice vanes extended for all ground ops."

Therefore, when this same FOD worry started affecting B200s of 1993 and after design – as well as earlier 200s and B200s that were now being retrofitted with fourblade props – the solution was easy ... copy the 300 technique and use ice vanes all the time while on the ground. Oops! What about that $+15^{\circ}$ C limit that applies to the 200-series but not the 300-series?

For a few years, the limitation was basically ignored. Personal observation has convinced me that it is extremely rare for oil temperature to hit the maximum redline even in Phoenix, Arizona, in the summer months with a lengthy ground delay. Whew, I am happy for that! Then Beech got around to revising the POH and removing the +15°C limit. Now there is a "Note" in the "Before Engine Starting" section of the normal checklist that reads as follows: "The engine ice vanes should be extended for all ground operations to minimize ingestion of ground debris. Turn engine anti-ice off, when required, to maintain oil temperature within limits."



If you, unlike I, do indeed find that you must turn engine anti-ice off because of hot oil, then avoid using beta and reverse even if it means riding the brakes at times.

Under the title of "Icing Limitations" found in Section 2 of the B200's POH it states: "ICE VANES, LEFT and RIGHT, shall be extended for operations in ambient temperatures of +5°C or below when flight free of visible moisture cannot be assured." The next

"If you, like many pilots, fly a variety of King Air models, then there is absolutely nothing wrong with making 'ice vanes down for all ground ops' your SOP ... " statement is: "ICE VANES, LEFT and RIGHT, shall be retracted for all takeoff and flight operations in ambient temperatures of above +15°C."

It is obvious that FOD due to ground debris is not a problem in flight. It is also not a problem during takeoff unless the takeoff is aborted and reverse remains in use to too low of an airspeed. Hence, when doing the runway lineup procedure on warmer days, it is time to retract the vanes. Not only is better oil cooling assured but more takeoff power can now be achieved with less chance of being ITT-limited.

Now let's examine the 300-series "Icing Limitations" found in Section 2 of its POH. This one is nearly identical to the 200, except for substituting "Engine Anti-Ice" for "Ice Vanes": "ENGINE ANTI-ICE, LEFT and RIGHT, shall be ON for operations in ambient temperatures of +5°C or below when flight free of visible moisture cannot be assured." The next statement is: "ENGINE ANTI-ICE, LEFT and RIGHT, shall be OFF for all takeoff and flight operations in ambient temperatures of above +10°C."

Do you notice what is different between the 300 and 200 in the second limitation? The ambient temperature dropped by 5° : +10°C for the 300 and +15°C for the 200. Why the difference?



Since the pitot cowl of the 300 negates any oil cooling worry, the reason has nothing to do with the oil cooler's effectiveness. Rather, it comes from wanting to ensure proper takeoff performance. When there is no need for ice protection, why subject the engine to the slight power loss that goes hand-in-hand with ice vane deployment? The "Minimum Takeoff Power" numbers – from the graph in the Performance section of the POH – are based on the assumption that ice vanes will not be deployed during takeoff when unneeded.

In a similar manner, this helps explain the 300-series' POH statement that, on first reading, makes no sense: "For takeoff, Generator Load must not exceed 30% with air conditioning on, nor 50% with air conditioning off." Since the condenser blower operates whenever AC is operating with the nose gear extended, and since this blower uses about 50 amps, it seems that the generator load would be higher, not lower, with AC on. Right? Yes, that is correct ... but it's not what the restriction is addressing.

The engine is subject to three things that can cause available takeoff power to be less than optimal even though the engine itself is fine: (1) Cowling inefficiencies caused by ice vane deployment; (2) Compressor shaft load or drag caused by the need to drive the AC's compressor (on the right engine); and (3) Compressor shaft load caused by generator load (on both engines). If we have



little electrical load – no electric heater or windshield heat in use – then we can abide by the AC drag and still have sufficient power available to the propeller to meet takeoff power design criteria. However, if the generators are working their guts out, then we don't have enough "leftover" power to load up the compressor with the AC's compressor drag.

To summarize then, the 300's requirement to not use engine anti-ice for takeoff when OAT is above +10°C is based not on oil cooling concerns but instead is based on eliminating the cowling inefficiencies that could lead to the inability to meet the Minimum Takeoff Power target torque.

For all of the other King Air models – 90-series, 100-series – you, like the 300-series, have no tie-in between ice vane deployment and oil cooling. If you have a three-blade propeller, especially if it's combined with the original "Chin" style of cowling, there is no concern about FOD due to ground debris even with the ice vanes retracted. On the other hand, four-blade props combined with the pitot cowl – F90-1s, C90As and after – have enough FOD potential that engine anti-ice ON while on the ground is strongly recommended.

But consider this: Leaving the ice vanes up on a fourblade 200 or any member of the 300-series is asking for FOD ... leading to a very expensive repair. But having the ice vanes down on your B90 causes no problems whatsoever. If you, like many pilots, fly a variety of King Air models, then there is absolutely nothing wrong with making "ice vanes down for all ground ops" your SOP (Standard Operating Practice). Are ITTs affected? Is engine starting affected? No! The only negative associated with this procedure is forgetting to retract them when taking the runway and hence being unable to attain your target minimum takeoff power.

I'll leave you with this thought, readers: Forgetting to retract the ice vanes for takeoff may not be as bad as you think. Why? Because the ram air loss at takeoff speed – 100 knots? – is much less than what you are used to seeing when you pull those ice vane handles out (or activate the switches) before entering that cloud deck below you while in a descent going 200-plus knots.

King Air expert Tom Clements has been flying and instructing in King Airs for over 50 years and is the author of "The King Air Book" and "The King Air Book II." He is a Gold Seal CFI and has over 23,000 total hours with more than 15,000 in King Airs. For information on ordering his books, contact Tom direct at *twcaz@msn.com*. Tom is actively mentoring the instructors at King Air Academy in Phoenix.

If you have a question you'd like Tom to answer, please send it to Editor Kim Blonigen at *editor@blonigen.net*.

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The Last Seminole

In the late 1950s, the U.S. Army's inventory of the versatile L-23/U-8 Seminole series of light military transports ended with introduction of the L-23F – the versatile Beechcraft that set a new standard for fixed-wing Army aviation.

by Edward Phillips

hirteen years after the end of the bloodiest conflict on earth known as World War II, Americans were riding the crest of a major postwar economic wave that put a car in every garage and Dwight D. Eisenhower in the Oval Office. It was a time like no other. Consider just a few of the distant memories from that generation: Detroit's General Motors Corp, Ford and Chrysler went wild with tailfins, loads of chrome and gas-guzzling V-8 power. Drive-in theaters dotted the landscape, Wonder[®] Bread was in every kid's lunchbox, Elvis was swinging his hips (but not on national TV!); nuclear fallout shelters were all the rage, pretty girls on roller skates served food to cool guys in "hot rods," and color television was the technological marvel of the day.

In addition, the "Atomic Age" ushered in by the bombing of Hiroshima and Nagasaki in 1945 had slowly given way to the "Space Age," with the United States and the Soviet Union vying to put elementary satellites into earth orbit while quietly racing to see who would be first to successfully launch a man into outer space. It was also an uncertain time when the Cold War between the two nuclear superpowers was heating up and would eventually come to a high-stakes standoff in Cuba in 1962 that threatened to plunge humanity into a global nuclear holocaust.

In the world of commercial aviation, however, the late 1950s saw the "Jet Age" mature with introduction of jet-powered airliners such as the British Comet and the Boeing 707. The market for small, piston-powered aircraft was enjoying strong growth and production lines were humming at Cessna Aircraft Company, Piper Aircraft Corporation and Beech Aircraft Corporation. Beech, in particular, was strengthening its grasp on the business aviation segment that had begun in 1932 with the bullish Model 17R1, evolved into the affordable and efficient Model 17 Staggerwing during the mid-1930s and hit its stride after the war with strong sales of the twin-engine Model 18 Twin Beech.

The U.S. military had long been an operator of Beechcraft airplanes and the company's successful Model 50 Twin Bonanza had donned the uniform of the U.S. Army in 1951 with introduction of the L-23 Seminole. The light transport proved to be a rugged, versatile addition to the Army's fixed-wing inventory, and the L-32A was soon followed by a series of upgraded and modified aircraft over the next seven years culminating in the L-23D of 1957.¹

Although the Army brass were more than pleased with the overall L-23 design, by 1958 it needed a larger airframe to cope with evolving mission requirements that included increased VIP transport, rapid troop deployment and myriad liaison duties. What the next-generation Seminole needed, according to the Army, was more interior volume and horsepower, and in 1958 the Army sat down with Beech engineers to lay out the basic requirements for a follow-on design to the L-23.

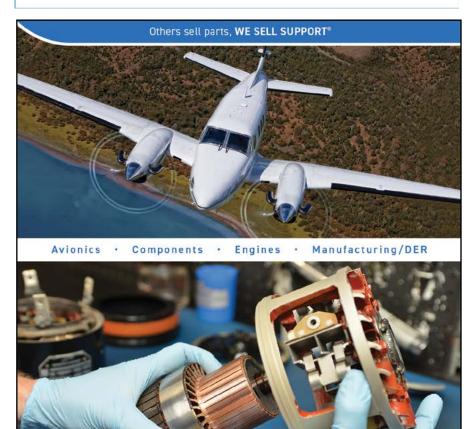
Fortunately for the Army, the solution was just beginning to roll down the Beechcraft production line – the Model 65 Queen Air. First flown in August 1958, the Model 65 differed

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significantly from its Model 50-series predecessors because of its redesigned fuselage and that included a cabin that had been completely regenerated in terms of length, width and height. Those modifications gave the new Beechcraft the type of true multi-mission capability the Army needed.

For example, in its high-density cabin configuration the airplane could deploy up to seven combat-ready soldiers and their gear. By removing the seats, up to 1,350 pounds of cargo could be loaded, and the airplane lent itself well to further modifications such as the RL-23F that featured battlefield surveillance radar systems to collect combat intelligence information.

As part of the fuselage redesign, three large windows were added to the cabin for increased visibility with a smaller, fourth window in the aft cabin section. In 1959 when Beech Aircraft began delivering the Queen Air to customers, the Army acquired three airplanes designated as the L-23F. From the Army's viewpoint, the latest generation Seminole was a heavy-piston, twin-engine airplane with a maximum gross weight of 7,368 pounds (increased later to 7,700 pounds) with a wingspan of 45 feet, 10.5 inches. The airplane was powered by sixcylinder Lycoming fuel-injected, geared, supercharged, opposed piston engines each rated at 340 hp (Lycoming IGSO-480-A1A6, –A1B6 or A1E6).

Maximum cruising speed was 214 mph and the L-23F could climb to a maximum service ceiling of



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JENNA REID, ADVERTISING DIRECTOR JENNA.REID@VPDCS.COM 816-699-8634 27,000 feet and had a range of 1,445 statute miles. The engine's fuel injection system was designed and built by Bendix and featured automatic mixture control to reduce pilot workload and improve engine efficiency (a manual mixture control system was installed in case the automatic system failed).

From 1960 until production was terminated in 1963, Beech Aircraft records indicate that the company delivered 71 examples of the L-23F to the Army, but other records indicate 76 airplanes were built.² The fleet of sturdy Beechcrafts served the Army well and a number were still in service with National Guard units as late as 1986. The military designation changed in 1962 from L-23F to U-8F.

As mission demands continued to evolve over the years and performance improvements became available, in 1984 the Army's National Guard Bureau upgraded the engine installations in a majority of the L-23F/U-8F aircraft to eight-cylinder Lycoming fuel-injected, opposed engines fitted with three-blade Hartzell propellers (the modification also included installation of new engine mounts). These changes were part of an FAA-approved, major modification to the original Beechcraft design, and was developed by Excalibur Aviation Company in San Antonio, Texas.

As the decade of the 1950s faded into history, aviation propulsion technology had progressed to the point that turbine power was coming of age for business aircraft such as the Queen Air. The Beech Aircraft Corporation was among the first to take the bold step of installing a turboprop engine in a modified Model 65 airframe, thereby creating the legendary *King Air*. But that is another chapter in the Beechcraft story.

Endnotes:

- 1. Phillips, Edward H.; "Beechcraft—Pursuit of Perfection;" 1992, Flying Books (Also see "King Air," November/December 2010 issue, Page 26-27, for background on the Model 50 and L-23 series airplanes)
- 2. Harding, Stephen; "U.S. Army Aircraft since 1947;" 1990, Airlife Publishing, Ltd.

Ed Phillips, now retired and living on the East coast, has researched and written eight books on the unique and rich aviation history that belongs to Wichita, Kansas. His writings have focused on the evolution of the airplanes, companies and people that have made Wichita the "Air Capital of the World" for more than 80 years.



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Hartzell Launches Propeller Core Purchase Program

The Hartzell Service Center in Piqua, Ohio, is introducing a purchasing program for used serviceable propeller cores and serialized parts directly from aircraft owners, fleets and MROs. The enhancement aims to help reduce overhaul lead times, while giving customers more buying options when acquiring parts.

At Hartzell's discretion, customers can reduce the purchase price of a new or used Hartzell propeller by selling their existing serviceable propeller of any general aviation aircraft make or model. All core purchases require complete logbook information detailing maintenance history, applicable 8130-3 certificates and a recorded Time Since New (TSN).

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Western Aircraft Now a Starlink Dealer and Installer for King Air 200 & 300

Western Aircraft of Boise, Idaho, has officially become an authorized dealer and installer for Starlink, the satellite-based internet service developed by SpaceX. Starlink's technology enables inflight 4K video calls, streaming, online gaming and secure virtual private network (VPN) connections. With more than 6,000 satellites in low Earth orbit and more being launched regularly, Starlink boasts the largest satellite constellation in the world.

Western Aircraft currently offers Starlink for Beechcraft King Air 200 and 300 series models, and additional Starlink STCs are currently in development that Western Aircraft will be able to offer in the future.

Aero Center Atlanta Joins SmartSky® Dealer Network

SmartSky recently announced that Aero Center Atlanta has joined the SmartSky dealer network as a sales and installation partner. With seven FBO locations across the U.S., Aero Center is a full-service management, charter and FBO provider, which also offers Part 145 maintenance services – including connectivity upgrades for business aircraft – at the Atlanta location.

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Blackhawk Modifications Inside Front Cover	Good Spirit Air21	Stevens Aerospace & Defence Systems Back Cover
BLR Aerospace23	Ice Shield/SMR Technologies14	VAC-Veterans Airlift Command25
Butler Avionics 17	Innovative Solutions & Support9	
CenTex AerospaceInside Back Cover	King Air Academy13	
Cleveland Wheels & Brakes	Lighthawk27	



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