Chris D'Acosta Sun'n'Fun 2025

[00:00:00] **Chris D'Acosta:** ..been selling for 10 years and now that's going to convert into the hundred octane fuel. So some people that are eager to use the hundred octane fuel you, you buy the same STC, we call it a forever STC. You pay a hundred dollars, you get our kit, which is a placard, and other information, flight manual supplement, things like that. It all comes as a kit. And then once you apply that to your airframe, you're good to go. And as new, let's call it upgrades to our certification from the FAA. As those come, you get all those for free, and it applies to a tail number. So if your engine changes or something about your situation changes, if you've already, if the tail number has already got the STC, all the future features come to that tail number.

You sell the airplane, it goes with your tail number. So the new guy gets what he had in terms of that, uh, configuration of, uh, certification package. The map I just showed you is on the lower left US map, uh, the frequently asked questions and there's a whole bunch, kind of a hodgepodge of different things that come up about all of our fuels.

We talk about lots of issues of FAQ uh, News is really some videos, some press releases, things like that. Most of the time when the new airport brings its fuel, they'll issue a press release and we'll normally share that so you can see it. And at any time, any, for any reason, you need to contact us. That lower button, you can fill it out and we know how to respond back to you all.

That's on the swiftfuelsavgas.com. So our UL 94 product, we've been describing it as FAA certificated for the US piston fleet for 75% of the US piston fleet. So what does that mean? So you have to watch my hands here. So the, if, if, if this full range is the entire, uh. a set of aircraft in the United States, let's say just the United States that fly, there's a chunk over here, which is non certificated.

Those are experimental and other type, other classifications of airplanes. That's about 35, 40, 45 thousand airplanes out of 225,000. The bigger chunk is FAA certificated. Those are things that come through the FAA process, and the STC applies to FAA certificated aircraft. Experimental aircraft are under the control, the FAA in effect is the, is the owner operator, the OEM of the aircraft. That person has the authority to basically speak for the FAA for his or her aircraft. So we work with both certificated, which comes from the STC and experimentals. Uh, in terms of what they individual owners need in order to themselves certificate the airplane.

But this chart's talking about the certificated fleet, and there's really three dimensions to what, to how the market understands uh, ready to fly. Ready to fly means you have an FAA certificated, in this case, STC. So that certificate, the STC. Comes from the FAA, which we also have for UL 94, all sorts of endorsements from the OEMs.

So like only Continental, Rotax, Textron Aviation, uh, Robinson Helicopter, people like that. All the engine and airframe mobiles have also written the endorsements for UL 94 on top of an FAA STC. And then we also have a third thing. We have an ASTM International specification. It's called D7547. I'm talking on the left side of the page.

So we've gone through ASTM, which is a, you'll hear more about it in my talk today, but those three things together convey what it takes. What it's taken for us to have UL94 in the market, you know, confirmed and, and available and utilized by everybody. 'cause we passed all three critical hurdles to make it justified.

And we're on a, and that's now, and we're on a path to have the same exact set of things for 100R 100 octane fuel. So we're, our goal is to have the FAA certificates, uh, applied and informed in the next few weeks and months. Along with the OEM endorsements, along with the, uh, ASTM international type, uh, standard fuel standard.

So we're working on all those things, and you'll hear me talk today about all the work we're doing on those things. But at some point soon, sometime in 2025, we hope to have all those in place. So we'll mirror the 94 footprint with 100 octane fuel's uh, scope and then additions to that will occur over time as we work with the FAA, with the OEMs to get more and more and more things applied to it.

That's what's happening. So we've recruited a bunch of, but really they recruited themselves. We have a bunch of, uh, so-called ambassadors, people who signed up with us to help represent Swift in the marketplace. So if I go down this list, there's a. Mark Anderson. He's a a, a flight testing guy, retired from the FAA, but he is very active in a, of a number of things.

Uh, let's see, Darrio, you'll hear me talk about Darrio in a minute. Dan de Mayo is one of our customers. In San Carlos, you saw the San Carlos flight school. The flight director was Alessandro. Dan runs the FBO there. Um, Mark Lucci runs, Mike Lucci runs the, uh, AOPA flight operation for in, in Frederick, Frederick, Maryland.

Um, I'm just looking for names that I recognize. Um, you know, there's just a bunch of people. They know us, we know them, and they're scattered all across the country, and they signed up to basically listen to our story, help understand it. Knock on doors or talk to pilots in their community to really help express how swift works in the marketplace.

Here's kind of a creative guy. Dario Costa is a aerobatic pilot, well known in Europe, and he's known because he flew a his own, uh, airplane, aerobatic airplane, very dramatic one. He works for vol Red Bull. Um, he flew it through a tunnel, a long tunnel, and uh, where was it in? I say it was in Turkey, but. It's simple. Yeah, it was in Turkey. It's right above his head and that long tunnel. So his airplane flew through the tunnel and you see the airplane there coming out the end of the tunnel right there. It's a really cool video. So look up Drio Costa and look up, uh, his flight under the tunnel. It's pretty exciting video.

Anyway, he's a spokesperson for us in Europe and a lot of people there seem to know him really well. And I mentioned that because we've also brought the fuel into Europe just recently. So there's a lot of. To understand the fuel market situation from a kind of a regulatory and an oversight perspective, uh, you have to understand the role of the FAA on the left.

Uh, and then the role of ASTM on the right and the role of EAGLE in the middle at the top. EAGLE was conceived in about 2022 as a coming together of FAA and industry, collaboratively, overall, and to some extent ASTM. So anyway, EAGLE formed years before that. There was something called, PAFI formed, was this alternative fuels initiative, I believe.

And that was also the coming together of FAA and industry. But it re morphed itself in 2022 when they formed EAGLE. And then the reauthorization bill, which came out in 2024, the FAA reauthorization bill. It added added language just to reinforce the role of EAGLE, which is to provide coordination across the industry and to monitor and had to conduct stakeholder communications on the transition of unleaded avgas, and the market was set in the reauthorization bill that the lead emissions would cease after December 31st of 20 of 2030. So from now until then is five years and 10 months or something like that, nine months, and the coordination is happening.

There are things going on regarding this whole deal, and you'll hear me talk about that. So the on the left, the role of the FAA primarily is certification. You heard me talking about STCs. There's one other company that has also has STCs, but then there's another thing called Fleet Wide Approval or Fleet Wide Authority or something like that. That's part of the EAGLE program, and they're

working on figuring out how certification from the FAA's gonna pass to the pilot in the airplane and whatever. So all that's happening on the left, on the right. ASTM is a, a body of, uh, it's called an industry consensus standard organization. And they come together to reuse specifications for things like fuels and lubricants and additives and things like that.

So that body has been in existence for decades. Every major fuel we use in the United States auto, gas, diesel, fuel, jet fuel, 100 low lead. Any, any kind of fuel that's used in the United States comes through an ASTM process. And so the, the roots are deep for longer than the FAA in the whole ASTM world.

And so there, uh, there's a lot to learn by working with those folks and we'll talk more about that. Uh, the bottom, the thing about rulemaking is, so when, when the reauthorization bill happened, uh, the FAA was charged through the, through Congress to establish a basis for how the lead emissions are gonna cease.

Are they gonna tell people, stop making leaded fuel, stop buying leaded fuel, stop selling at an airport. I mean, there's a lot of ways you can cut that. And so the FAA has been charged with the process by which figuring out how lead emissions are going to cease. And they, they do that in some form of rulemaking process, which is probably, if you ask me, it's probably gonna kick in in 20 26, 7, 8, in that kind of timeframe.

Rulemaking includes public comment and how they manage the awareness of campaign for the industry and so forth. So SWIFT is on a path to get our fuel in large, widespread use as fast as possible to get 2025, 2026, a lot of people aware so that when the rulemaking exercise hits, you'll see, you'll see how the communities will understand it and, and be able to deal with it.

And, uh, maybe we will see what happens then. Um, this chart looks a little choppy. So I mentioned the FAA reauthorization bill and the EAGLE transition and whatnot at the top in the center. And then below that is a body of executive level people. Uh, Kaitlyn Locke, Kurt Castana, James Viola, Darren Pleasant, Jack Pelton, and so James, James Viola, this guy, uh, you probably know him from the helicopter world. So he recently moved from vertical lift in or vercon into the GAMA organization just in the last two, three, or three weeks. Pete Bunce, who was previously in that role as. Sort of like on the side consulting, he's still there. He is a large presence in the industry and always has been. Uh, Chris, the current acting director, uh, the, a nominated new director of the FAA or the new administrative deputy's been named but not gone through the

process. So that could take a few days, weeks, or months. We'll see. So anyway, that's the organization kind of in, in motion as we know it today.

They all have an active role. They're all involved. And at this little chart at the bottom, it's a little hard to see or read, but the left hand side is kind of the industry side, uh, the manufacturer, the just transportation, and then the storage of fuel is typically handled through ASTM and related entities.

Get into fuel to the airport and then the, from the point that the fuel touches the wing of the aircraft and or you know, the fueling of the aircraft and further downstream of that. That's all typically under the role of the FAA in their certification process. That's from, that's from PAFI's own website.

So if or EAGLEs, you go to flyeagle.com. You flyeagle.org, sorry, flyeagle.org. You can learn more about that. So anyway, we talk to these folks all the time. Um, not all the time, but you know, often enough to stay current on transition to what we're doing. And they provide feedback. They write a lot of articles, keep the industry informed.

It's a challenge. It's, uh, a little bit unwieldy sometimes. But anyway, that's what's going on. So then what's new in terms of safety? I'm gonna talk briefly about each of these topics 'cause they're newsworthy and they're, they're irrelevant. Uh, Center for Environmental Health is a, is a, uh, environmental justice type of a firm in California that's been upset by a contract that was in place for the last 10 years, since 2014.

And they see that in their opinion as plaintiffs in a lawsuit over a contract. They see the desire to get. Uh, people that would otherwise want or want to use or need to use unleaded fuel. Everybody can use the unleaded fuel in such a way to kick out leaded fuel in some of these airports and some of these FBOs.

So there's been a controversy about that. Uh, you and these University of North Dakota, there's, there was an incident about 18 months ago. You might have heard, raise your hand if you heard about that. So some people ask me, so if I don't talk about it, they think I'm hiding something. I'm not hiding anything.

I'll talk about that. And then FAIB and SCRS will be self-explanatory in a minute. So center for environmental health. So there's a, I mentioned the lawsuit. There's a judgment that's underway. Uh, it hasn't finally happened yet, but the judge has spoken in his opinion so far about how to resolve, what does it mean to be for a fuel, for an un unleaded fuel to be approved for aviation.

What does that mean? And he's articulated this concern well, is that an FAA thing like an STC or is that a fleet wide approval, or is that an industry standard like ASTM or does it take OEMs to endorse? And you've heard me just talk about those words just minutes ago, about U 94. Ours has all those things and he's saying, wow, it's complicated with local and state and even federal regulations.

Why should a judge stand in the court and try to decide, uh, the opinion on a contract when all these regulations are in place to make everything safe? So he so far has. Sort of backed away from making any provocative legal decision because he's gonna say, let the, let all these things sort themselves out, and on the right, is it commercially available?

He's asking the question, well, is it stable? Is it commercially feasible? What's the, are there quality issues? Is it competitively priced? Does the airport jurisdiction applied to the tank? The FAA's jurisdiction, does it apply to the tank, et cetera. So he's got all these questions in his mind, and none of those have been, uh, clearly resolvable from the language that's in the contract that's under dispute.

So he's in a very, you know, challenging position to try to resolve this, given the construct of the contract that he's dealing with. And his inclination so far, and just give you what he said in the court, his inclination so far is to kind of back away from doing anything provocative. What does all that mean?

Why are we, why am I telling you this? Well, so the air, one of the airplane, one of the air ports in this particular case, Reed Hillview, there's another one. Watsonville introduced the fuel. It, it had problems in some aircraft, not all aircraft, but in some aircraft. And the aircraft owners wrote declarations of the problems they were having, and they introduced those into the court, into the public domain.

So these are the pictures, some of the pictures that were pulled out from some of those. And, and the other thing that happened is one of the damage, quote unquote, that was going on with those aircraft happened, uh, demand for the fuel that was used in this picture, it's Reed Hillview. This is public information.

So Reed Hillview used 2,800 gallons in November at the introduction of their fuel. Then it was a 1300 and it was 800. Then by February it was down to 200 gallons of fuel use in a three, in a four month period of time. So the demand fell sharply, presumably because the talk amongst the pilots that were using the fuel, were experiencing these problems and it created tension in the marketplace.

That tension is what I'm here to talk about. It's like how do you transition to new fuel? How do you handle when there's problems? This is an example, strictly an example. Well, during the time these four months of that fuel, the hundred octane fuel that was being introduced, uh, Swift Fuels was al was already flying UL 94 at this same airport we sold 86,000 gallons of 94 during a time when 5,000 gallons that you see on the sharp decline were going on for that, for that other fuel. So anyway, we've been sort of a constant force. The UL 94 presence at Reed Hillview in particular, there's four FBOs there. They've all been using UL 94 consistently for years with no reported damage.

There was one fuel introduced that had issues that were documented through the declarations to the court. It involved with, Cirrus, uh involved some Mooneys involved Cessnas. There was some issues around a Baron, a Beach, uh, let's see, a Baron and a Bonanza, but I don't have the details on that. And the Piper, there were three mechanics who also wrote declarations, and they were uniformly concerned about the fuel.

Anyway, there were words were in the public domain, so you just get the picture that there's, there's issues and challenges there.

Now I lost my, how do I advance the slide now? I've somehow lost it. I need my ever ready buddy. Can you advance the slide please?

That's too far.

So go to presentation. Okay. Yeah, you can advance it that way there. It's. Is that a presentation though? There you go. Now go forward one. So those slides that I just showed you were in relation to the CEH contract dispute.

I apologize folks,

If somebody. Has, um, triple A two triple A batteries. That would help.

Well, they are new, but, we'll, I'll work on that.

Sorry folks.

He's got batteries. Let's have a round of applause for this man outta his pocket like he did. There we go. Now let's move forward. This is about UL 94 at UND, university of North Dakota. So there was a, we can advance that. There was a conversation led by the dean of UND. This is him presenting last July at

Oshkosh where he got, there were about 200 people in the floor and he stood before everyone, he was explaining what happened to UND.

They flight school, they were flying, uh, according to their normal protocol, they fly at what's called peak EGT. So they, they talk, take off and climb at full ridge. And then they, when they get the cruise, they fly and what he described as peak EGT. And so they flew, uh, almost 400,000 gallons of fuel, 46,000 flight hours.

I just said they flew rich, the takeoff climb and also descent. They cruise, they flew peak EGT. Well, peak EGT is the highest temperature, uh, on the range. It's in the, it's in the range of best economy, but it's also the hottest operating temperature from an exhaust standpoint. And a lot of people that I've talked to around the country, they don't typically fly at peak EGT.

They might fly lean of peak under various conditions, or they might typically fly rich of peak. Particularly the flight schools where they're taught to, to fly. But peak EGT a particularly hot thing. I stood before rooms full of, of IA and, and, uh, a and p and IA type mechanics. And when I mentioned they flew this way for long periods of time, 400, 400 flight hours.

Most people cringe when they hear that 'cause it's. It's not necessarily normal. I mean it may be normal, but it's, most people that I've talked to, it seems that it's not normal. So anyway, um, we ran, the issue was one for Lycoming 'cause they're the one that type certificated the fuel on that engine and they've been doing a bunch of things.

Well, in the meantime, swift did our own work and we, we compared five fuels in that chart. We, on the left, from the left, it says low lead. We've compared low lead for 400 hours. In a, in a single instant, in a single cylinder instance. And we to try to measure and see if we could see valve seat recession. And we saw a little bit of valve seed recession.

You can tell by the bars after 50 and a hundred, 150 hours. And then we used our, our new 100R fuel with an additive. That's an anti valve seed recession additive, but we saw no recession whatsoever. And then our third fuel, which was UL 94, which was that UND, it, it experienced more valve recession than low lead did you see the bars? And then we, we weren't supposed to do, but we put our additive into U 94. And the, the fourth columns did not experience value recession, so we knew our additive worked. We knew before that it worked, but this proved that it worked. But, but 94 is not certificated with the additive, we're

working on getting 100R certificated with our new additive and, and it's the new fuel.

Lastly we did at UL 91, and it had the most of all in terms of valve recession. We were running it really hot temperatures for 400 hours, which was very, very stressful on any engine. But we wanted to get an indication of what happens and, and the thesis is some people said, oh, well that never has valve seat recession.

That's not true. It does have valve seat recession under certain operating conditions, depending upon what's going on. Now, in this case, 90, UL94 had a bit more, and that's the experience we think happened that at UND. So we encourage people on the firsthand, you know, you might want to rethink about flying at peak EGT if that's how you're flying.

'cause we have not had one other instance of people with our fuel having problems. 'cause most people don't fly at peak EGT. Okay, let's advance the slide.

Uh, so this is, uh, Darren Pleasant. He picked over from Mark Baker, AOPA. He came with a lot of enthusiasm trying to understand the premise here and understand what's going on, and he's, you know, he, he wrote a quote that's in AOPA's articles. He says, you know, yes, UND had an issue. It turns out they were flying at peak EGT.

And they experienced some valve seat recession issues and UL 94 is in use around the country for 10 years and no other flight schools have experienced any such problem 'cause they're not flying at peak EGT. Then he says our new 100R fuel is now in use in, California. It's got the valve seat recession additive. There are no indications of these problems anyway, everybody's positive about the future of 100R.

Let's go forward.

So regarding safety incidents, the FAA, just in the last, uh, two weeks, I would say, issued a memo saying, Hey. Like it was an SAIB safety, uh, airworthiness instruction or advisory. And it said, Hey, can people flying unleaded fuels have an issue, fill out a form and send it to somebody? I read that just like everybody did, thought well, that's just another thing from, from the FAA, but you know, there's already a reporting technique within the FAA call an SDRS safety, uh, defect reporting system. And I call it out here. 'cause that's another way you can talk to the FAA and document, document your, your issues or whatever. And

the thing is, on the right, the SDRS that goes into a central database, everybody can read and, and, and search.

And this on the left goes into an FAA thing that I'm not sure what happens with it then. So we're concerned about the future of that and we'll have to see what that, what, what happens there. Next slide. And that's all, all. That I just said is regarding safety related matters in the time and spirit of unleaded fuels.

Here they come. So I've talked about UL 94 being our, our fuel for the last 10 years. It's a 94 motor octane fuel for 75% of the fleet, and now here comes 100R, which is a 100 motor octane fuel. The same weight, same vapor pressure, same supercharged rating. It's the global replacement for one for low lead.

It's a hydrocarbon fuel with oxygenates blended into it, and it's got a valve seat recession additive, and we're going to sell rights to use that fuel the same way we've sold 'em all along, but $100 STC. If you bought a 94 STC, you get the a hundred for free. If you don't have a 94 STC and you wanna buy this to see, now you can buy it for a hundred dollars and it'll be good forever.

Okay? Any future modifications from our certification, any of that sort of thing that might occur in the future, that'll all come for free. But once you've bought the first a hundred dollars deal. That's how it works. Okay. These advance, it's easier with the hand device. Uh, the 100R comes with a, a placard arrangement today, and it also comes with an engine tag, so you can apply that to your engine and know that your particular, your whole configuration is set up and ready to go.

Next slide.

So the way we run our certification program, I call it, I call out best practices. So there's a minimum set of things you can do if you follow the FARs, the federal aviation regulations that are approved by Congress. For the most part, in, in the language that you find in the FAR, uh, and, and they're, again, there's, they're expressing more or less a minimum requirement, and we've extended that to include best practices.

We've talked to the program. In some cases, they've gone beyond the minimums. We've talked to the OEMs. In some cases, they'll encourage us, like Continental, whoever. They'll encourage us to go above and beyond. They're concerned about their TBO, they're concerned about their warranties. So sometimes they ask us to do things above and beyond the minimums, so we have a basis to, to help them approve those kinds of things.

So we're really collecting advice and comment and input from a lot of different people collaboratively as we, as we build our, our program here. And then by, by the time we get to the end of our certification, we feel it's, we've empowered it to become OEM endorsed and FAA or PAFI enhanced whatever in order to try to get our certification to be rock solid.

That's how we operate, we do it as collaboratively as we can do it in the spirit of confidentiality and proprietary whatever, what we're working with top experts in each dimension of our work. And that's how we proceed forward.

So here's an example. This is a, uh, Lycoming IO 360 L2A engine. It is in a test cell at Purdue University. Was about three miles from my office. Uh, we were allowed to configure the engine there. We bought it from li from, uh, Lycoming. Uh, we ran what's traditionally a minimum 150 hour endurance test. 14 CFR 33 49 is 150 hour test.

We ran it for over three, over 350 hours. We extended the minimum run of 150 with additional 200 hours of what's called flight duty cycle. And by the time we were done, it was 407 hours of running. Okay. Uh, Thomas Alza is the senior, uh, engineer there. He's a pilot, he's a PhD chemist, and he's helped build a design along with the team, all the configurations and monitors and things.

Next slide. And you can see it, it is set up with a video tape. So we have real time videos, streaming video for all 350 plus hours. We have digital, uh, data feeds for every, for every second of data. So we're, in this case, it's running at about 2,700 RPM. Uh, right now it's running close to five 30 degrees Fahrenheit on the seat on the four CHTs, and the EGTs are running at about 1400 or so, maybe just below that full throttle, full rich mixture.

I mean, it's, it's tracking everything there is to track relative to the operation of the engine over the life of that test. And, and the goal was to not just test it for 150, the additional 200 hours flight duty cycle was all at peak EGT. Not all, but largely at peak EGT cycle. We ran 89 cycles at peak EGT that included 15 minute, uh, oil drains and whatnot because we're trying to exercise the engine, let it cool, let it, if it's going to deposit or create problems from the, from the hot to cold, the hot to cold, the hot to cold, you wanna see all those kind of problems emerge from your test. Next slide. So we did all that and then we tore down the engine here is, the test itself, 150 hours in specified intervals. I mentioned that it's in some cases dictated by the FAR, in this case it is. And then the 200 hour test, we built the 89 cycles. And then they were operating in calibration and vibration tests before we did the tear down. Next one. So when we did the tear down, we worked with, uh, GNN aircraft.

They tore the engine apart to remeasure. There was a pre-measurement and a post test measurement. And the post-test measurement was to validate where were the wear parts, how, how did they wear? And the answer is they wore very little and which is great news. And so it was a testament for our any valve seat recession additive.

This is the valve head, the valve configuration that you see inside the engine for the exhaust valve. Next slide, uh, intake and exhaust. They, they held compression. They, they did not allow for leakage after 407 hours, which is. You know, really high temperature, a lot of metal moving on, metal kind of thing, and we, the compression was in really great shape after 400 hours.

Next slide. Spark plugs were virtually clean. We didn't surface them in the 400 hour interval. We did remove them and weigh them and put them back into their original position without rotation because we wanted to see how much buildup there was. There was no issue with the gap or any deposits that formed in such a way to compromise the sparking of the, of the plug.

So it was a perfectly, a good outcome. Last slide, your next slide. I'm sorry. This is, uh, Dennis Wyman. He's a lot at a lot of air shows. I'm not sure if he's at Sun and Fun, but he's the one that managed to tear down and reported the results. His comment, he spoke at Oshkosh last July. He stood on the stage and said, you know, the majority of the parts, the wearable parts were in new service limits, new service levels, new service limits, which means that it was as if they were new after 470 hours of high stress testing.

So that's a pretty strong endorsement for the results of the test, and we attribute that to the valve seat recession additive this is a letter that was signed by Lycoming endorsing our detonation test program. It was also issued by Lycoming or through us from Lycoming, uh, in, in our ASTM, uh, specification work. And that's still ongoing today. So anyway, they've approved, so that's part of our building endorsements from the OEMs as we go.

You heard me talk about that earlier. This is how we know the OEMs are gonna back us when it comes time to, uh, seek various forms of, uh, certification in the program. Okay, thanks. Uh, then we moved into flight testing. So we arranged for a 172S aircraft. On the left is Pete Raus. On the right is John Foster. In the center is Josh Palmer. He's a pilot that works on our staff, and they, uh, basically took an airplane through in-flight restarts and fuel starvation, cold and hot climb, mock landing.

They did all those types of things on low lead. They did all those things on. On Swift's 100R. You, you know, over a three to four or five day period. And, uh, next slide. And then we plotted out the results of that. They were all managed, you know, normalized the data 'cause there are different weather conditions and things that happened.

And so this shows the red dot, the rated climb for 100R was at least as good as low lead. It actually catches up and almost matches low lead at the end of 10 or 15 minutes, you see there. Next slide again the rate of climb showed excellent performance compared to low lead. Next slide, same thing. The red dots on the right were superior actually to the ones with the low lead on the left. Next slide. And we got alternating things going on. All that's looked at under, not a microscope, but under with a lot of scrutiny from the flight test program people of the FAA. Next slide. So we hired a guy who's, who's on my, uh, ambassador slide.

So Mark, Mark Anderson is a retired Air, air, uh. Air Major General in the Air Force, sorry. And he did an excellent job of making sure that all the data was in proper form when we presented it to the FAA and, uh, he, he went through a lot of machinations with Dave to make sure it was exactly right. So we had a lot of care and attention given to this.

Uh, we didn't just sort of like put a bunch of paper on it and say it's good. No, we had a lot of technical scrutiny from guys that really know this stuff very well, and that's how we got our 100R approved. Next slide. So this is a picture, a snapshot of a complex chart from ASTM International. Uh.

It's meant to be complicated just to illustrate the fact that there's a bunch of different chunks of things that are evaluated. Starting at the bottom in red, it says, FAA, a and you'll notice it says, uh, engine test, flight test. I've just shown you all our pictures on engine test and flight test. So the FAA quadrant of this chart is largely managed by the FAA with FAA, performing engine tests and flight tests and things like that.

Then you jump to the top in white where it says basic specification properties, motor octane number as an example. The motor octane number test is called D2700, and it's been. You how you run. That test is described by ASTM test method D2700. And the same for supercharge. There's a D909 test method.

All of these tests and test methods are orchestrated and managed by ASTM International and the people that participate in ASTM International. So you go through all these different types of tests and then there's a paragraph for fit, for

purpose, and it seems like. Uh, vapor pressure and viscosity and water, uh, solubility.

And over there on the right, it's a continuation, carb icing, uh, surface tension, thermal conductivity, dielectric, constant gums, potential gums. Um. Water reaction, microbial contamination, electrical conductivity, you have all of those generally have an ASTM test method associated with them. And you have to compile all your technical results for your fuel.

And that takes a long time to get all that proper and make sure it's in front of ASTM. 'cause there's a lot of people to review and challenge this information anyway, that's what you do. And then you get to the green part. And I used the word, I wrote the letters. MTAC. MTAC stands for a material technical advisory committee.

Uh, it's, there's actually a whole set of things, uh, that are not necessarily MTAC, but they're part of D7826. This is a spec called D7826, part of ASTM. So if you turn the next page, it's all about the green on the next page. So there's a, a section for metals and there's a section for non metal.

So the metals are pretty straightforward. These are all provided by the, uh, engine and airframe OEMs. They say, oh, we use this type of metal and this type of metal and this type of metal. So ASTM collects the understanding from the OEMs about which types of metals need to be tested, and then separately, another chunk of things for all the non-metals.

And this thing has. You know, buna and, you know, elastomeric type materials. It's got o-rings, sealants, uh, bladders, et cetera, et cetera. It's a long, long, long, long list, and it's an ever changing list. They're, they're always coming out with new things they want to make sure get tested. So flip to the next page.

So we, we did a comprehensive set of metals testing, and their results were presented to ASTM Next page. We did a variety of different types of non-metals testing, and these are done typically by, uh, third party technical firms, technical, uh, compatibility, testing firms of all different sorts. So if you want to do a, uh, an o ring or a gasket or a paint or a whatever you typically, or whatever you, you work with a third party that's experts in that, composites, for example.

You work with them and they put together a program, you hand them the, the structure, the test methods that are prescribed by ASTM. They follow that method and they issue the results. And then they say, here this, okay, next one.

This was paint. So we had a, a paint process we went through for drips and then we saw where we saw a marking, for example, and then we wiped it away. That went clear. So we could say, oh, it didn't stain. It just, it had a low lead, had a drip, but it didn't stain, you know, that kind of thing. So we went through that process next, and we did the same kind of thing. We did testing for fuel bladders.

These are polyurethane, uh, fuel bladders. Next we did tank sealants of all different types. Next. Uh, and then the, this is maybe difficult to understand, but the, the, the spec that I showed you was D7826. They have a list of things on their spec, and then MTAC, which the FAA don that name, uh, in, back in 2022 was a subset.

They were focused on bladders, uh, o-rings and bladders, sealants and hoses. But we still had to do the full 7826 list. And then in in the May of last year, may of 2024, the OEMs came back with a refreshed list, additional items on their list, which is under the MTP, material test plan 002. Those have all been added.

So SWIFT has done all of these. SWIFT has done all these. We've got 1, 2, 3 that are still in process, but all these other ones have already been done by Swift here in 2025. So as the list changes and new things come about, we uh, we make sure to stay current with all that and communicate with the OEMs next.

So who is ASTM? ASTM is a volunteer group of people. This is Swift's, ASTM task force. Uh, the red dots are. Generally oil and gas companies. So if you look at 'em carefully, it would be Exxon, BP, Chevron, Phillips Lyondell, Marathon, Nesty. Some of them are international companies like, like, uh, Sinopec is China.

Uh, there's others Valero San Antonio, Air BP, they're in in Europe. I mean, it's the red dots are all the oil and gas experts and who they send to this meeting are the avgas experts from their. From their industry. Okay. They, they're the ones from their company that come to these meetings. The green dots are OEMs, so you see Continental Motors, Boeing, uh, Lycoming engines, Drummond, uh, GAMA, which represents all the engine and air freight OEMs.

Uh, Robinson Helicopter, Rolls Royce, Rotax, United Airlines, Benz. There's, you know, all the OEMs send their avgas folks. And then what's left are a variety, a mishmash of US air Force, US Navy, um, air Force Research Lab. You know, it, it's a, it's a lot of people with a lot of sophisticated knowledge about aviation fuels and avgas in particular, and they come together to review and critique the results that come from all these ASTM methods that you saw in

that my big long checklist, they review it, they vet it, they say, well, you did this over here and you did that over there. Why didn't you do this other thing? Or, why don't these two numbers match? Or, you know, it's a, it's a challenge process.

It's a very intense one and we've been through it before. We, we've done two production specs before. We're in the midst of the final round of one more production spec for 100R and that's going on now. Next slide. So all this data that was on that big long white chart, including the MTAC and the FAA, we, we turned all that data, the standards, the specs, the engine test that you saw, pictures of the flight test you saw pictures of all of that data we gave to the FAA certification office. All that data we gave to ASTM International. Okay? So it's under parallel review by different agencies to get it all done next. And in September, the FAA issued. The initial approval of 100R, which was for the, as Cessna 172 R and S, that came out in September.

And we began working with airports that were interested in using that. And, and we've done that and you heard me talk about that in early in the talk. And then ASTM. The balloting process has been ongoing for several, uh, several months now, and we're in what we believe are the final stages of that, and we'll get to that soon.

Next. In the meantime, we've transitioned away from the L uh, L2A set of things, the UL 94 footprint. Now we're moving into the turbocharge world. So we've set up a TSIO550K turbocharge engine. Uh, this is set up in the same test cell we had before. We've reconfigured our engine design, our engine monitoring system for the, now we have the six cylinder instead of the four cylinder.

It's all set up to ready to go. We're working with that way to get that all finalized and that's underway. So next slide.

Uh, so what's gonna happen, the first thing that's gonna happen is 100R's gonna step into the footprint of 94, and when we do that, we'll have 75% of the US fleet able to fly on 100R. The second thing that's gonna happen is the turbocharge endurance test is gonna open the door to a lot of turbocharged engines becoming approved soon from now, sometime this year.

And when that happens, it'll add a big chunk to the turbocharge, a portion of the turbocharge chunk to our engine results. And then also what will happen sometime this year is we'll get a production specification happening from

ASTM. So 2025 is a big year for these three things to happen. We're confident they're gonna happen, and we're excited about the future of 100R.

Next, we believe the way the market works is really only room for one unleaded fuel. We think that one unleaded fuel will be 100R. We thought that all along. We continue to think that. Next. So what you'll see coming soon is our engine results, our engine, uh, certification coming from STCs for, for a swath of hundreds and hundreds of engines, hundreds and hundreds of airframes.

And then following on that will be rotorcraft. Those might be type certificated, they might be STC, we'll see. And then our fuel specification that you've heard me describe, that's gonna happen from ASTM. All those are gonna happen within the next several months. Next. So we got five years and eight months, almost nine months to go.

We're sure we're gonna make the deadlines and we're gonna be largely with our fuel in the market before the public rulemaking starts to have an effect. And we think that will become the vacuum through which our fuel will become the, the, the winning ticket for the world next. So you've heard me describe the transitions underway, the relation between FAA and ASTM.

Our intent to have our fuel replace low lead everywhere, commercially viable, global with the *any GSR ahead of it*. That's what I came to talk about. And then you have, uh, five minutes for questions. See if the boys, thanks for your attention during all the thank you audio.

[00:44:43] **Speaker B:** Anybody have a question? I'll come by with the mic. Yes, sir.

[00:44:49] **Question:** Um, when you say nationwide in 2025, what's the definition of nationwide?

[00:44:54] **Chris D'Acosta:** I didn't say nationwide in 2025, I said, well, what that means is if you look at our map, what I showed you earlier we'll be in various geographies across the country, different communities, different attitudes, different climates and altitudes.

It won't be in every airport in 2025, but it will be dispersed much to basically everywhere you saw a 94 dot will become a 100R dot first, and then from there we'll expand out and that's what the ambassadors are helping, helping us do.

[00:45:25] **Speaker B:** Anybody else? Question what rate here?

[00:45:32] **Question:** How do you expect pricing to, uh, compare to, um, 100 low lead?

[00:45:37] **Chris D'Acosta:** Um. Well, it's gonna be, there's several ways to answer that question. First off, low lead is volatile in the market that we're in. So oil prices do like this. avgas prices have a similar volatility, and avgas is generally priced higher than auto gas at a gas pump, you know, 'cause it's a more premium fuel and it's harder to get it into an airport.

So we will, people will tend to follow the same traditional, uh, volatility range as before. Um, there's gonna, it's gonna fluctuate for a variety of market understandable reasons. When we're small, it costs a little bit more to distribute. When we grow bigger, bigger, bigger, some of that inefficiency will sort itself out and the prices will come down.

You know what I'm saying? So scale helps. Keep the cost low and when we're in a non-scale mode, it's sometimes a little bit more expensive. So that's just the natural part of the introduction of a new fuel. Um, and then as low lead diminishes in time, what happens to low lead's price. If it, if it becomes more scarce, what happens to low lead?

Generally when things become scarce, prices go up. But if it's offset by the introduction of our fuels that are hopefully becoming more stable, you'll see low lead rise and our fuel fall. I mean, there's gonna be some sort of a transition period like that. Volatility in oil markets is not gonna change, but the 20, 30 year look forward.

So if you heard my resume, I've been in this business for 45 years. Okay, so when I was, uh, graduating, when I was a senior in college, uh, some guy stood in front of a two, a group bigger than this, and said, oil's gonna be gone in 10 or 15 years. It was like an AOC comment, you know, it's like oil's going away there's not enough of it to last. Well, that if that were true, that would've stopped, you know? 30 years ago for some reason, we still have a whole lot of oil. We're gonna continue to have a whole lot of oil. It's, we have a whole lot of oil and so I'm not worried about anything from the standpoint of my children and their children's future relative, the fuels related market.

No matter what happens with electricity and all those other kind of things

[00:47:51] **Question:** In a year, I've had two tanks of my fuel pump that billed roughly the same amount. What's percentage, like, it sounds like more expensive. Is the hundred R vs hundred low lead in your

[00:48:05] **Chris D'Acosta:** I said it's compatible, commercially viable.

I, I think it'll be a few cents more maybe. But I mean, it's not gonna be dramatically more if you, if you don't, if you're not sure the range you buy now, we'll give you a quote and you'll know what it is. So here's the thing, when somebody calls me and they're, they say, I'm in, you know, I'm in some far away place and I want 500 gallons.

Well, my fuel, where we make it is as a cost. But if you wanted to transport it in a small quantity to a 500 gallon tank, you're gonna pay an arm and a leg to get it. If you have a 10,000 gallon tank and it's an 8,000 gallon truckload, that's about as efficient as we can make it, depending upon how far away that you are.

So we, we try to find the most logistically convenient place. So I started to talk by telling you all these companies and customers that are eager and aggressively trying to buy the fuel, and that's, that's happening. That's happening now. And somehow the market is finding a way to justify. What it takes for us to get it to them.

And we're always looking for ways to make it cheaper.

[00:49:05] **Speaker B:** Okay. Good question. Good discussion. Thank you Chris. Anyone else have a question?

[00:49:12] **Chris D'Acosta:** Thank y'all for your time. I appreciate it.

[00:49:13] **Speaker B:** Thank you so much. And just one, one time announcement. Anyone who did not get a form, see the volunteers in the back. Uh, to get AMT credit, so thank you again.