

WEBVTT

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00:00:00.475 --> 00:00:03.405

Next pre presenter is, uh, Scott Glaser.

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00:00:03.545 --> 00:00:07.845

He holds a PhD in biomedical engineering from Drexel,

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00:00:07.905 --> 00:00:11.325

as well as a Bs and MS in aerospace engineering.

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00:00:12.275 --> 00:00:16.545

He has, uh, been involved with both airplanes

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00:00:16.545 --> 00:00:19.145

and spacecraft, and, uh,

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00:00:19.925 --> 00:00:23.865

he currently ma oversees a, uh, a fleet of 44 aircraft

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00:00:23.895 --> 00:00:28.665

with 22 types that also, that, uh, run the full gamut

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00:00:28.665 --> 00:00:31.425

of flight training, uh, to flight testing.

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00:00:32.525 --> 00:00:35.305

So, without further ado, I'd like to, uh,

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00:00:35.975 --> 00:00:38.905

introduce his paper, which is titled Safety

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00:00:38.925 --> 00:00:41.505

and Civilian Contract Flight Test Organizations.

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00:00:44.855 --> 00:00:45.855

Scott?

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00:00:47.655 --> 00:00:49.995

Yep. Taking, uh, taking control here.

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00:00:52.295 --> 00:00:56.595

Uh, see, here we go.

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00:00:57.645 --> 00:01:00.715

There we go. All right.

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00:01:00.795 --> 00:01:03.755

Well, uh, it's great to talk to everybody today.

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00:01:03.755 --> 00:01:06.595

Thank you so much for, uh, giving us the opportunity to, uh,

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00:01:06.595 --> 00:01:08.995

to brief on something near and dear to our heart.

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00:01:08.995 --> 00:01:12.715

Excuse me one second. Flying airplanes is, you know,

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00:01:12.715 --> 00:01:14.835

you think after a year of pandemic, we can get used

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00:01:14.835 --> 00:01:16.435

to this stuff, but here we are.

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00:01:17.335 --> 00:01:20.315

Um, thank you again, everybody for, uh, for the opportunity

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00:01:20.315 --> 00:01:22.435

to speak to you today on a topic that's neared

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00:01:22.435 --> 00:01:23.475

and dear to our heart safety

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00:01:23.535 --> 00:01:25.115

and civilian contract flight test.

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00:01:25.855 --> 00:01:29.315

Um, so this briefing, just to give you a little, uh,

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00:01:29.405 --> 00:01:31.555

background, this briefing came out of, uh,

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00:01:31.555 --> 00:01:33.595

suggestion based on a lot of questions we get in

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00:01:33.615 --> 00:01:36.915

how our company flight research, uh, in, in Mojave,

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00:01:36.915 --> 00:01:41.835

California, uh, operates to support our customers, um, as a,

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00:01:41.935 --> 00:01:44.435

as a, as a professional flight test organization, that

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00:01:44.435 --> 00:01:47.635

that is not, you know, military or OEM based.

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00:01:48.175 --> 00:01:51.915

Um, so, so that's kinda the overall, um, the purpose

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00:01:51.935 --> 00:01:53.435

of this brief is to answer that question

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00:01:53.435 --> 00:01:54.515

that we get asked a lot.

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00:01:55.175 --> 00:01:57.515

So, to start that off, I'm just gonna talk about, uh,

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00:01:58.135 --> 00:02:00.355

do some, uh, intro stuff, uh,

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00:02:00.355 --> 00:02:03.595

talk about our aircraft personnel, uh, organizations, uh,

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00:02:03.785 --> 00:02:05.115

like ours, operations,

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00:02:05.115 --> 00:02:07.835

and then, uh, take any questions, uh, there at the end.

41  
00:02:08.535 --> 00:02:13.515  
Um, uh,

42  
00:02:14.275 --> 00:02:16.555  
I got a, I got a question already about the recent

43  
00:02:16.555 --> 00:02:17.875  
3 26 accident.

44  
00:02:18.135 --> 00:02:20.155  
Uh, I, I can, I can't say much about that.

45  
00:02:20.295 --> 00:02:22.435  
Uh, I can, uh, I'll talk, I'll tell you

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00:02:22.435 --> 00:02:24.555  
what I can when we get to the question section, um,

47  
00:02:24.575 --> 00:02:26.075  
but, uh, we'll get to that here in a second.

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00:02:27.095 --> 00:02:28.955  
Uh, so our company is, uh,

49  
00:02:29.235 --> 00:02:30.595  
companies our Flight Research Inc.

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00:02:30.775 --> 00:02:32.955  
And, uh, the International Flight Test Institute.

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00:02:33.055 --> 00:02:36.235  
We provide, uh, flight test support, uh, to a number

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00:02:36.235 --> 00:02:37.795  
of customers, defense and civil.

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00:02:37.815 --> 00:02:39.835  
We do, uh, upset recognition and recovery training.

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00:02:39.855 --> 00:02:41.875

We provide that for Flight Safety International.

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00:02:42.415 --> 00:02:44.395

Uh, we do flight test training, space flight training,

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00:02:44.395 --> 00:02:45.435

aerospace research.

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00:02:45.775 --> 00:02:48.035

We are also a, uh, a repair station.

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00:02:48.055 --> 00:02:49.995

So we have our own maintenance department as well.

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00:02:50.695 --> 00:02:52.835

And, and I'm introducing the company to kind

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00:02:52.835 --> 00:02:54.795

of give you guys background, not so much as a sales pitch,

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00:02:54.955 --> 00:02:56.275

although the marketing people were very happy

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00:02:56.275 --> 00:02:57.315

with this part of the brief.

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00:02:57.815 --> 00:02:59.925

Um, but this is, this is what we do.

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00:03:01.025 --> 00:03:04.165

And some of our folks, our CEO is Bill Corner.

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00:03:04.175 --> 00:03:05.565

We're very fortunate to have him.

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00:03:05.585 --> 00:03:08.605

He was a Vietnam helicopter pilot, uh, that went on to, uh,

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00:03:08.605 --> 00:03:10.805

retire from the Air Force and then became a very successful

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00:03:11.005 --> 00:03:14.285  
businessman as a really unique background that allows him

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00:03:14.305 --> 00:03:16.805  
to understand the needs of the company as well

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00:03:16.825 --> 00:03:19.605  
as administer it like a, like a company should be.

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00:03:20.105 --> 00:03:21.325  
Uh, that's me in the center there.

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00:03:21.465 --> 00:03:24.005  
Uh, and then some of our other, uh, cadre,

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00:03:24.215 --> 00:03:26.485  
Billy o Mike Young, you guys might know those guys.

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00:03:26.545 --> 00:03:28.645  
And, uh, mark s scarf amongst, uh, many others.

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00:03:29.545 --> 00:03:31.365  
Our staff, uh, in-house has experience

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00:03:31.365 --> 00:03:33.405  
with all number different types of airplanes.

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00:03:33.405 --> 00:03:34.685  
And I know everybody on this, uh,

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00:03:34.685 --> 00:03:36.405  
call has similar experience.

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00:03:36.785 --> 00:03:39.245  
Uh, but again, giving you an idea of the background

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00:03:39.245 --> 00:03:41.605  
of organizations like ours, what, what the background

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00:03:41.605 --> 00:03:43.645

of these folks are and how how rich it can be

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00:03:44.615 --> 00:03:45.965

facilities have to exist.

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00:03:46.185 --> 00:03:48.205

Our facilities, we have our own control room.

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00:03:48.225 --> 00:03:49.885

We have a large campus, uh, that we share

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00:03:49.885 --> 00:03:51.205

with national test pilot school as well.

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00:03:51.745 --> 00:03:56.565

And, uh, the airspace is, is a huge, um, uh,

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00:03:56.565 --> 00:03:58.925

benefit of ours where we operate in, uh,

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00:03:59.245 --> 00:04:01.565

restricted area 25 0 8 out there at Edwards, working

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00:04:01.565 --> 00:04:02.685

with the Edwards personnel.

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00:04:03.025 --> 00:04:05.005

We have letters of authorization to do that,

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00:04:05.945 --> 00:04:08.885

and any, any contract flight test organization has to have

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00:04:09.075 --> 00:04:10.965

that sort of resource, whether it's 25 0 8

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00:04:11.025 --> 00:04:12.605

or over water ranges

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00:04:12.605 --> 00:04:15.085

or some sort of range that they can use

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00:04:15.105 --> 00:04:16.325  
to execute the flight test.

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00:04:16.745 --> 00:04:19.765  
Uh, and then the facilities, of course, uh, to support that.

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00:04:21.265 --> 00:04:22.845  
Our fleet, I love this slide, just

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00:04:22.965 --> 00:04:24.045  
'cause it's lots of pretty airplanes, and

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00:04:24.045 --> 00:04:25.125  
that's what we all like, right?

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00:04:25.545 --> 00:04:27.805  
Uh, like you said, we, uh, we support a fleet

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00:04:27.805 --> 00:04:29.645  
of 40 plus aircraft, 22 different types,

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00:04:30.065 --> 00:04:31.245  
and we get that question a lot.

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00:04:31.345 --> 00:04:33.885  
How do you, how do you support that many different types

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00:04:33.885 --> 00:04:37.325  
of airplanes, maintenance and, and, uh, air crew training

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00:04:37.385 --> 00:04:38.605  
and things along those lines.

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00:04:38.625 --> 00:04:40.845  
And, and I'll get into that into some more detail.

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00:04:40.845 --> 00:04:43.365  
Again, this is just sort of an overview here in a second.

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00:04:44.905 --> 00:04:46.045



So that's our place just to give it,

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00:04:46.045 --> 00:04:47.165

give you some background, excuse me,

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00:04:49.355 --> 00:04:51.405

getting into the, the, the topic.

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00:04:51.585 --> 00:04:53.285

So, civil contract flight test.

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00:04:53.515 --> 00:04:55.965

This is really a unique capability that we're very proud of.

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00:04:56.985 --> 00:04:59.525

And what, I mean, whenever I say civil contract flight test.

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00:04:59.525 --> 00:05:02.565

So let's say somebody needs to test an airplane or a widget

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00:05:02.565 --> 00:05:04.965

or whatever, they don't either have the capabilities

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00:05:04.965 --> 00:05:07.165

that their com company or, or their organization

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00:05:07.165 --> 00:05:08.565

or their organization is full up

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00:05:08.565 --> 00:05:09.845

and they need some kind of support

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00:05:09.865 --> 00:05:11.805

or some sort of specialization and stuff like that.

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00:05:11.805 --> 00:05:15.045

Where do they go? Uh, well, they go to companies like ours,

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00:05:15.185 --> 00:05:16.405

uh, in flight research.

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00:05:16.405 --> 00:05:18.085

There are a number of other, other companies out there

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00:05:18.085 --> 00:05:20.445

that do different levels of this flight test.

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00:05:20.945 --> 00:05:23.885

And, um, and the, the services

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00:05:23.885 --> 00:05:26.085

that we all provide are very unique

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00:05:26.185 --> 00:05:28.845

and specialized, excuse me.

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00:05:28.845 --> 00:05:31.405

However, we all all tend to be very flexible, uh,

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00:05:31.405 --> 00:05:33.245

because we tend to be smaller companies.

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00:05:34.105 --> 00:05:36.645

So we can do more, uh, creative things, if you will.

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00:05:36.915 --> 00:05:39.325

However, safety across the board is

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00:05:39.325 --> 00:05:41.445

paramount, and that can be the bigger challenge.

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00:05:41.605 --> 00:05:45.005

'cause we're doing things that are, shall we say, creative,

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00:05:45.115 --> 00:05:48.365

like I said, uh, before that are off nominal.

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00:05:48.505 --> 00:05:52.085

So our safety process has to be more robust than a, than a,

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00:05:52.165 --> 00:05:53.725

a standard operating, uh,

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00:05:53.725 --> 00:05:56.285

organization like a aircraft charter or something like that.

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00:05:56.305 --> 00:05:59.125

It has to be significantly different and more robust.

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00:05:59.345 --> 00:06:02.205

Um, and we'll go over some of that again in, in a moment.

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00:06:02.545 --> 00:06:03.845

And I'll tell you, at our facility,

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00:06:04.025 --> 00:06:06.765

we require very heavily on good people, people

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00:06:06.765 --> 00:06:09.765

that have been there that, uh, have experience

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00:06:09.765 --> 00:06:11.725

with flight tests, operations, things like that.

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00:06:11.725 --> 00:06:14.645

Safety systems that know what to look for.

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00:06:14.825 --> 00:06:16.085

So we have our processes

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00:06:16.085 --> 00:06:17.885

and our policies as tools, as our,

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00:06:17.945 --> 00:06:19.365

our last presenter talked about.

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00:06:19.945 --> 00:06:23.085

Uh, but we also rely very heavily on expertise of,

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00:06:23.105 --> 00:06:24.245

of those that have been there.

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00:06:27.345 --> 00:06:29.565

So when we talk about flight tests, what kind

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00:06:29.565 --> 00:06:30.925

of stuff goes on in these organizations?

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00:06:31.185 --> 00:06:33.645

So we do, in our organization, uh,

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00:06:33.645 --> 00:06:35.525

we do everything from component flight

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00:06:35.525 --> 00:06:38.525

to somebody has a widget or a box or a seatbelt or whatever,

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00:06:38.945 --> 00:06:40.845

and they want to test it on a vehicle,

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00:06:40.845 --> 00:06:42.685

whether it's their vehicle or our vehicle

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00:06:42.825 --> 00:06:44.685

or somewhere, some combination in between.

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00:06:44.995 --> 00:06:47.125

They bring it to us, we talk to them about

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00:06:47.125 --> 00:06:49.085

how we're gonna execute it, and, uh,

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00:06:49.145 --> 00:06:51.685

and we, we execute per their, or how we would execute it.

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00:06:51.685 --> 00:06:53.725

We execute for their requirements, uh,

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00:06:53.745 --> 00:06:55.285

and then we give them the data

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00:06:55.425 --> 00:06:57.165

or whatever process they're looking for.

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00:06:57.705 --> 00:07:00.045

The question then becomes, what are their test objectives?

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00:07:00.465 --> 00:07:02.045

And that can run the gamut.

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00:07:02.115 --> 00:07:04.445

It's, it's really interesting, all the different, uh,

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00:07:04.615 --> 00:07:08.045

objectives that we've been asked to, uh, asked to complete.

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00:07:08.275 --> 00:07:09.885

Some of it is simple certification.

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00:07:09.945 --> 00:07:14.045

So a, uh, manufacturer of something, whether it's an STC

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00:07:14.045 --> 00:07:16.885

or whatever comes to us and they want to have this new, uh,

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00:07:16.885 --> 00:07:19.445

modification certified per the FAA

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00:07:19.745 --> 00:07:21.045

or YASA or something like that.

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00:07:21.545 --> 00:07:24.325

We can, we have DERs on staff that can do those sorts

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00:07:24.325 --> 00:07:25.525

of things and execute.

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00:07:25.795 --> 00:07:30.085

Sometimes, uh, organizations just want to build some sort

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00:07:30.085 --> 00:07:32.005

of one-off to, you know, some sort

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00:07:32.005 --> 00:07:33.965

of conceptual design or something like that.

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00:07:34.265 --> 00:07:35.445

And that's a different story, right?

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00:07:35.675 --> 00:07:36.685

Does it, does it need

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00:07:36.685 --> 00:07:39.005

to pass all the certification requirements for STC?

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00:07:39.325 --> 00:07:41.045

Absolutely not. But does it need

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00:07:41.045 --> 00:07:43.925

to meet the safety requirements of our company

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00:07:43.925 --> 00:07:45.205

and of their companies to make sure

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00:07:45.205 --> 00:07:46.525

that everybody comes home at night,

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00:07:46.555 --> 00:07:48.805

even though we're only gonna fly this thing, whatever,

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00:07:48.805 --> 00:07:51.405

five times, 10 times, 20 times, whatever.

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00:07:51.405 --> 00:07:53.285

And that's on us. And those are, frankly, some

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00:07:53.285 --> 00:07:54.405

of the more challenging safety

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00:07:54.725 --> 00:07:55.885

questions, uh, that we come across.

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00:07:56.425 --> 00:07:57.725

And then of course, there's RD which

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00:07:57.725 --> 00:07:58.885

kind of falls under that as well.

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00:07:59.205 --> 00:08:01.205

Research and development. Somebody's got a new idea,

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00:08:01.395 --> 00:08:03.285

something like that, that they want either us

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00:08:03.285 --> 00:08:05.805

to test on our airframes or on their frames,

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00:08:05.805 --> 00:08:07.125

and they need our expertise.

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00:08:11.335 --> 00:08:15.355

So just to, to, to, um, hit the,

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00:08:15.415 --> 00:08:17.315

the obvious topics out of the gate.

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00:08:17.375 --> 00:08:18.835

And when we're talking about safety.

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00:08:19.375 --> 00:08:21.515

So when you go to any of these organizations, ours included,

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00:08:21.535 --> 00:08:23.035

you should see all the stuff you're used

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00:08:23.035 --> 00:08:24.475

to seeing at the bigger companies

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00:08:24.475 --> 00:08:26.235

or government organizations or whatever.

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00:08:26.715 --> 00:08:29.155

SMS is huge. We have to have a safety management system.

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00:08:29.775 --> 00:08:32.995

Our particular SMS at our company, I can tell you,

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00:08:33.015 --> 00:08:35.875

is based on a kind of an amalgamation of a couple of things.

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00:08:36.535 --> 00:08:38.475

Um, we work a lot in, uh,

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00:08:38.475 --> 00:08:40.155

not only in flight tests, but in training.

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00:08:40.775 --> 00:08:45.515

Uh, so our SMS started out as, uh, half a, um, a,

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00:08:45.575 --> 00:08:50.035

uh, uh, NBAA National Business Aviation, uh, based SMS.

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00:08:50.195 --> 00:08:52.035

'cause a lot of our customers on the training side come from

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00:08:52.035 --> 00:08:54.675

that side in conjunction with the safety management systems

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00:08:54.675 --> 00:08:57.845

that we've seen, um, at the companies that we've worked for.

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00:08:57.845 --> 00:08:59.445

Larger companies, I won't mention names,

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00:08:59.865 --> 00:09:01.165

but you can all guess who those were.

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00:09:01.465 --> 00:09:03.485

Um, but also experience at test pilot schools,

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00:09:03.505 --> 00:09:05.045

air Force Test, pilot School and so forth.

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00:09:05.105 --> 00:09:07.085



So we kind of put all the good elements

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00:09:07.085 --> 00:09:08.085  
of all those things together

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00:09:08.105 --> 00:09:10.205  
to make a safety management system that works

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00:09:10.545 --> 00:09:14.885  
for our operations aircraft, obviously have to be safe.

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00:09:14.885 --> 00:09:16.325  
We'll talk about that in some more detail.

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00:09:16.325 --> 00:09:19.685  
How we make sure that there are, that they are safe, uh,

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00:09:19.785 --> 00:09:20.885  
as well as the air crew.

223

00:09:20.945 --> 00:09:22.845  
And a lot of that is, is, again, through process,

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00:09:23.025 --> 00:09:24.725  
but all through attitude as well.

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00:09:25.265 --> 00:09:26.645  
Uh, and then lastly, maintenance.

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00:09:26.955 --> 00:09:29.245  
It's hard to do this without owning your own maintenance.

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00:09:31.955 --> 00:09:34.975  
Excuse me. You have to be able, you have to have processes

228

00:09:35.125 --> 00:09:39.415  
that are robust enough to, um, to catch

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00:09:39.955 --> 00:09:43.095  
the, the issues of these one-off type flight test, uh,

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00:09:43.235 --> 00:09:46.975  
flight test, um, endeavors more so than a, than a standard,

231  
00:09:47.075 --> 00:09:49.815  
you know, uh, regular part 1 45 sort

232  
00:09:49.815 --> 00:09:51.775  
of maintenance operation would be able to do.

233  
00:09:54.355 --> 00:09:55.895  
So when you get into an SMS,

234  
00:09:55.965 --> 00:09:57.535  
it's all the standard stuff everybody's seeing.

235  
00:09:57.535 --> 00:09:59.575  
We got our safety reporting form there on the right.

236  
00:09:59.995 --> 00:10:02.655  
Uh, we have our safety committee, we have safety officers,

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00:10:02.655 --> 00:10:05.615  
safety reporting systems, all those things that you're used

238  
00:10:05.615 --> 00:10:07.095  
to seeing in the bigger companies.

239  
00:10:07.115 --> 00:10:10.055  
And I get this question a lot since we are, um, when I,

240  
00:10:10.055 --> 00:10:12.295  
when I, just to, to frame the size of our company,

241  
00:10:12.305 --> 00:10:13.455  
we're about 50 people.

242  
00:10:14.155 --> 00:10:16.895  
Um, and we're up in the, uh, northeast corner

243  
00:10:17.035 --> 00:10:18.535

of Mojave Air and Spaceport.

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00:10:18.995 --> 00:10:20.375

And so we are a smaller company.

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00:10:20.995 --> 00:10:23.015

And again, I get the question a lot and,

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00:10:23.015 --> 00:10:25.375

and several of our, our colleagues are as well, our,

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00:10:25.475 --> 00:10:26.575

our similar companies.

248

00:10:26.715 --> 00:10:27.855

You know, how do you guys do safety?

249

00:10:27.955 --> 00:10:29.895

How Well, the answer's pretty simple.

250

00:10:30.015 --> 00:10:31.095

I mean, this stuff is out there,

251

00:10:31.475 --> 00:10:33.335

and everybody on this call, I now knows it.

252

00:10:33.415 --> 00:10:34.575

I we're preaching to the choir.

253

00:10:34.915 --> 00:10:36.455

You just gotta, you just gotta do it

254

00:10:36.455 --> 00:10:38.615

and implement these practices and stick to them.

255

00:10:38.995 --> 00:10:40.175

And, uh, and that's what we do.

256

00:10:40.175 --> 00:10:42.735

So there's nothing cosmic about how we do this.

257

00:10:46.555 --> 00:10:48.775

So when it gets comes down to the air crew, of course,

258

00:10:48.775 --> 00:10:50.735

you gotta have test and safety professionals.

259

00:10:51.155 --> 00:10:53.375

So folks with a background in flight tests,

260

00:10:53.375 --> 00:10:56.775

flight test instruction, um, things along those lines.

261

00:10:57.285 --> 00:10:59.215

Also, qualifications appropriate to testing.

262

00:10:59.405 --> 00:11:01.655

I've heard war, I've heard, heard it's not war stories,

263

00:11:01.655 --> 00:11:03.975

horror stories from customers that have gone

264

00:11:04.075 --> 00:11:06.535

to organizations that said, yeah, we can fly test that.

265

00:11:06.535 --> 00:11:08.695

We got airplanes, we got pilots, and all that kind of thing.

266

00:11:08.995 --> 00:11:10.255

And they go out and do their thing.

267

00:11:10.635 --> 00:11:14.415

And, and it doesn't turn out quite the way folks had

268

00:11:14.775 --> 00:11:15.775

expected it in some cases.

269

00:11:16.515 --> 00:11:18.135

Uh, it was simply just a lack

270

00:11:18.135 --> 00:11:19.415

of performance, which isn't great.

271

00:11:19.415 --> 00:11:21.175

Nobody got hurt, and in some cases people

272

00:11:21.175 --> 00:11:22.295

didn't get hurt, unfortunately.

273

00:11:22.835 --> 00:11:25.815

So, uh, again, preaching to the choir here,

274

00:11:25.815 --> 00:11:28.175

but just to make sure that the, the, uh,

275

00:11:28.475 --> 00:11:30.015

the briefing is, is caged.

276

00:11:30.015 --> 00:11:32.295

That it's really essential to make sure that you got,

277

00:11:32.295 --> 00:11:34.495

if you're doing PNFQ testing, you got A-P-N-F-Q guy.

278

00:11:34.495 --> 00:11:35.815

If you're doing spin testing, you got spin

279

00:11:35.815 --> 00:11:37.335

guy, all those sorts of things.

280

00:11:37.675 --> 00:11:40.135

And it also helps if that company has a proven record.

281

00:11:40.785 --> 00:11:42.615

Again, our company's been around since 82.

282

00:11:42.615 --> 00:11:44.855

We've been doing this for a long time, uh, as well

283

00:11:44.855 --> 00:11:45.855

as the individuals

284  
00:11:45.855 --> 00:11:48.175  
that make up our cadre have been doing this for a long time.

285  
00:11:48.835 --> 00:11:50.535  
And we take what we do seriously,

286  
00:11:50.535 --> 00:11:52.295  
and we take our reputation seriously.

287  
00:11:52.795 --> 00:11:55.285  
If we do anything that's outside the realm of safety,

288  
00:11:55.425 --> 00:11:58.685  
God forbid anyone got hurt, um, it wouldn't look good.

289  
00:11:58.865 --> 00:12:01.485  
And no one, no one would wanna talk to us, nor should they.

290  
00:12:01.785 --> 00:12:04.325  
So we gotta have that good record, uh, to make sure that,

291  
00:12:04.795 --> 00:12:06.685  
that, that our customers are

292  
00:12:06.685 --> 00:12:08.005  
comfortable coming and working with us.

293  
00:12:11.305 --> 00:12:12.325  
One of the biggest questions,

294  
00:12:12.385 --> 00:12:14.325  
and I already got that question already in the,

295  
00:12:14.325 --> 00:12:18.605  
in the brief, how do you maintain, um,

296  
00:12:19.325 --> 00:12:22.845  
a, a fleet such as ours with 20 different types of vehicles

297  
00:12:23.225 --> 00:12:26.005

and different capabilities and different missions and so on

298

00:12:26.005 --> 00:12:27.525

and so forth, how do you do that

299

00:12:28.185 --> 00:12:29.405

and how do you do it safely?

300

00:12:29.455 --> 00:12:30.765

Which is the biggest question.

301

00:12:31.635 --> 00:12:34.885

Well, again, um, when it comes down to the nuts

302

00:12:34.885 --> 00:12:37.405

and bolts of it, there's nothing really cosmic about it.

303

00:12:37.865 --> 00:12:41.045

Um, the airplanes that you choose to use have to have

304

00:12:41.045 --> 00:12:43.125

to be sub sustainable in some method.

305

00:12:43.785 --> 00:12:45.725

Um, you know, one of the things I've seen a couple times,

306

00:12:45.775 --> 00:12:46.845

again, I'm not gonna mention names,

307

00:12:46.865 --> 00:12:49.885

but you've seen, I'm guessing most of you have seen somebody

308

00:12:49.885 --> 00:12:52.685

with a, you know, a, a sign and a nail

309

00:12:52.705 --> 00:12:56.085

and an L 39 have have posted, Hey, you know, I've got a jet.

310

00:12:56.105 --> 00:12:58.485

You can come out and do jet training and jet flight test

311

00:12:58.485 --> 00:12:59.725  
and jet this with my jet.

312

00:12:59.725 --> 00:13:03.605  
Come and pay me to do that. Yeah, okay, dude, you got a jet.

313

00:13:03.605 --> 00:13:06.005  
That's nice. But how do you maintain it?

314

00:13:06.025 --> 00:13:08.325  
Do you maintain it to professional level standards?

315

00:13:08.345 --> 00:13:09.445  
Not like it's in your backyard,

316

00:13:09.445 --> 00:13:11.125  
like you're gonna go fly and have a good time.

317

00:13:11.745 --> 00:13:13.165  
And that's a, that's a big question.

318

00:13:13.165 --> 00:13:17.245  
And, and obviously our organization with our background, uh,

319

00:13:18.165 --> 00:13:20.045  
military based and so forth, um,

320

00:13:20.505 --> 00:13:22.125  
we maintain all the aircraft that we have.

321

00:13:22.145 --> 00:13:24.845  
We maintain per the military spec manuals.

322

00:13:24.845 --> 00:13:27.125  
If they are former military, obviously, if they're civilian,

323

00:13:27.185 --> 00:13:30.205  
we maintain per the, uh, the FAA manuals.

324

00:13:30.665 --> 00:13:33.525



Um, if we have challenges,

325

00:13:33.525 --> 00:13:35.085

and I'll talk about some of the challenges with parts

326

00:13:35.085 --> 00:13:37.885

and so forth in a minute, uh, we have to have solutions,

327

00:13:38.195 --> 00:13:40.525

good solutions for those, uh, for those questions.

328

00:13:41.105 --> 00:13:43.085

So it's, it is a challenge.

329

00:13:44.335 --> 00:13:46.635

Uh, everything comes down to process

330

00:13:46.895 --> 00:13:49.755

and paperwork, meaning that we have, uh,

331

00:13:49.855 --> 00:13:52.035

the manuals follow them religiously.

332

00:13:52.035 --> 00:13:54.435

We have the people that, uh, that can follow those manuals

333

00:13:54.435 --> 00:13:56.435

and have the expertise to, to, to do so

334

00:13:59.135 --> 00:14:00.275

within those airplanes.

335

00:14:00.275 --> 00:14:03.315

There's very specialized, uh, things

336

00:14:03.355 --> 00:14:04.555

that we have to do in flight tests.

337

00:14:04.565 --> 00:14:06.195

Again, as you're all aware, instrumentation,

338

00:14:06.195 --> 00:14:07.195  
and you get that question too.

339

00:14:07.265 --> 00:14:11.075  
What about instrumentation, uh, instrumentation and whatnot.

340

00:14:11.775 --> 00:14:14.835  
Um, our fleet, we're fortunate about half of our fleet,

341

00:14:14.835 --> 00:14:16.155  
roughly, is instrumented already

342

00:14:16.155 --> 00:14:17.915  
because of either flight test program,

343

00:14:18.015 --> 00:14:20.155  
or, again, we support the national test pilot school,

344

00:14:20.155 --> 00:14:21.915  
and they use our instrumented airplanes

345

00:14:21.915 --> 00:14:23.075  
for flight test instruction.

346

00:14:23.495 --> 00:14:25.755  
So when folks come to us, we can offer them airplanes

347

00:14:25.755 --> 00:14:27.955  
that are already already instrumented, which has been

348

00:14:27.955 --> 00:14:30.115  
of high value to many, uh, many customers.

349

00:14:30.495 --> 00:14:32.075  
We also have an instrumentation shop.

350

00:14:32.575 --> 00:14:35.035  
So if somebody needs instrumentation that needs

351

00:14:35.035 --> 00:14:36.515

to be installed, where does

352

00:14:36.515 --> 00:14:38.035

that come keep, you know, keep it in mind.

353

00:14:38.055 --> 00:14:40.755

The purpose of our briefing today, safety, how does

354

00:14:40.755 --> 00:14:41.875

that work with the safety process?

355

00:14:41.985 --> 00:14:43.715

Well, all that instrumentation has to go

356

00:14:43.715 --> 00:14:45.835

through our safety process and make sure it's not messing

357

00:14:45.835 --> 00:14:48.475

with the airplane systems, uh, interfering

358

00:14:48.475 --> 00:14:50.635

with flight controls, EMI, you know, all those things.

359

00:14:50.655 --> 00:14:53.010

And again, that is all part of the safety process.

360

00:14:53.185 --> 00:14:55.605

And I kind of feel like I'm saying obvious things,

361

00:14:55.625 --> 00:14:57.045

but I get these questions all the time,

362

00:14:57.065 --> 00:14:58.605

and I want to drive home that the,

363

00:14:58.665 --> 00:15:01.205

the professional organizations that do this stuff, um,

364

00:15:01.315 --> 00:15:02.365

they know what they're doing and,

365

00:15:02.365 --> 00:15:03.565  
and they go through the processes

366

00:15:03.565 --> 00:15:05.005  
that everybody, everybody is used to.

367

00:15:09.185 --> 00:15:11.285  
Um, so a question about ejection seats.

368

00:15:11.305 --> 00:15:13.565  
Uh, I'm gonna talk about that in a in a minute as well.

369

00:15:14.145 --> 00:15:18.645  
So, um, back to maintaining unique airplanes.

370

00:15:18.645 --> 00:15:22.445  
We get, we do get this question a lot. Um, how do you do it?

371

00:15:22.465 --> 00:15:24.925  
How do you take, we have our fleet of impalas that, uh,

372

00:15:24.955 --> 00:15:26.885  
that we've been flying since 1992.

373

00:15:27.445 --> 00:15:32.405  
MB 3 26 is, uh, designed in Italy, flown in South Africa,

374

00:15:32.455 --> 00:15:35.365  
flown for many years, very successful design, sold like 800

375

00:15:35.365 --> 00:15:37.285  
of 'em around the world, wonderful machines.

376

00:15:37.785 --> 00:15:40.605  
Um, but how do we maintain them as our shop in, uh,

377

00:15:40.605 --> 00:15:41.685  
in Mojave, California?

378

00:15:42.115 --> 00:15:44.085

Well, again, documentation has to be religious.

379

00:15:44.085 --> 00:15:47.765

We have the manuals and so forth to work on the airplanes.

380

00:15:47.765 --> 00:15:49.765

We have engineering drawings, things like that.

381

00:15:50.705 --> 00:15:52.845

And that's, that's what we use. We follow them.

382

00:15:52.845 --> 00:15:55.765

We have to parts, people ask us about parts.

383

00:15:56.945 --> 00:15:59.885

The, one of the great things about the Impala was, uh,

384

00:15:59.885 --> 00:16:01.645

little war story is whenever the, uh,

385

00:16:02.045 --> 00:16:04.125

whenever the South Africans quit flying Impalas,

386

00:16:04.355 --> 00:16:07.165

they sold our company, their parts store at the scrap rate.

387

00:16:07.225 --> 00:16:10.445

So we've got several conexes full of brand new parts

388

00:16:10.585 --> 00:16:13.525

for Impalas, uh, in sitting out in,

389

00:16:13.585 --> 00:16:15.205

in the desert next to our facility.

390

00:16:15.705 --> 00:16:18.765

So when we need parts for those airplanes, we have parts.

391

00:16:18.905 --> 00:16:21.805

And we're very fortunate in that sense with that airframe

392

00:16:21.805 --> 00:16:24.165

to be able to continue to operate them as we do.

393

00:16:24.705 --> 00:16:27.085

And then expertise in, in maintenance,

394

00:16:27.085 --> 00:16:28.285

who can work on the airplanes.

395

00:16:28.745 --> 00:16:30.325

So we have, uh, um,

396

00:16:30.745 --> 00:16:32.565

not tooting our own horn, our maintenance department.

397

00:16:32.605 --> 00:16:35.445

I love our guys. They're outstanding. They work really hard.

398

00:16:35.445 --> 00:16:38.405

They love what they do. And I'm sure our, our our colleagues

399

00:16:38.405 --> 00:16:40.085

and other companies have similar situations.

400

00:16:40.085 --> 00:16:41.165

You have to, to do what we do.

401

00:16:41.785 --> 00:16:44.085

Uh, but they've learned the airplanes very, very well.

402

00:16:44.465 --> 00:16:47.285

Uh, we have training programs for new maintainers

403

00:16:47.525 --> 00:16:49.165

whenever they come in, the gray beards

404

00:16:49.165 --> 00:16:51.965

who know the airplanes, pass that on, uh, pass on the,

405

00:16:52.025 --> 00:16:54.685

the tribal knowledge to the, uh, to the folks that, uh,

406

00:16:54.955 --> 00:16:56.045  
that are coming on board.

407

00:16:56.185 --> 00:16:59.445  
And, uh, and that's all documented per our part 1 45 repair

408

00:16:59.445 --> 00:17:00.525  
station and so forth.

409

00:17:01.805 --> 00:17:04.885  
Additionally, uh, when there's stuff we can't do in-house,

410

00:17:05.185 --> 00:17:06.725  
uh, for instance, engine overhauls

411

00:17:06.725 --> 00:17:09.285  
and things like that, there are reputable shops.

412

00:17:09.285 --> 00:17:11.885  
And we, again, have a QA process that we use

413

00:17:11.885 --> 00:17:13.685  
to vet those shops to make sure

414

00:17:13.685 --> 00:17:17.485  
that the engine overhauls on our airplanes are, are per the,

415

00:17:17.625 --> 00:17:20.005  
per the spec, per the military manuals and so forth.

416

00:17:20.385 --> 00:17:23.285  
So these airplanes are maintained very, very well, uh,

417

00:17:23.545 --> 00:17:26.085  
per the military manuals with OEM parts

418

00:17:26.225 --> 00:17:28.845  
and with the professionals that know how to work on them.

419  
00:17:29.105 --> 00:17:31.485  
And that's how we've been able to maintain the safety record

420  
00:17:31.485 --> 00:17:32.805  
with regard to the operations

421  
00:17:32.805 --> 00:17:34.245  
and the maintenance of these airplanes that we have.

422  
00:17:37.095 --> 00:17:41.165  
Parts specifically, uh, I mentioned the one, uh, example

423  
00:17:41.385 --> 00:17:43.485  
of the Impala 'cause we were able to get

424  
00:17:43.485 --> 00:17:45.125  
that part stored, and that's kind of rare.

425  
00:17:45.425 --> 00:17:49.045  
Um, there are other airframes that we operate

426  
00:17:49.225 --> 00:17:52.085  
and other folks operate that, uh, are not as easy.

427  
00:17:52.185 --> 00:17:54.525  
So what do you do in that case? Are the OEM parts available?

428  
00:17:54.625 --> 00:17:55.685  
Can you buy 'em sometimes?

429  
00:17:56.305 --> 00:17:57.525  
And if it's an older airplane

430  
00:17:57.525 --> 00:17:59.565  
or a unique airplane, people know they got 'em

431  
00:17:59.565 --> 00:18:01.005  
and they're not afraid to charge you for 'em.

432  
00:18:01.025 --> 00:18:04.205



So, excuse me. We can get those parts.

433

00:18:04.585 --> 00:18:07.965

And sometimes when folks come to us, we have a, a,

434

00:18:08.035 --> 00:18:09.965

there's a bill that's associated that's associated

435

00:18:09.965 --> 00:18:11.725

with our support, and that bill tends

436

00:18:11.725 --> 00:18:13.085

to be a little on the high side.

437

00:18:13.085 --> 00:18:15.445

And part of that reason is these parts sometimes aren't

438

00:18:15.445 --> 00:18:17.845

that easy to find, but we're gonna make sure we find 'em

439

00:18:17.845 --> 00:18:19.325

to make sure that the operations are safe.

440

00:18:19.825 --> 00:18:21.245

Are there acceptable replacements?

441

00:18:22.025 --> 00:18:25.805

In many cases, there are, um, for instance, in helicopters

442

00:18:25.825 --> 00:18:27.365

or are OH 50 H

443

00:18:27.365 --> 00:18:30.525

and VO one oh fives have technically the same engines.

444

00:18:31.025 --> 00:18:33.085

Um, but some of the part numbers are different.

445

00:18:33.265 --> 00:18:35.205

So we have to go through a laborious process

446  
00:18:35.305 --> 00:18:36.805  
of verifying that there really are.

447  
00:18:36.895 --> 00:18:39.245  
Those part numbers really are interchangeable

448  
00:18:39.245 --> 00:18:41.365  
and work with the OEMs and so forth and stuff like that,

449  
00:18:41.385 --> 00:18:43.365  
and make sure that those parts, those, uh,

450  
00:18:43.495 --> 00:18:46.205  
those replacement parts are acceptable and safe.

451  
00:18:46.985 --> 00:18:48.565  
And then at the end of the day, sometimes

452  
00:18:49.275 --> 00:18:51.165  
I'll be the first one to admit, sometimes parts go away,

453  
00:18:51.805 --> 00:18:54.285  
particularly, um, particularly some of the, um,

454  
00:18:54.545 --> 00:18:56.085  
the airframe parts, machine parts.

455  
00:18:57.195 --> 00:18:58.885  
What do you do? We have one airplane.

456  
00:18:58.885 --> 00:19:00.765  
We fly, uh, the fire cracker.

457  
00:19:01.385 --> 00:19:04.245  
It is a, a prototype, uh, training or aircraft.

458  
00:19:04.275 --> 00:19:05.405  
It's a great little airplane.

459  
00:19:05.585 --> 00:19:07.725

PT six does wonderful, uh, work

460

00:19:07.725 --> 00:19:09.285

for us both in training and flight test.

461

00:19:09.785 --> 00:19:13.005

Um, but they only build a handful of them, thankfully.

462

00:19:13.025 --> 00:19:15.045

We have the engineering, not only do we have the manuals,

463

00:19:15.045 --> 00:19:16.445

we have the engineering drawings for those,

464

00:19:16.625 --> 00:19:17.645

uh, for those airplanes.

465

00:19:17.705 --> 00:19:19.845

And we've had, uh, a part or two go bad.

466

00:19:19.845 --> 00:19:22.525

And we sent those engineering drawings to a machine shop

467

00:19:22.525 --> 00:19:23.685

and had them made per the spec

468

00:19:23.905 --> 00:19:24.925

and made head of shiny,

469

00:19:24.935 --> 00:19:26.525

brand new part made for the airplane.

470

00:19:26.825 --> 00:19:29.645

But again, it's per the drawing engineered

471

00:19:30.025 --> 00:19:32.525

and 100%, uh, professionally done and safe.

472

00:19:34.665 --> 00:19:36.045

So, other question about ejection seats,

473  
00:19:36.105 --> 00:19:38.565  
and here it is, there's one question I get more than any.

474  
00:19:38.565 --> 00:19:39.685  
It's about ejection seats.

475  
00:19:40.145 --> 00:19:43.165  
So we have four different airframes, uh, up in, uh,

476  
00:19:43.185 --> 00:19:45.525  
our corner of Mojave that have hot ejection seats.

477  
00:19:45.585 --> 00:19:46.645  
The Impala is one of them.

478  
00:19:47.185 --> 00:19:49.645  
Uh, the school operates, uh, L 30 nines,

479  
00:19:49.785 --> 00:19:52.005  
and, uh, they have a MIG 21 with hot seats.

480  
00:19:52.465 --> 00:19:55.365  
We operate, uh, f fives, uh, with hot seats as well.

481  
00:19:55.985 --> 00:19:59.125  
So how, how does that work? What's, what's the deal there?

482  
00:19:59.745 --> 00:20:03.645  
So, um, first of all, maintenance on the seats, uh,

483  
00:20:03.665 --> 00:20:05.605  
is a big deal that either has to be done

484  
00:20:05.665 --> 00:20:06.805  
by trained professionals.

485  
00:20:06.985 --> 00:20:09.605  
And for some of the seats that we have at our facility,

486  
00:20:09.605 --> 00:20:13.125

we've sent our maintainers to school to, to learn how

487

00:20:13.125 --> 00:20:14.725

to work and overhaul those seats

488

00:20:15.185 --> 00:20:18.165

and developed our own training programs for the new, um,

489

00:20:18.865 --> 00:20:21.405

for the new, uh, um, maintainers that come through.

490

00:20:21.785 --> 00:20:24.245

Uh, and then in some cases, the seats just have to go out,

491

00:20:24.345 --> 00:20:25.765

uh, to either manufacturers

492

00:20:25.765 --> 00:20:27.325

or recognize shops to be looked at.

493

00:20:27.585 --> 00:20:29.805

And that's, uh, that's also available

494

00:20:29.945 --> 00:20:32.765

and done in certain cases, depending on the, on the aircraft

495

00:20:32.865 --> 00:20:34.565

and also our schedule availability.

496

00:20:35.745 --> 00:20:37.405

The biggest question is pyro, man.

497

00:20:37.475 --> 00:20:38.645

That is the toughest thing,

498

00:20:38.645 --> 00:20:40.085

and that is the most expensive thing.

499

00:20:41.255 --> 00:20:43.485

About half of the maintenance costs on some

500  
00:20:43.485 --> 00:20:44.885  
of these airplanes go into the

501  
00:20:45.045 --> 00:20:46.565  
pyrotechnics on the injection seats.

502  
00:20:46.755 --> 00:20:49.605  
It's that high. The seats have to be the,

503  
00:20:49.625 --> 00:20:52.245  
the pyro in some cases, uh, is not offered

504  
00:20:52.245 --> 00:20:53.565  
by original manufacturers.

505  
00:20:54.025 --> 00:20:56.685  
So there are experts, uh, there are organizations

506  
00:20:56.685 --> 00:21:00.325  
that offer, uh, offer, uh, replacements that are certified

507  
00:21:00.385 --> 00:21:03.245  
or offer extension programs, uh, for those seats.

508  
00:21:03.665 --> 00:21:06.125  
And they are available. And, uh, again, they're not cheap,

509  
00:21:06.625 --> 00:21:08.245  
um, but they're there and they're good.

510  
00:21:08.245 --> 00:21:10.685  
And they allow us to continue to operate these airplanes,

511  
00:21:10.745 --> 00:21:12.965  
uh, safely in some cases.

512  
00:21:13.505 --> 00:21:17.045  
The question comes up, what about operating, uh, an airplane

513  
00:21:17.275 --> 00:21:20.045

that had originally had an ejection seat with cold seats?

514

00:21:20.595 --> 00:21:23.245

What, what do we think about that? Well, that depends.

515

00:21:23.375 --> 00:21:27.525

There are certain airplanes that, uh, that is entirely,

516

00:21:27.785 --> 00:21:28.805

uh, out of the question.

517

00:21:29.225 --> 00:21:31.045

Uh, a good example would be the F five

518

00:21:31.265 --> 00:21:33.405

or the MIG 21, uh, airplanes like that

519

00:21:33.405 --> 00:21:35.405

that have hydraulically boosted flight controls

520

00:21:35.405 --> 00:21:38.005

where if the engines quit, you have no options whatsoever.

521

00:21:38.505 --> 00:21:40.485

Um, that's, it's not an option to fly those,

522

00:21:40.535 --> 00:21:42.765

those vehicles without hot seats.

523

00:21:43.505 --> 00:21:44.885

Uh, some of the other airplanes,

524

00:21:44.885 --> 00:21:47.285

depending on the mission, it might be appropriate.

525

00:21:47.545 --> 00:21:49.525

Uh, we have a ACA that we operate

526

00:21:49.825 --> 00:21:52.205

and, uh, that airplane at times, uh,

527

00:21:52.205 --> 00:21:54.125  
if the pyro is not available, um,

528

00:21:54.545 --> 00:21:56.725  
or we feel it's actually safer to operate without it,

529

00:21:56.725 --> 00:21:58.325  
if we're doing cross country work or,

530

00:21:58.545 --> 00:21:59.885  
or docile sort of maneuvering

531

00:21:59.885 --> 00:22:02.725  
and stuff, that is a, a short, uh, uh,

532

00:22:02.885 --> 00:22:05.165  
Embraer Chicano is essentially a giant

533

00:22:05.445 --> 00:22:06.525  
Cherokee with a PT six.

534

00:22:07.075 --> 00:22:08.765  
It's cable pulley flight controls.

535

00:22:09.265 --> 00:22:11.245  
If the engine quits, you can glide to landing,

536

00:22:11.625 --> 00:22:12.765  
you know, all that kind of stuff.

537

00:22:13.225 --> 00:22:16.525  
So that airplane, uh, in certain circumstances is safe

538

00:22:16.525 --> 00:22:18.765  
to fly with, uh, with cold seats.

539

00:22:19.105 --> 00:22:20.805  
Now, if we're going out and we're doing spins

540

00:22:20.805 --> 00:22:23.645



and we're doing, uh, experimental flight test, then we need,

541

00:22:23.645 --> 00:22:25.725

then we need an egress method, certainly.

542

00:22:26.105 --> 00:22:28.645

Um, but there are cases where it's okay

543

00:22:28.645 --> 00:22:30.565

to fly these airplanes, uh, with cold seats,

544

00:22:30.565 --> 00:22:32.525

and we approach that on a case by case basis.

545

00:22:33.465 --> 00:22:35.565

All pilots and crew that fly on hot seats have

546

00:22:35.565 --> 00:22:37.205

to have training, just like you did in the military.

547

00:22:37.825 --> 00:22:40.365

Uh, we have FAA approved, uh,

548

00:22:40.605 --> 00:22:41.765

training programs for the seats.

549

00:22:41.825 --> 00:22:44.405

You can see in the picture there, one of our, uh, one

550

00:22:44.405 --> 00:22:45.485

of our clients is, uh,

551

00:22:45.705 --> 00:22:48.005

is getting their injection seat training, uh, for,

552

00:22:48.005 --> 00:22:49.245

that's the mark six seat that's

553

00:22:49.245 --> 00:22:50.285

in the, that's in the Impala.

554

00:22:50.345 --> 00:22:52.605

So that training is, uh, is paramount.

555

00:22:55.185 --> 00:22:57.085

So airworthiness is a big, big question.

556

00:22:59.345 --> 00:23:02.325

How do we get exper get airworthiness on airplanes like this

557

00:23:02.325 --> 00:23:04.885

that we're doing, um, that we're doing this testing on?

558

00:23:05.875 --> 00:23:07.925

Well, if it's a, if it's a civil contract,

559

00:23:07.925 --> 00:23:10.445

something we're doing for a civil, uh, organization,

560

00:23:10.755 --> 00:23:13.245

then we typically put the airplane in an experimental

561

00:23:13.245 --> 00:23:16.085

or worthiness category, probably research and development.

562

00:23:16.505 --> 00:23:20.045

And the FAA has to approve the changes that we make, either

563

00:23:20.045 --> 00:23:22.965

through our internal processes that we provide to them

564

00:23:23.505 --> 00:23:25.565

or through, uh, DER certification

565

00:23:25.825 --> 00:23:28.085

or their engineering reps, which they rarely do these days,

566

00:23:28.465 --> 00:23:29.525

uh, but they have in the past.

567

00:23:30.505 --> 00:23:32.925

So we get FAA approval to fly the airplanes,

568

00:23:32.925 --> 00:23:34.125

and if it's an RD certificate,

569

00:23:34.365 --> 00:23:35.525

they come out and check 'em every year.

570

00:23:35.665 --> 00:23:38.725

And they're under a, a pretty significant level of scrutiny.

571

00:23:39.065 --> 00:23:40.525

Uh, when it comes to FAA stuff,

572

00:23:41.105 --> 00:23:43.445

if it's the government using the airplane, either DOD

573

00:23:43.445 --> 00:23:44.965

or NASA or any of those organizations,

574

00:23:45.275 --> 00:23:47.405

then it falls under this public use category,

575

00:23:47.405 --> 00:23:50.125

which has been a back and forth between the FAA

576

00:23:50.125 --> 00:23:52.165

and the government for a number of years now.

577

00:23:52.665 --> 00:23:53.805

Uh, but then it's up to the

578

00:23:53.805 --> 00:23:55.285

utilizing agency and again, back.

579

00:23:55.505 --> 00:23:57.085

And, and that meaning, what I mean by

580

00:23:57.085 --> 00:23:58.565

that is if you're flying for the Air Force,

581  
00:23:58.565 --> 00:23:59.725  
they have their airworthiness process

582  
00:23:59.825 --> 00:24:02.005  
and that tail number that you're gonna fly for them has

583  
00:24:02.005 --> 00:24:03.805  
to go under their airworthiness process.

584  
00:24:04.465 --> 00:24:06.845  
Uh, same for the Navy and NASA and so forth.

585  
00:24:07.425 --> 00:24:09.885  
So we're, again, this comes back to a safety question.

586  
00:24:10.505 --> 00:24:14.005  
Excuse me. Now we have external organizations looking at the

587  
00:24:14.005 --> 00:24:16.565  
work that we're doing to ensure not only internally

588  
00:24:16.565 --> 00:24:18.805  
that our processes make sure that these vehicles are safe

589  
00:24:18.805 --> 00:24:21.365  
to operate, but now we have external eyes coming in

590  
00:24:21.585 --> 00:24:24.405  
and making sure that what we're doing is kosher and safe.

591  
00:24:24.865 --> 00:24:27.845  
So we have our own internal processes now we have external

592  
00:24:27.845 --> 00:24:30.405  
organizations coming in to look us over as well.

593  
00:24:30.545 --> 00:24:32.765  
So an added barrier of safety.

594  
00:24:34.935 --> 00:24:36.915

And then we talk about the operations that we're doing,

595

00:24:37.095 --> 00:24:39.635

and we look at each operation from a standpoint

596

00:24:39.735 --> 00:24:41.035

of, of risk, right?

597

00:24:41.215 --> 00:24:43.675

So are we doing DVFR? Are we doing night IFR?

598

00:24:44.275 --> 00:24:45.995

Honestly, we don't do a lot of night IFR, right?

599

00:24:46.075 --> 00:24:47.275

A lot of what we're doing is flight tests.

600

00:24:47.275 --> 00:24:50.795

So it's DVFR, local area stuff, close to home base.

601

00:24:51.135 --> 00:24:52.875

We know where there's gonna be help if we need it.

602

00:24:52.875 --> 00:24:54.315

We know how to get home. We know the

603

00:24:54.315 --> 00:24:55.995

airspace, all that kind of stuff.

604

00:24:56.875 --> 00:24:57.635

Additionally, working areas,

605

00:24:57.635 --> 00:24:58.835

where are we gonna do this stuff?

606

00:24:59.195 --> 00:25:02.395

A lot of our customers come to us solely for the fact

607

00:25:02.395 --> 00:25:03.875

that they need a, they need a sandbox,

608

00:25:03.875 --> 00:25:04.995  
they need a place to play.

609

00:25:05.385 --> 00:25:07.115  
They have, uh, their facilities,

610

00:25:07.115 --> 00:25:08.355  
particularly testing components

611

00:25:08.415 --> 00:25:09.875  
and things like that, other places

612

00:25:09.895 --> 00:25:11.475  
around the country and around the world.

613

00:25:11.665 --> 00:25:13.275  
They don't wanna try and operate in the NAS

614

00:25:13.275 --> 00:25:14.435  
with block altitudes and stuff,

615

00:25:14.635 --> 00:25:16.035  
although it's doable, it's difficult.

616

00:25:16.265 --> 00:25:18.635  
They want to come out to a place that has the ranges.

617

00:25:18.635 --> 00:25:20.275  
So it's things that they don't have to worry about.

618

00:25:20.415 --> 00:25:22.675  
And that, and frankly, that makes things a lot safer

619

00:25:22.675 --> 00:25:24.795  
because it's, it's less complication

620

00:25:25.215 --> 00:25:26.395  
and it also has several.

621

00:25:26.655 --> 00:25:29.915

Uh, we also have several, uh, re uh, facilities for,

622

00:25:30.095 --> 00:25:32.755

for assistance in, in case of, uh, of an emergency.

623

00:25:32.755 --> 00:25:35.995

You know, our, our Crash Fire rescue is trained not only in

624

00:25:35.995 --> 00:25:38.395

the standard stuff, but any, uh, additional flight tests,

625

00:25:38.535 --> 00:25:43.115

um, um, special, uh, special, um, topics that we need

626

00:25:43.115 --> 00:25:44.755

to go brief them on and things like that.

627

00:25:44.855 --> 00:25:48.915

So the area is really important, uh, to, to this,

628

00:25:49.015 --> 00:25:50.155

the safety of the flight test.

629

00:25:50.215 --> 00:25:53.715

And if we could provide an a, an area that, uh,

630

00:25:54.265 --> 00:25:56.315

that gives folks that latitude, uh,

631

00:25:56.315 --> 00:25:57.395

we increase their safety.

632

00:25:58.175 --> 00:25:59.995

Um, and of course, looking at risk level,

633

00:26:00.055 --> 00:26:02.715

we all do this low, medium, high, looking at our, uh,

634

00:26:02.715 --> 00:26:04.235

stoplight charts and so forth.

635  
00:26:04.575 --> 00:26:07.915  
Uh, that depends. That drives how much we have

636  
00:26:07.915 --> 00:26:09.835  
to take a look at some of the, you know, the maintenance

637  
00:26:09.835 --> 00:26:11.515  
and the design engineering stuff on, on

638  
00:26:11.515 --> 00:26:12.675  
what we do with these airplanes.

639  
00:26:15.385 --> 00:26:17.235  
Another thing that's interesting, uh,

640  
00:26:17.715 --> 00:26:19.675  
whenever we're doing this kind of flight test is,

641  
00:26:19.815 --> 00:26:21.875  
is who's in charge of the test?

642  
00:26:22.615 --> 00:26:23.795  
And that varies.

643  
00:26:24.135 --> 00:26:26.195  
Um, we have every, at our facility,

644  
00:26:26.245 --> 00:26:29.075  
we've had customers come in that, uh, come in

645  
00:26:29.075 --> 00:26:30.795  
and say, Hey, we just need a facility.

646  
00:26:30.885 --> 00:26:32.195  
We've got everything dialed in.

647  
00:26:32.195 --> 00:26:35.275  
We've got our test plan, we just need a home to do this

648  
00:26:35.495 --> 00:26:37.275



for a couple of weeks, or something like that.

649

00:26:37.535 --> 00:26:39.475

So they come in and we give 'em space

650

00:26:39.575 --> 00:26:41.435

and we talk 'em through the airspace area brief

651

00:26:41.495 --> 00:26:44.565

and have at it, bro, all the way to the fact that, Hey,

652

00:26:44.585 --> 00:26:46.685

we got this airplane with a modification

653

00:26:46.685 --> 00:26:47.725

and we wanna give you the airplane

654

00:26:47.725 --> 00:26:48.765

and have you run the flight test

655

00:26:48.765 --> 00:26:50.525

to do the whole certification and all that kind of stuff.

656

00:26:50.785 --> 00:26:52.125

And then we're owning a test program.

657

00:26:53.145 --> 00:26:55.205

Um, those two scenarios are pretty cut

658

00:26:55.205 --> 00:26:57.085

and dry as to who's, uh, who's calling the shots,

659

00:26:57.085 --> 00:26:58.845

particularly from a, from a safety perspective.

660

00:26:59.265 --> 00:27:01.765

But when we get into mixed test teams

661

00:27:02.425 --> 00:27:04.965

and, um, customers that come in

662

00:27:05.065 --> 00:27:07.245

and they want, you know, they want our test pilot

663

00:27:07.345 --> 00:27:10.085

and our FTEA little bit of our data analysis,

664

00:27:10.085 --> 00:27:11.325

they wanna operate on our place,

665

00:27:11.345 --> 00:27:12.485

but they wanna run the test,

666

00:27:12.995 --> 00:27:15.125

that can get a little interesting when it comes

667

00:27:15.185 --> 00:27:16.845

to the question of safety.

668

00:27:17.305 --> 00:27:20.045

The way we have handled that at our facility is in all

669

00:27:20.045 --> 00:27:22.285

of our contracts, everybody holds a safety

670

00:27:22.285 --> 00:27:23.525

hammer, including us.

671

00:27:24.225 --> 00:27:27.045

And we let the folks know when they come to our facility,

672

00:27:27.145 --> 00:27:29.165

Hey, we're gonna run this through our safety process,

673

00:27:29.625 --> 00:27:31.245

and if we don't like what we see, we're not gonna do it.

674

00:27:31.385 --> 00:27:35.525

And by the way, you know, payment is not based on execution

675

00:27:35.525 --> 00:27:37.605

for a safety reason on either side.

676

00:27:38.065 --> 00:27:41.725

So that has, that has led to some interesting conversations.

677

00:27:41.825 --> 00:27:43.325

The good news is, is as long

678

00:27:43.325 --> 00:27:45.965

as those conversations are had at the beginning

679

00:27:45.965 --> 00:27:48.085

of the program, when the contract is being written,

680

00:27:48.515 --> 00:27:50.605

it's usually pretty well received by everybody.

681

00:27:50.845 --> 00:27:52.845

'cause it makes everybody comfortable to know

682

00:27:53.115 --> 00:27:54.365

that they have the safety hammer

683

00:27:54.705 --> 00:27:58.565

and that they can, they can, uh, they can call, call a cease

684

00:27:58.625 --> 00:28:01.005

and help this help the program and make it safer.

685

00:28:01.425 --> 00:28:05.165

But it's really important as you, as you roll into some

686

00:28:05.165 --> 00:28:08.165

of these hybrid, um, hybrid flight test programs,

687

00:28:08.165 --> 00:28:10.285

hybrid test teams, to determine who's

688

00:28:10.285 --> 00:28:11.325

that hammer, who has that hammer?

689

00:28:11.425 --> 00:28:14.205

And contractually write it down as to who can,

690

00:28:14.505 --> 00:28:17.845

who can say yes and no to, to doing certain, uh, events.

691

00:28:22.405 --> 00:28:26.265

So lastly, so let's say you work for a big OEM

692

00:28:26.325 --> 00:28:29.865

or the Air Force or whoever, and you wanna go out

693

00:28:29.865 --> 00:28:31.065

and hire somebody, uh,

694

00:28:31.165 --> 00:28:33.025

all I can tell you is be cautious in your selection.

695

00:28:33.025 --> 00:28:34.745

Obviously, I think very highly of our facility.

696

00:28:34.765 --> 00:28:36.345

I'm extremely proud of the work

697

00:28:36.345 --> 00:28:37.905

that our facility has done over the years.

698

00:28:38.325 --> 00:28:42.105

Uh, but I've seen a lot of, um, other, other places that,

699

00:28:42.165 --> 00:28:44.145

uh, I've, I've, I've been a part

700

00:28:44.205 --> 00:28:46.505

of programs at other places I've worked, uh,

701

00:28:46.505 --> 00:28:48.345

where we've met some, met

702

00:28:48.345 --> 00:28:50.945

with some suboptimal test results, if you will.

703

00:28:51.415 --> 00:28:54.905

Look at their capabilities, what they say they can do versus

704

00:28:55.335 --> 00:28:58.025

what they actually can do and what they have done.

705

00:28:58.125 --> 00:29:00.265

Can they provide you with examples?

706

00:29:00.845 --> 00:29:03.785

Um, do they have in-house maintenance or is it farmed out?

707

00:29:03.785 --> 00:29:05.305

This is so huge. I,

708

00:29:05.385 --> 00:29:06.905

I can't say enough about our maintenance staff.

709

00:29:06.985 --> 00:29:08.505

I love our guys. They work their tails off.

710

00:29:08.505 --> 00:29:10.105

They know the airplanes like the back of their hand,

711

00:29:10.245 --> 00:29:12.025

and we couldn't do what we do without 'em.

712

00:29:12.525 --> 00:29:13.985

Uh, when we're doing flight testing

713

00:29:14.325 --> 00:29:16.545

and we're looking at modifying airplanes, airplanes

714

00:29:16.545 --> 00:29:18.705

that they know, we go, Hey, dude, what if we do this?

715

00:29:18.755 --> 00:29:20.385

Don't know. You can't do that

716

00:29:20.385 --> 00:29:21.985

because there's this thing here or that thing there.

717

00:29:22.125 --> 00:29:25.065

Or better yet, when we come, come to them with an idea,

718

00:29:25.065 --> 00:29:26.465

they tell us why our idea is bad,

719

00:29:26.465 --> 00:29:27.745

but they come up with a better idea

720

00:29:28.245 --> 00:29:29.945

and they're there to shepherd it.

721

00:29:29.945 --> 00:29:32.865

And they're really the hands-on guys that can respond

722

00:29:32.885 --> 00:29:34.865

to the modifications we wanna make.

723

00:29:34.885 --> 00:29:36.665

If you don't have that while you're doing, uh,

724

00:29:36.665 --> 00:29:38.465

flight testing and you gotta farm out maintenance,

725

00:29:38.465 --> 00:29:39.825

every time there's a problem with the airplane,

726

00:29:40.015 --> 00:29:41.245

that gets really challenging.

727

00:29:41.705 --> 00:29:43.245

Uh, so it's, it's hard to do.

728

00:29:44.185 --> 00:29:46.405

And then we already, we already talked about experience.

729

00:29:46.795 --> 00:29:50.005

I'll tell one war story, uh, with a company

730

00:29:50.005 --> 00:29:51.165  
that will remain nameless.

731

00:29:51.505 --> 00:29:52.765  
And another, before I,

732

00:29:52.765 --> 00:29:54.445  
before I start working at flight research, years ago,

733

00:29:54.445 --> 00:29:55.445  
I worked for another organization

734

00:29:56.345 --> 00:29:58.965  
and all names will be, will be, uh,

735

00:29:59.445 --> 00:30:00.925  
redacted to protect the innocent.

736

00:30:01.465 --> 00:30:04.285  
But we hired an organization, uh, to do a,

737

00:30:04.445 --> 00:30:05.565  
a short run flight test.

738

00:30:05.625 --> 00:30:08.165  
We just needed to do one or two flights on a new component.

739

00:30:08.865 --> 00:30:10.885  
And this organization, I don't know

740

00:30:11.055 --> 00:30:13.325  
where the folks found it, they found these folks.

741

00:30:13.385 --> 00:30:15.965  
And, uh, I was tasked to lead the, the flight tests.

742

00:30:16.035 --> 00:30:17.165  
It's like, okay, here you're gonna go

743  
00:30:17.165 --> 00:30:20.205  
and you're gonna fly this thing with this dude at his, uh,

744  
00:30:20.425 --> 00:30:22.165  
mom and pop flight test organization.

745  
00:30:22.185 --> 00:30:23.405  
And we told him what you wanna do,

746  
00:30:23.905 --> 00:30:25.845  
and, um, you're cleared hot

747  
00:30:25.845 --> 00:30:27.405  
and it's all paid for and all that good stuff.

748  
00:30:28.025 --> 00:30:29.525  
So we talked to the guy,

749  
00:30:29.625 --> 00:30:31.365  
we went over the flight test, we talked to him.

750  
00:30:31.465 --> 00:30:33.325  
He didn't really have much of a safety process,

751  
00:30:33.425 --> 00:30:35.125  
it was just kind of him and his airplanes.

752  
00:30:36.065 --> 00:30:37.485  
And, uh, long story short,

753  
00:30:37.485 --> 00:30:39.525  
we were out in the airplane doing a couple maneuvers,

754  
00:30:39.525 --> 00:30:42.365  
and I looked over at the, at number one at the left engine,

755  
00:30:42.405 --> 00:30:44.965  
I saw a bead of oil on the back of the, uh, of the,

756  
00:30:44.965 --> 00:30:46.365



uh, engine cowling.

757

00:30:46.365 --> 00:30:48.645

And I said, Hey, man, got some oil back there.

758

00:30:49.225 --> 00:30:50.445

And, uh, he said, yeah, you know,

759

00:30:50.445 --> 00:30:52.285

my mechanic hates it when we do stuff like this

760

00:30:52.305 --> 00:30:54.165

and that come back and there's no oil left in the engine,

761

00:30:55.385 --> 00:30:58.045

and that would get anybody's attention, right?

762

00:30:58.065 --> 00:31:01.605

And at that point, we, uh, I calmly ceased the testing

763

00:31:01.825 --> 00:31:03.445

and said, why don't we go head on back?

764

00:31:03.445 --> 00:31:04.805

We got some stuff we gotta talk about.

765

00:31:05.425 --> 00:31:06.685

So we went back and obviously we

766

00:31:06.685 --> 00:31:07.805

didn't use that facility again.

767

00:31:08.265 --> 00:31:10.525

Um, so that's the kind of threats that are out there,

768

00:31:10.945 --> 00:31:13.925

as opposed to folks that, uh, are part of, again,

769

00:31:13.925 --> 00:31:16.365

the more professional organizations that have the things

770  
00:31:16.365 --> 00:31:18.485  
that you would expect to see and that you can challenge them

771  
00:31:18.485 --> 00:31:19.965  
and ask them to see if they have it.

772  
00:31:22.905 --> 00:31:26.005  
Um, other challenges when you get into this kind of, uh,

773  
00:31:26.075 --> 00:31:28.205  
this kind of flight test, again, from a safety standpoint,

774  
00:31:28.605 --> 00:31:31.725  
contracts get very unique with sets of, uh, sets

775  
00:31:31.725 --> 00:31:33.965  
of requirements and does not fit a mold

776  
00:31:34.145 --> 00:31:36.285  
of standard contracts, either from a safety

777  
00:31:36.305 --> 00:31:37.565  
or a general standpoint.

778  
00:31:38.025 --> 00:31:40.045  
Uh, because there's very, you know,

779  
00:31:40.385 --> 00:31:42.845  
we wanna put this camera here, looking at this angle,

780  
00:31:42.845 --> 00:31:44.125  
taking this thing and all that.

781  
00:31:44.265 --> 00:31:45.605  
So you have to be very specific

782  
00:31:45.905 --> 00:31:47.845  
or have a robust contract that can,

783  
00:31:48.195 --> 00:31:50.005

that can be remain flexible.

784

00:31:50.505 --> 00:31:52.765

You wanna talk about insurance that comes back to safety

785

00:31:52.765 --> 00:31:56.165

because that talks about ri risk tolerance, um, um,

786

00:31:56.245 --> 00:31:58.325

intellectual property, not really a safety thing,

787

00:31:58.325 --> 00:32:01.525

but something that will come up in the, uh, in the, uh, um,

788

00:32:02.285 --> 00:32:04.405

contracts and then, uh, clearances

789

00:32:04.405 --> 00:32:05.445

and any proprietary information.

790

00:32:05.755 --> 00:32:08.325

I've got a ton of videos as I'm giving you this brief.

791

00:32:08.445 --> 00:32:10.325

I got all this stuff I would love to show you.

792

00:32:10.625 --> 00:32:12.045

My customers just wouldn't be really

793

00:32:12.045 --> 00:32:13.245

happy if I showed it to you.

794

00:32:13.345 --> 00:32:15.525

So again, proprietary issues and,

795

00:32:15.525 --> 00:32:16.885

and clearance issues can come up

796

00:32:16.885 --> 00:32:19.245

and that all has a impact on safety, right?

797

00:32:20.825 --> 00:32:22.925

So, uh, what I talked about today, the, the,

798

00:32:22.955 --> 00:32:25.005

this civil contract flight test is out there.

799

00:32:25.225 --> 00:32:27.485

It can be done very professionally, very safely

800

00:32:27.835 --> 00:32:29.165

with the right providers.

801

00:32:29.225 --> 00:32:30.645

Flight research in Mojave.

802

00:32:30.645 --> 00:32:31.805

Gotta throw it out there to us,

803

00:32:32.025 --> 00:32:33.445

but we're not the only ones out there.

804

00:32:33.865 --> 00:32:34.965

Uh, each one is unique.

805

00:32:34.965 --> 00:32:37.445

We have our different capabilities, our different aircraft,

806

00:32:37.945 --> 00:32:39.405

air crew, different size

807

00:32:39.805 --> 00:32:41.045

companies and different experiences.

808

00:32:41.145 --> 00:32:44.285

But we're all here for you, uh, to support whatever, uh,

809

00:32:44.605 --> 00:32:46.125

whatever flight test needs you have.

810

00:32:46.125 --> 00:32:47.725

And we're happy, we're happy to do that.

811

00:32:49.905 --> 00:32:51.245

So with that, I'll take some questions.

812

00:32:51.245 --> 00:32:53.725

There's, uh, there's my contact information.

813

00:32:54.145 --> 00:32:57.365

Uh, you can feel free to, uh, to shoot me an email

814

00:32:57.625 --> 00:32:59.525

or, uh, gimme a call anytime you like.

815

00:32:59.605 --> 00:33:01.725

I, I love talking about flight test and airplanes

816

00:33:01.725 --> 00:33:04.485

and safety, so feel free to, uh, to ask anytime.

817

00:33:05.225 --> 00:33:07.325

Um, so one question,

818

00:33:07.435 --> 00:33:08.805

I've already got a couple questions here.

819

00:33:09.305 --> 00:33:12.725

Uh, one was about the 3 26 accident that was in, um,

820

00:33:12.985 --> 00:33:14.045

in Moja in March.

821

00:33:14.555 --> 00:33:16.485

Unfortunately, the investigation is still

822

00:33:16.485 --> 00:33:17.965

ongoing in that event.

823

00:33:19.225 --> 00:33:21.405

Um, so I can't say anything official.

824

00:33:21.405 --> 00:33:24.245

The NTSB is still wrapping up their investigation.

825

00:33:24.905 --> 00:33:29.645

Uh, what I can tell you is, um, that both, uh, uh,

826

00:33:29.785 --> 00:33:32.165

so it was, it was an airplane owned by flight research

827

00:33:32.965 --> 00:33:34.685

operated by the national test pilot school.

828

00:33:34.945 --> 00:33:37.765

Uh, both organizations are operating the Impalas, uh,

829

00:33:37.765 --> 00:33:40.525

full up again after our own internal investigations.

830

00:33:41.025 --> 00:33:44.885

Uh, so we have, uh, uh, analyzed the situation,

831

00:33:45.245 --> 00:33:48.245

analyzed the event, uh, taken appropriate safety measures

832

00:33:48.345 --> 00:33:50.045

to, uh, to mitigate any recurrence

833

00:33:50.425 --> 00:33:52.245

and, uh, continue to operations.

834

00:33:52.745 --> 00:33:55.165

And the reason for that will come out in the, uh,

835

00:33:55.185 --> 00:33:57.645

in the NTSB report, uh, when it does,

836

00:33:57.645 --> 00:33:58.765

when it is finally released.

837

00:33:59.185 --> 00:34:01.725

Uh, but unfortunately 'cause it's an ongoing investigation

838

00:34:02.265 --> 00:34:03.325

and, uh, and we are,

839

00:34:03.625 --> 00:34:05.285

we are assisting with that investigation.

840

00:34:05.485 --> 00:34:08.605

I can't say more than that. Uh, another question.

841

00:34:08.625 --> 00:34:10.125

Are any of the seats zero? Zero? Yeah.

842

00:34:10.225 --> 00:34:12.725

Um, a couple of seats are R zero zero.

843

00:34:13.385 --> 00:34:15.845

Um, the APOL seats are zero, zero.

844

00:34:16.465 --> 00:34:19.765

The, uh, F five, L 39 are not,

845

00:34:20.225 --> 00:34:21.445

and I'm not sure about the mig.

846

00:34:21.625 --> 00:34:24.125

Um, I haven't, I haven't looked at that one in a while,

847

00:34:24.145 --> 00:34:25.925

so I, I'd have to go answer that question.

848

00:34:28.675 --> 00:34:32.645

Well, any, any other questions, uh, that folks, uh, have

849

00:34:32.705 --> 00:34:36.245

for me, uh, regarding the, regarding this topic

850

00:34:36.305 --> 00:34:37.525

or anything else that we do?

851

00:34:44.845 --> 00:34:47.455

Okay, I think we're coming right up on break time.

852

00:34:47.675 --> 00:34:49.655

Is that right? Turbo?

853

00:34:50.295 --> 00:34:53.775

I did that on purpose. Yeah, it's very good timing.

854

00:34:56.715 --> 00:34:58.055

Yep. Well done Gary. Thanks.

855

00:34:58.195 --> 00:35:00.335

Uh, we'll take ourselves into the break

856

00:35:00.475 --> 00:35:01.495

so it'll run the clock.

857

00:35:01.555 --> 00:35:03.335

So we'll see everyone in about 15 minutes.

858

00:35:05.145 --> 00:35:05.265

I.