

WEBVTT

1

00:00:00.025 --> 00:00:00.285

All right.

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00:00:00.285 --> 00:00:01.285

Good morning.

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00:00:01.785 --> 00:00:06.095

Uh, Let's see if I can get this

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00:00:06.875 --> 00:00:08.985

Slide deck to Back up.

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00:00:09.055 --> 00:00:12.145

Okay. Good morning. Uh, my name's, uh, Raymond Shriner.

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00:00:12.185 --> 00:00:13.185

I go by rj.

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00:00:13.485 --> 00:00:17.745

Uh, I'm a, uh, former Marine, uh, test pilot.

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00:00:18.085 --> 00:00:19.745

Uh, always a Marine, but, uh,

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00:00:19.965 --> 00:00:22.745

but I was, uh, a test pilot for the Marine Corps.

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00:00:22.825 --> 00:00:25.585

I flew cobras, uh, since I left the uniform,

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00:00:25.975 --> 00:00:29.465

I've been working in the eval industry, uh, and, uh,

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00:00:29.605 --> 00:00:31.065

and so I've been working with, uh,

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00:00:31.385 --> 00:00:32.865

companies like Whisk Superal,

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00:00:32.865 --> 00:00:36.545

and now Pivotal, uh, in these, uh, this, uh, new industry,

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00:00:36.605 --> 00:00:39.705

the startup industry teaching, uh, just bringing up these,

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00:00:39.965 --> 00:00:43.545

uh, young new, uh, test teams, uh,

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00:00:43.685 --> 00:00:45.985

and trying to teach them the craft of flight tests.

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00:00:46.125 --> 00:00:48.565

So, that's my background.

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00:00:48.865 --> 00:00:51.805

Uh, thank you for the opportunity to speak this morning.

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00:00:52.225 --> 00:00:53.485

Uh, this, it's a pleasure.

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00:00:53.585 --> 00:00:56.205

Uh, this is my opportunity to give back to the community,

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00:00:56.425 --> 00:01:00.165

try to, uh, bridge, uh, the gap between, uh, maybe some

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00:01:00.165 --> 00:01:02.885

of the startups and some of these established OEMs.

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00:01:03.265 --> 00:01:08.005

Uh, the idea behind this presentation this morning is, uh,

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00:01:08.865 --> 00:01:12.045

to try and, uh, mentor, coach

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00:01:12.105 --> 00:01:14.525

and teach some of the startups out there

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00:01:14.525 --> 00:01:17.045

that might not have the benefit of all the resources

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00:01:17.045 --> 00:01:18.525
that the larger OEMs have.

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00:01:18.905 --> 00:01:20.525
So that's sort of the mentality

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00:01:20.835 --> 00:01:22.565
with which I, I created the brief.

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00:01:23.025 --> 00:01:25.605
Uh, and as we go through this, just keep in mind this is,

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00:01:25.605 --> 00:01:29.165
this is my perspective as sort of a, a crayon Eaton Marine,

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00:01:29.625 --> 00:01:32.005
uh, trying to teach young, uh, test teams

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00:01:32.065 --> 00:01:33.125
how to do flight test.

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00:01:37.515 --> 00:01:39.295
So why focus on the basics?

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00:01:39.915 --> 00:01:44.175
Uh, well, one is, uh, I, I actually suggested it at one

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00:01:44.175 --> 00:01:46.535
of the, uh, one of the, uh, board meetings.

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00:01:46.535 --> 00:01:48.255
And they said, Hey, that's a great idea, rj.

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00:01:48.255 --> 00:01:49.295
Why don't we go ahead and do that?

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00:01:49.875 --> 00:01:53.895
So, uh, but it's the, the reality is it's really easy for us

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00:01:53.935 --> 00:01:56.535

to get caught up in our daily lives, and, uh,

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00:01:56.595 --> 00:01:59.815

and then we lose sight of, of the fundamentals, uh,

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00:02:00.205 --> 00:02:01.535

from my marine time.

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00:02:01.995 --> 00:02:05.095

Uh, my favorite leadership principle is know yourself

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00:02:05.095 --> 00:02:06.175

and seek self-improvement.

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00:02:06.175 --> 00:02:07.455

And I think that's a continuous process.

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00:02:07.555 --> 00:02:10.055

And so that's something that I take, uh, to work every day.

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00:02:10.835 --> 00:02:13.255

Uh, it's an opportunity for us in this room.

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00:02:13.275 --> 00:02:14.775

And as I look around, I see a lot

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00:02:14.775 --> 00:02:18.215

of experience in this room, uh, probably people with 30,

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00:02:18.215 --> 00:02:20.455

40 years of, uh, aviation experience.

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00:02:20.455 --> 00:02:23.775

And so you take a lot of what you know for granted, uh,

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00:02:23.955 --> 00:02:25.815

but think about some of these young test teams

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00:02:25.885 --> 00:02:29.615

that have young, bright engineers that just don't have the,

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00:02:29.635 --> 00:02:32.175

the benefit of that formal, uh, training

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00:02:32.315 --> 00:02:34.695

and the, uh, the formal processes that you have.

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00:02:34.715 --> 00:02:37.175

And so, it's an opportunity for us to share some of those.

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00:02:38.755 --> 00:02:40.895

And then it's an opportunity for us to either hone

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00:02:40.915 --> 00:02:43.335

or re-home some of the skills that you have

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00:02:43.395 --> 00:02:44.735

and maybe, maybe, uh,

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00:02:44.835 --> 00:02:46.535

recall something that you might've forgotten.

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00:02:47.115 --> 00:02:48.775

Uh, and then there's a direct relationship

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00:02:48.775 --> 00:02:50.455

to flight test safety that we can take

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00:02:50.455 --> 00:02:51.615

back to our organizations.

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00:02:54.165 --> 00:02:58.665

So, uh, any of you know, Al Jefferson, uh, this is a, a,

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00:02:59.085 --> 00:03:00.405

a product that he provided.

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00:03:00.865 --> 00:03:02.645

Uh, I can't even remember where it came from,

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00:03:02.665 --> 00:03:04.005

but it, it always stuck with me.

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00:03:04.005 --> 00:03:06.645

And this is kind of my brain on flight test, right?

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00:03:07.025 --> 00:03:10.165

So the idea here is that it's, it's vast in the number

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00:03:10.165 --> 00:03:12.005

of things and skills that you have to have.

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00:03:12.865 --> 00:03:14.845

And, uh, so, uh,

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00:03:14.845 --> 00:03:18.645

but it's very, it, it, it's not, uh, well organized and, uh,

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00:03:18.705 --> 00:03:20.965

but it, this is sort of the, the landscape

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00:03:20.965 --> 00:03:22.125

with which we talk about.

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00:03:23.715 --> 00:03:24.855

Can you still hear, okay,

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00:03:24.975 --> 00:03:26.575

I I just wanna make sure the mic's still working.

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00:03:27.115 --> 00:03:29.295

Uh, and so this is, this is kind

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00:03:29.295 --> 00:03:31.335

of the way my brain thinks about flight tests,

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00:03:31.335 --> 00:03:32.415

but it's not very organized.

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00:03:34.895 --> 00:03:35.955

So there's a couple key

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00:03:35.955 --> 00:03:37.355

concepts that I just want to get up front.

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00:03:37.535 --> 00:03:40.395

Uh, just mental models for us all to share, uh,

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00:03:40.455 --> 00:03:43.395

and make sure that we've got, uh, the same mental model, uh,

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00:03:43.605 --> 00:03:45.915

going forward into the rest of the workshop.

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00:03:45.915 --> 00:03:48.155

And the re and really the rest of the next two days.

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00:03:48.815 --> 00:03:51.075

And one of them is that there's this relationship,

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00:03:51.095 --> 00:03:53.875

the Venn diagram between safety and risk management,

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00:03:54.215 --> 00:03:55.915

and then efficiency and effectiveness.

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00:03:56.295 --> 00:03:59.435

And as I've, uh, joined various teams with, uh,

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00:03:59.435 --> 00:04:02.235

these small teams in Silicon Valley that are trying to, uh,

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00:04:02.245 --> 00:04:05.875

stand up flight test, that's always the balance

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00:04:05.905 --> 00:04:06.995

that we're trying to strike,

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00:04:07.015 --> 00:04:08.555

is we wanna make sure we're effective,

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00:04:08.555 --> 00:04:10.035
we're efficient, and we're safe.

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00:04:13.075 --> 00:04:17.425
And then the other way I think about flight test safety is

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00:04:17.495 --> 00:04:20.585
that it's a fabric, and it's woven into

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00:04:20.585 --> 00:04:21.945
everything that we do.

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00:04:22.755 --> 00:04:24.735
And it's throughout all of our processes.

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00:04:24.755 --> 00:04:26.895
If you think about the way you spend your day

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00:04:26.915 --> 00:04:31.175
as a flight tester, and you show up and you go to these CCBs

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00:04:31.195 --> 00:04:35.335
and, uh, you know, configuration control board, the FTRB,

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00:04:35.365 --> 00:04:37.655
your processes, your brief, your debrief,

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00:04:37.715 --> 00:04:40.695
the way you capture lessons, it's all woven in there.

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00:04:41.075 --> 00:04:43.055
And it creates our safety culture.

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00:04:43.875 --> 00:04:46.975
Uh, the, the safety culture is built around a number

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00:04:46.975 --> 00:04:49.055
of different things, leadership and all those other stuff.

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00:04:49.075 --> 00:04:50.975

But the, the daily activities that we do,

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00:04:51.445 --> 00:04:52.455

it's all woven in there.

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00:04:52.455 --> 00:04:54.495

It's not real neat, and it's difficult to sort

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00:04:54.495 --> 00:04:56.335

of think about it in those terms.

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00:04:58.035 --> 00:05:01.375

So the way I think about it also is

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00:05:01.375 --> 00:05:03.655

that the fundamentals are our base,

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00:05:04.035 --> 00:05:06.095

and it allows us to, uh,

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00:05:06.485 --> 00:05:08.575

achieve those more difficult things at

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00:05:08.575 --> 00:05:09.615

the top of the pyramid.

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00:05:10.475 --> 00:05:12.615

Uh, but if you don't have the fundamentals,

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00:05:12.615 --> 00:05:15.415

you just don't have the, the foundation to do those things.

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00:05:15.435 --> 00:05:18.175

And that's where you find often a lot of misses.

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00:05:21.465 --> 00:05:24.325

And so, as I think about the hierarchy of flight test,

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00:05:25.875 --> 00:05:28.215

I'm focused on that center section, right?

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00:05:28.515 --> 00:05:31.415

Uh, the lowest layer is

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00:05:31.415 --> 00:05:34.775

where you find your basic airmanship, all your basic skills,

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00:05:34.805 --> 00:05:36.535

your engineering fundamentals.

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00:05:36.955 --> 00:05:38.655

That's not the focus of today,

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00:05:39.375 --> 00:05:40.775

although it's important, right?

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00:05:41.595 --> 00:05:44.455

Uh, but the stuff that I'm focused on is that center section

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00:05:44.475 --> 00:05:47.335

of the pyramid there that allows us to get to

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00:05:47.335 --> 00:05:49.535

that advanced flight testing.

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00:05:50.155 --> 00:05:52.655

And that's where you find envelope expansion

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00:05:52.835 --> 00:05:57.475

and the edge of the envelope stuff, the high risk, new

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00:05:57.475 --> 00:06:01.915

and novel, complex systems, degraded systems, uh, night,

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00:06:01.985 --> 00:06:04.275

high speed, high altitude, all that stuff, all

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00:06:04.275 --> 00:06:05.715

that sexy stuff that we want to do.

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00:06:05.715 --> 00:06:09.035

But we have to have the fundamentals, uh, in place in order

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00:06:09.035 --> 00:06:10.115

to be able to do those things.

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00:06:10.975 --> 00:06:15.395

So that's kind of the idea behind, uh, the, the brilliance

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00:06:15.395 --> 00:06:17.675

and the basics as, as far as I see.

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00:06:20.795 --> 00:06:24.615

And then it's also worth thinking about the transformation

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00:06:24.615 --> 00:06:26.175

that occurs at test pilot school.

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00:06:26.435 --> 00:06:28.535

So a lot of people in this room, if you look around,

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00:06:28.535 --> 00:06:30.255

have been, if you've been to test pilot school,

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00:06:30.255 --> 00:06:31.375

if you've had the benefit of

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00:06:31.375 --> 00:06:32.495

going through that, raise your hand.

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00:06:33.195 --> 00:06:36.535

You look around, and I would say at least half the room

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00:06:37.155 --> 00:06:38.335

has their hand up right now.

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00:06:38.555 --> 00:06:40.695

So there's, uh, half the room has been

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00:06:40.695 --> 00:06:43.175

through a formal flight test training, which is great

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00:06:45.645 --> 00:06:46.705
at test pilot school.

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00:06:46.725 --> 00:06:49.625
The students enter, they've already got experience

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00:06:49.625 --> 00:06:51.465
as aviators or engineers, right?

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00:06:51.485 --> 00:06:53.865
So they're established in their, in their skills

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00:06:54.245 --> 00:06:57.545
as a tactical, uh, operator, if you're an aviator.

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00:06:57.925 --> 00:06:59.905
And then probably if you're an engineer, you've been

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00:06:59.905 --> 00:07:01.425
around the, the program office

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00:07:01.445 --> 00:07:03.305
or the acquisition world for a little while,

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00:07:05.905 --> 00:07:07.485
And then test pilot school is gonna take you

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00:07:07.485 --> 00:07:11.925
through a gauntlet of academics and training and exercises.

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00:07:13.015 --> 00:07:16.815
Uh, and then you, you exercise

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00:07:17.085 --> 00:07:19.855
what I call rigor in the flight test process.

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00:07:21.035 --> 00:07:23.935
And it starts with technical theory, right?

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00:07:23.955 --> 00:07:27.655

So that's the basis with which they, their founding, uh,

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00:07:27.875 --> 00:07:30.495

the formation of, of their flight test is, it starts

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00:07:30.495 --> 00:07:33.735

with theory, and then they're gonna teach you the test

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00:07:33.735 --> 00:07:37.375

methodology of test planning, test briefing, execute,

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00:07:37.605 --> 00:07:41.535

debrief, do the data analysis, and then test reporting.

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00:07:42.955 --> 00:07:44.895

And that's all I like to joke.

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00:07:44.975 --> 00:07:46.855

I they should call it test writing school

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00:07:46.915 --> 00:07:48.135

and not test pilot school.

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00:07:48.135 --> 00:07:49.575

So they actually tricked me when they said

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00:07:49.685 --> 00:07:50.855

test pilot school.

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00:07:51.115 --> 00:07:55.215

So, 'cause you spend most of your time, uh, writing as,

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00:07:55.275 --> 00:08:00.215

as many of you know, and then you emerge as a generalist,

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00:08:00.915 --> 00:08:05.095

uh, and you're able you're able to apply that process

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00:08:05.915 --> 00:08:07.255

to new and novel designs.

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00:08:07.255 --> 00:08:09.175
That's the idea. You're still don't have a whole lot

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00:08:09.175 --> 00:08:11.335
of experience, but you have this sort

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00:08:11.335 --> 00:08:13.495
of blue belt capability to apply

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00:08:13.495 --> 00:08:15.015
that process that they've taught you.

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00:08:15.275 --> 00:08:18.695
And that process, by the way, has not changed in prob,

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00:08:18.815 --> 00:08:20.775
I don't know, you know, it hadn't changed much.

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00:08:21.235 --> 00:08:23.935
Uh, maybe how they, uh, shake

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00:08:23.935 --> 00:08:25.575
and bake some of the, uh, hazards

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00:08:25.575 --> 00:08:27.695
or something has, has evolved,

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00:08:27.995 --> 00:08:30.215
but the process itself has not changed

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00:08:30.585 --> 00:08:31.695
since we started flying.

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00:08:34.705 --> 00:08:38.005
And so I tried to distill this down into

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00:08:38.195 --> 00:08:41.755
what do I think the basics are, and,

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00:08:42.335 --> 00:08:44.355

and then what's the, where's the brilliance, right?

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00:08:44.855 --> 00:08:47.515

Uh, and, uh, I was able

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00:08:47.515 --> 00:08:50.155

to distill it down into these basically, uh,

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00:08:50.305 --> 00:08:51.315

five different areas.

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00:08:52.055 --> 00:08:53.595

Uh, and then I'll talk about some

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00:08:53.595 --> 00:08:55.485

of the brilliance elements here in a minute.

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00:08:55.625 --> 00:08:58.885

But, uh, but really it boils down to have a test plan.

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00:08:59.685 --> 00:09:02.305

You know, uh, if, if you were to sort of, uh,

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00:09:02.305 --> 00:09:05.545

imagine yourself teaching a young startup company

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00:09:05.815 --> 00:09:08.265

that doesn't have any formal flight, uh, testing,

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00:09:08.405 --> 00:09:09.425

it starts with the plan.

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00:09:10.195 --> 00:09:13.575

Uh, and, uh, some, some companies are gonna document it.

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00:09:13.735 --> 00:09:15.455

Some companies are not gonna document it,

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00:09:15.835 --> 00:09:17.655

but you have to have a solid plan.

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00:09:18.275 --> 00:09:20.735

Um, it's best if you document it, uh,

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00:09:21.475 --> 00:09:23.895

but, uh, train and prepare the team.

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00:09:24.315 --> 00:09:26.575

So you have to prepare those individuals

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00:09:26.575 --> 00:09:27.735

for the test that you're gonna do.

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00:09:28.595 --> 00:09:31.495

Uh, when you're showing up to an organization

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00:09:31.495 --> 00:09:33.055

that doesn't have any processes

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00:09:33.075 --> 00:09:36.695

and doesn't have any, uh, established way to do that,

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00:09:37.195 --> 00:09:39.815

not only are you creating a product,

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00:09:40.555 --> 00:09:43.575

but you're also developing a team, right?

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00:09:43.955 --> 00:09:46.975

And so, imagine yourself, uh, trying to teach a team

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00:09:47.685 --> 00:09:49.895

what is it that they need to do in order

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00:09:49.895 --> 00:09:51.655

to get this test, uh, going.

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00:09:51.755 --> 00:09:53.575

And they don't even have the basic, uh,

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00:09:53.805 --> 00:09:55.215

processes established yet.

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00:09:55.515 --> 00:09:58.255

It can be done, and it doesn't need to be real heavy,

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00:09:58.715 --> 00:10:02.015

but it, you need to have certain elements in place in order

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00:10:02.015 --> 00:10:03.295

to allow yourself to move.

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00:10:04.235 --> 00:10:05.975

And then you execute your test with rigor,

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00:10:06.915 --> 00:10:09.135

and then you execute your analysis

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00:10:09.135 --> 00:10:10.695

and your test reporting with rigor.

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00:10:11.755 --> 00:10:15.175

And then the last part is that continuous learning bit.

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00:10:15.175 --> 00:10:16.935

So you want to try and reintegrate everything

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00:10:16.935 --> 00:10:19.495

that you've learned through all your testing back into the

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00:10:19.495 --> 00:10:22.375

rest of your processes and get better at each iteration.

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00:10:22.715 --> 00:10:24.655

So that's the, those are the basic elements

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00:10:24.655 --> 00:10:25.735

that I broke it down into.

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00:10:25.915 --> 00:10:27.975

If you think about it, I probably missed something there,

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00:10:28.235 --> 00:10:30.135
and I'd be interested to hear your thoughts on that.

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00:10:30.155 --> 00:10:31.255
But those are my thoughts.

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00:10:33.625 --> 00:10:37.045
So what is the brilliance in a clear

233
00:10:37.065 --> 00:10:38.405
and realistic test plan?

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00:10:39.185 --> 00:10:42.085
And I apologize for reading out the list here,

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00:10:42.105 --> 00:10:44.325
but this is the best way I know how to, uh, sort

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00:10:44.325 --> 00:10:46.285
of just grab the, uh, elements.

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00:10:46.625 --> 00:10:48.525
And the idea is I'm hoping

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00:10:48.635 --> 00:10:51.765
that this will get your wheels turning.

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00:10:52.505 --> 00:10:54.405
No doubt I've missed something up here,

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00:10:54.425 --> 00:10:55.965
but I want to hear what you think.

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00:10:56.305 --> 00:11:00.525
Uh, this is the workshop portion of the, uh, of the, um, uh,

242
00:11:00.825 --> 00:11:02.365
or the tutorial part of the workshop.

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00:11:02.705 --> 00:11:05.045

So the idea is that there should be an exchange.

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00:11:05.155 --> 00:11:08.765

This, this is not a one way, uh, uh, description here,

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00:11:09.345 --> 00:11:12.485

but, uh, you gotta know the system under test

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00:11:13.025 --> 00:11:14.685

and the underlying technical theory.

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00:11:14.785 --> 00:11:19.165

In order to be able to design a a, a test properly, you have

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00:11:19.165 --> 00:11:21.085

to understand the system under test, right?

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00:11:21.425 --> 00:11:23.605

And all too often that is lost, right?

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00:11:23.905 --> 00:11:26.325

You would not believe the number of times that I've seen it,

251

00:11:26.325 --> 00:11:27.365

where, uh,

252

00:11:27.465 --> 00:11:30.765

we just get a test plan thrown over the fence and they have no idea.

253

00:11:31.465 --> 00:11:33.845

Uh, you know, they have described the system, and,

254

00:11:33.865 --> 00:11:34.925

and so you go, I, I,

255

00:11:35.005 --> 00:11:36.965

I don't know if this is an appropriate test or not.

256

00:11:37.625 --> 00:11:40.125

Uh, so that's where the system description

257
00:11:40.225 --> 00:11:42.365
and your system limitations come in

258
00:11:42.625 --> 00:11:44.285
and your test limitations come in.

259
00:11:44.505 --> 00:11:45.965
You gotta know those, right?

260
00:11:46.505 --> 00:11:49.645
Uh, required, uh, for, uh, proper, uh,

261
00:11:49.645 --> 00:11:50.845
test method and test hazard.

262
00:11:50.945 --> 00:11:53.445
If you, if you don't know, uh, the system,

263
00:11:53.585 --> 00:11:55.645
you can't understand the hazards that are there.

264
00:11:56.665 --> 00:12:00.205
Uh, so I say resist, throw it over the fence, uh,

265
00:12:00.475 --> 00:12:02.005
know why and know what.

266
00:12:02.825 --> 00:12:05.965
Uh, and then the buildup principle, that is the fundamental

267
00:12:05.965 --> 00:12:09.845
that I think test pilot school embeds in us all is the

268
00:12:09.875 --> 00:12:10.965
buildup principle.

269
00:12:11.265 --> 00:12:13.365
So you start from the lowest risk,

270
00:12:13.505 --> 00:12:16.445

and you progress to the highest risk in a very deliberate

271

00:12:16.445 --> 00:12:17.445
manner, right?

272

00:12:18.305 --> 00:12:21.315
Uh, always have an out, um,

273

00:12:22.015 --> 00:12:23.555
always have an out from a test point,

274

00:12:23.555 --> 00:12:24.795
especially if it's a test point.

275

00:12:24.795 --> 00:12:26.235
That's, uh, at an end point.

276

00:12:26.895 --> 00:12:28.485
Uh, leave yourself the out

277

00:12:29.065 --> 00:12:33.285
and, uh, know, not only know when you're gonna abort,

278

00:12:34.145 --> 00:12:37.005
but know how you're gonna abort, right?

279

00:12:38.145 --> 00:12:41.845
Uh, keep it simple. That's, that's one that comes up a lot.

280

00:12:42.185 --> 00:12:45.205
Uh, and, uh, break it down into manageable elements, uh,

281

00:12:46.015 --> 00:12:48.925
value, uh, a non advocate review.

282

00:12:49.785 --> 00:12:54.525
Um, some of the teams that are resource constrained, uh,

283

00:12:54.635 --> 00:12:58.685
they don't have, uh, a lot of experience on the teams,

284
00:12:59.875 --> 00:13:02.605
they can benefit from outside experience that comes in at,

285
00:13:02.665 --> 00:13:05.725
uh, at, at the right time, and give them advice

286
00:13:06.025 --> 00:13:07.285
and give them a pointer.

287
00:13:07.705 --> 00:13:10.605
Uh, and, uh, so if you're one of those smart small teams,

288
00:13:11.345 --> 00:13:14.725
my best recommendation is don't undervalue the idea

289
00:13:14.725 --> 00:13:16.965
of bringing somebody in from the outside and getting a look

290
00:13:16.965 --> 00:13:18.165
and telling you what you're doing wrong,

291
00:13:18.195 --> 00:13:20.965
because it's always a healthy thing, even for some

292
00:13:20.965 --> 00:13:22.485
of the bigger teams, that one will work.

293
00:13:25.935 --> 00:13:28.155
And then, uh, always ask yourself,

294
00:13:28.615 --> 00:13:30.835
is it legal and is it smart?

295
00:13:31.775 --> 00:13:34.515
And it, just because it's legal does not mean it's smart.

296
00:13:35.655 --> 00:13:38.075
Uh, and then make your risk decisions at the right level.

297
00:13:38.715 --> 00:13:41.235

A lot of companies, uh, you'll see, especially some

298

00:13:41.235 --> 00:13:42.715

of the smaller companies, the risk decisions

299

00:13:42.715 --> 00:13:43.795

are made at a low level.

300

00:13:44.455 --> 00:13:49.275

Uh, and, uh, there are some of those decisions, uh, ought

301

00:13:49.295 --> 00:13:51.475

to be made at a higher level

302

00:13:51.475 --> 00:13:54.635

because they have a tremendous impact on the, on the product

303

00:13:54.735 --> 00:13:56.195

and on the company's viability.

304

00:13:59.705 --> 00:14:01.485

Uh, train and prepare the team.

305

00:14:02.505 --> 00:14:04.365

So that's, uh, that's where they've,

306

00:14:04.505 --> 00:14:06.885

we gotta give them the time to understand the, uh,

307

00:14:06.885 --> 00:14:08.165

underlying technical theories

308

00:14:08.165 --> 00:14:11.365

and the technical skills, uh, understand the, uh, the test

309

00:14:11.365 --> 00:14:12.565

that you're about to do, and then

310

00:14:12.565 --> 00:14:13.645

make sure you develop that.

311

00:14:14.145 --> 00:14:15.165

Uh, a lot

312

00:14:15.165 --> 00:14:17.205

of us are resource the in resource screen

313

00:14:17.205 --> 00:14:18.525

efficiency and effectiveness.

314

00:14:18.525 --> 00:14:21.845

That's, that training often, uh, gets undervalued.

315

00:14:22.425 --> 00:14:23.805

Uh, expect the unexpected.

316

00:14:23.805 --> 00:14:26.125

That's something that we, we talk about all the time.

317

00:14:26.785 --> 00:14:28.805

Uh, develop critical skills, uh,

318

00:14:29.245 --> 00:14:30.365

critical decision making skills.

319

00:14:30.945 --> 00:14:34.365

So, uh, even though you've graduated from test pilot school,

320

00:14:34.425 --> 00:14:36.685

it doesn't mean that you've seen everything

321

00:14:36.875 --> 00:14:38.605

that could possibly happen.

322

00:14:38.665 --> 00:14:41.765

In fact, you're, you're really just, you, you, you know how

323

00:14:41.825 --> 00:14:44.085

to, uh, react

324

00:14:44.385 --> 00:14:47.685

and maybe come up with a recovery that, uh,

325

00:14:48.275 --> 00:14:50.885

that you didn't expect you'd ever have to, to execute.

326

00:14:51.305 --> 00:14:53.005

Um, but you know what's important,

327

00:14:53.185 --> 00:14:55.565

and you, you understand the trade off and the risks there.

328

00:14:55.905 --> 00:14:58.565

That's the benefit. But that you have to develop, that you,

329

00:14:58.745 --> 00:15:02.285

that's not something that you can just say at a, at a brief.

330

00:15:02.385 --> 00:15:03.645

And, and then that's embedded.

331

00:15:03.745 --> 00:15:06.365

You actually have to practice that skillset, um,

332

00:15:07.345 --> 00:15:09.525

bureau realistic about your, uh,

333

00:15:09.745 --> 00:15:12.605

and aware of your own capabilities and limitations.

334

00:15:12.605 --> 00:15:14.885

And that talks, that's, that's at the individual level

335

00:15:14.905 --> 00:15:16.285

and at the organization level.

336

00:15:16.785 --> 00:15:19.165

Uh, the organization has to be honest with itself

337

00:15:19.815 --> 00:15:22.045

about their capabilities and their limitations,

338
00:15:22.705 --> 00:15:24.925
and about what you know and about what you don't know.

339
00:15:26.425 --> 00:15:29.325
Uh, calibrate the hair on the back of your neck.

340
00:15:29.545 --> 00:15:31.565
Uh, this is where, uh, I like to talk.

341
00:15:31.645 --> 00:15:35.005
I, I say, develop your spidey senses and then, uh,

342
00:15:35.065 --> 00:15:36.805
and then listen to 'em when it tingles.

343
00:15:37.175 --> 00:15:39.565
Right? That's, there is something there.

344
00:15:40.025 --> 00:15:42.405
And you have to trust your gut instincts.

345
00:15:42.985 --> 00:15:45.805
Uh, some people have a three strike rule, right?

346
00:15:45.835 --> 00:15:47.245
I've seen that implemented really well.

347
00:15:47.245 --> 00:15:49.325
And, and, uh, particularly when you're doing a high risk

348
00:15:49.325 --> 00:15:51.005
test, if you get three things that go wrong,

349
00:15:51.755 --> 00:15:55.385
we're gonna stop for the day, reset, uh, rethink this thing,

350
00:15:55.605 --> 00:15:57.665
and, and start functioning when you're

351
00:15:57.665 --> 00:15:58.785

not under so much pressure.

352

00:16:00.005 --> 00:16:01.745

Uh, no vote.

353

00:16:01.925 --> 00:16:04.105

Um, if you're, if you're with the, uh, Navy

354

00:16:04.365 --> 00:16:07.785

and the Marine Corps, uh, system, the no vote is, is, uh,

355

00:16:08.045 --> 00:16:10.585

that's the term they use, where everybody's got the ability

356

00:16:10.685 --> 00:16:12.425

to stop an evolution, right?

357

00:16:12.445 --> 00:16:15.305

So you, you wanna make sure that, uh, there is a no vote.

358

00:16:15.305 --> 00:16:17.705

People know how to use it and when to use it, uh,

359

00:16:17.765 --> 00:16:19.185

and prepare the team to handle it.

360

00:16:19.445 --> 00:16:22.145

Uh, you also have to prepare how to recover from a no vote.

361

00:16:22.365 --> 00:16:25.945

So if somebody cast it all right, we're, we may stop,

362

00:16:26.485 --> 00:16:28.785

but now, how do you, how do you manage that

363

00:16:28.885 --> 00:16:31.625

and get back to flying, uh, with, you know,

364

00:16:31.625 --> 00:16:34.545

respecting the no vote and then respecting, uh, the ability

365

00:16:34.565 --> 00:16:36.225
or the requirement to get back

366

00:16:36.225 --> 00:16:38.745
and get some, some work done, uh,

367

00:16:39.065 --> 00:16:40.505
rehearse and maintain proficiency.

368

00:16:40.565 --> 00:16:41.585
That's kind of a no-brainer.

369

00:16:41.585 --> 00:16:44.505
But that's often one of the things that, uh, goes when it's,

370

00:16:44.605 --> 00:16:46.385
uh, particularly when you're resource constrained,

371

00:16:46.885 --> 00:16:48.065
uh, train as a team.

372

00:16:48.515 --> 00:16:49.905
Don't just send the pilot down there

373

00:16:49.905 --> 00:16:51.785
and say, Hey, just go ahead and rehearse your bit,

374

00:16:51.795 --> 00:16:54.465
especially if you've got a control room involved.

375

00:16:54.725 --> 00:16:57.385
Uh, you want to, you wanna rehearse the entire evolution

376

00:16:57.885 --> 00:16:59.105
as a team, uh,

377

00:16:59.365 --> 00:17:01.585
and make sure everybody knows when they're gonna speak

378

00:17:01.655 --> 00:17:05.465

what they're gonna say, uh, crew coordination, uh,

379

00:17:05.515 --> 00:17:08.545

throughout, uh, along with the, uh, the telemetry room.

380

00:17:09.435 --> 00:17:13.135

Uh, and then one of the things that always, uh,

381

00:17:13.265 --> 00:17:14.295

comes up when you're

382

00:17:14.325 --> 00:17:17.215

with these small companies is right size your

383

00:17:17.565 --> 00:17:18.855

processes, right?

384

00:17:19.835 --> 00:17:22.975

Uh, you don't, we don't have to have an entire nav,

385

00:17:22.975 --> 00:17:25.095

air library of process

386

00:17:25.595 --> 00:17:29.735

and, uh, to, to make a successful, uh, startup function.

387

00:17:30.395 --> 00:17:32.335

Uh, but we do have to have some.

388

00:17:32.635 --> 00:17:34.215

And, uh, you gotta right size it.

389

00:17:34.355 --> 00:17:37.015

And we, it's, it's a lot of fun in the early days

390

00:17:37.015 --> 00:17:38.495

with these startup companies.

391

00:17:38.575 --> 00:17:41.455

When you don't have, there's no rules, there's, you know,

392
00:17:41.675 --> 00:17:44.415
it, it, you know, you can, it's yours to form.

393
00:17:44.915 --> 00:17:46.615
Um, and things are going quick.

394
00:17:46.795 --> 00:17:49.285
People are making decisions, really, it's a small team.

395
00:17:49.555 --> 00:17:52.085
Everybody knows what's going on. That's fun.

396
00:17:52.815 --> 00:17:55.645
Where it really starts to get difficult is when they go,

397
00:17:55.645 --> 00:17:56.925
okay, we got a product now

398
00:17:56.925 --> 00:18:00.645
and we're trying to, uh, do things for a military contract,

399
00:18:00.665 --> 00:18:02.565
or we are trying to go through certification.

400
00:18:03.225 --> 00:18:05.685
And now suddenly you gotta start running through a bunch

401
00:18:05.685 --> 00:18:08.005
of process, and you have to track all that stuff.

402
00:18:08.585 --> 00:18:10.045
And, uh, and that's where you have

403
00:18:10.045 --> 00:18:11.725
to start building up your processes

404
00:18:11.725 --> 00:18:13.445
and getting ready for that certification.

405
00:18:14.265 --> 00:18:17.885

Uh, there is risk in being too flexible when you

406

00:18:17.885 --> 00:18:20.185
operate and too rigid.

407

00:18:20.565 --> 00:18:23.025
So you have to try and right size that process.

408

00:18:25.145 --> 00:18:27.605
And then you want clarity and roles and responsibilities.

409

00:18:27.625 --> 00:18:29.685
And I can't tell you how many times, uh,

410

00:18:29.795 --> 00:18:31.725
I've seen test teams, uh,

411

00:18:32.035 --> 00:18:34.285
that don't have a clear understanding

412

00:18:34.305 --> 00:18:36.325
of who's responsible for what.

413

00:18:36.945 --> 00:18:40.925
Uh, and, uh, and that leads just leads to confusion, uh,

414

00:18:40.985 --> 00:18:42.285
and it, and it impacts safety.

415

00:18:44.385 --> 00:18:47.585
And Then we talk about executing

416

00:18:47.585 --> 00:18:48.705
flight tests with rigor.

417

00:18:49.205 --> 00:18:51.665
Uh, plan the flight, fly the plan.

418

00:18:52.165 --> 00:18:55.185
Uh, that's, that's, uh, something that we say all the time.

419
00:18:55.565 --> 00:18:58.505
And, uh, and there's a lot of times when you'll see a, uh,

420
00:18:59.025 --> 00:19:01.425
a mishap incident that, uh, where they say, Hey,

421
00:19:01.425 --> 00:19:02.545
we deviated from the plan.

422
00:19:02.545 --> 00:19:04.745
That's that, that's the basic thing that we,

423
00:19:05.285 --> 00:19:06.985
uh, that we did wrong.

424
00:19:07.645 --> 00:19:09.105
Um, and, uh,

425
00:19:09.685 --> 00:19:12.265
and then I think in, uh, wicker's paper, which I'll talk

426
00:19:12.265 --> 00:19:13.705
to you here in a minute, but that's, that,

427
00:19:13.705 --> 00:19:14.825
that's resist drift.

428
00:19:15.125 --> 00:19:17.225
You know that the idea is resist the drift.

429
00:19:17.725 --> 00:19:19.705
Uh, so if you're under pressure, uh,

430
00:19:20.045 --> 00:19:23.025
and you, you feel like you're getting pushed, uh, you have

431
00:19:23.025 --> 00:19:25.745
to be aware of that, uh, brief execute

432
00:19:25.745 --> 00:19:27.385

and debrief like your livelihood

433

00:19:27.485 --> 00:19:30.305

or your life depends on it, because it does.

434

00:19:31.725 --> 00:19:33.585

Uh, and then listen to your instincts.

435

00:19:33.585 --> 00:19:36.865

Trust but verify, uh, avoid real time changes

436

00:19:36.925 --> 00:19:38.665

to the test plan that introduce risk.

437

00:19:39.325 --> 00:19:42.755

And then if you do need to make a change, take the time

438

00:19:42.855 --> 00:19:46.555

to stop, pause, communicate to somebody that's outside the,

439

00:19:46.735 --> 00:19:48.595

uh, sort of pressure bubble that you're in.

440

00:19:48.905 --> 00:19:50.115

Make sure that it's the right thing,

441

00:19:50.115 --> 00:19:51.755

and make those decisions at the right level.

442

00:19:52.495 --> 00:19:54.635

Uh, and then just because you've done it

443

00:19:54.635 --> 00:19:57.565

before, uh, does not mean it's gonna turn out

444

00:19:57.565 --> 00:19:59.815

to be the same this time.

445

00:20:00.355 --> 00:20:03.375

And that's, uh, particularly important when you're talking

446
00:20:03.375 --> 00:20:04.895
about edge of the envelope stuff.

447
00:20:05.475 --> 00:20:08.735
Uh, every time you, uh, hit that v

448
00:20:08.735 --> 00:20:11.415
and e point, every time you hit that V dive point,

449
00:20:12.385 --> 00:20:15.755
it's not guaranteed to be the same time, uh, the same thing

450
00:20:15.825 --> 00:20:17.635
that you, that you experienced the first,

451
00:20:18.255 --> 00:20:19.555
the first time you're there.

452
00:20:19.775 --> 00:20:23.875
So be cautious. Uh, and then treat surprises as warnings.

453
00:20:23.875 --> 00:20:26.195
That's another, uh, sort of wicker, um,

454
00:20:26.765 --> 00:20:28.115
basic, uh, brilliance.

455
00:20:32.135 --> 00:20:35.315
And then rigor in our test, uh, analysis and test reporting.

456
00:20:35.815 --> 00:20:38.115
Uh, you gotta resist throwing

457
00:20:38.115 --> 00:20:40.355
that data back over the fence at engineering

458
00:20:40.615 --> 00:20:43.355
and not understanding the, uh, the data analysis.

459
00:20:43.455 --> 00:20:46.195

So that's a, that's a common thing where everybody's rushing

460

00:20:46.195 --> 00:20:47.405

and they, okay, we got the data.

461

00:20:47.595 --> 00:20:49.325

Just, you know, hand it to engineering,

462

00:20:49.325 --> 00:20:50.365

and then we're gonna press and,

463

00:20:50.385 --> 00:20:52.325

and then, uh, you want to make sure

464

00:20:52.325 --> 00:20:54.525

that you've taken the time, especially if it's something

465

00:20:54.525 --> 00:20:59.005

that, uh, affects risks, verify that the analysis, uh, was

466

00:20:59.075 --> 00:21:01.045

what you believe it, it, uh, should be.

467

00:21:01.385 --> 00:21:04.365

Uh, and then that's, again, another trust, but verify, uh,

468

00:21:04.665 --> 00:21:06.205

and then reporting without bias.

469

00:21:06.905 --> 00:21:09.045

So we're humans, we're emotional.

470

00:21:09.345 --> 00:21:11.005

Uh, we get tied to our ideas,

471

00:21:11.505 --> 00:21:14.485

but it's really important that we report without bias.

472

00:21:14.955 --> 00:21:17.725

It's good for the organization, it's good for flight test,

473

00:21:17.785 --> 00:21:20.245

and it's good for, uh, inside of an organization.

474

00:21:20.715 --> 00:21:22.925

Your, your company just needs to, uh, trust

475

00:21:22.925 --> 00:21:24.605

that you're gonna report without bias.

476

00:21:25.225 --> 00:21:28.805

Um, and then, uh, capture your lessons learned

477

00:21:28.805 --> 00:21:30.885

and work to percolate that new knowledge, uh,

478

00:21:30.885 --> 00:21:32.725

throughout the, uh, information

479

00:21:33.185 --> 00:21:35.525

or, uh, throughout the organization,

480

00:21:41.215 --> 00:21:42.995

And then down to the continuous learning bit.

481

00:21:43.615 --> 00:21:45.435

So, know yourself and seek self-improvement.

482

00:21:45.435 --> 00:21:48.755

So that's my, my favorite, uh, Marine Corps leadership, um,

483

00:21:49.545 --> 00:21:52.995

principle, uh, that, that goes for the yourself,

484

00:21:52.995 --> 00:21:54.435

your team, and your organization.

485

00:21:55.015 --> 00:21:56.875

Uh, and then there is risk

486

00:21:57.765 --> 00:22:00.665

in being a self looking ice cream cone walking around,

487

00:22:00.665 --> 00:22:02.545

always telling yourself how good you are, right?

488

00:22:02.885 --> 00:22:04.945

So don't, don't take yourself too seriously.

489

00:22:05.245 --> 00:22:06.865

Uh, be critical. Um,

490

00:22:07.445 --> 00:22:09.465

you can never be certain if you're lucky

491

00:22:09.485 --> 00:22:12.825

or good, uh, until an accident exposes the lack

492

00:22:12.825 --> 00:22:16.065

of risk awareness, uh, another wicker, uh, sort

493

00:22:16.065 --> 00:22:17.265

of brilliance in the basics here.

494

00:22:17.805 --> 00:22:20.345

Uh, and then a healthy respect for the finer elements

495

00:22:20.345 --> 00:22:22.225

of the craft and the network, uh,

496

00:22:22.485 --> 00:22:23.785

of the industry professionals.

497

00:22:23.845 --> 00:22:26.385

So, understanding that there's lots of experience out there.

498

00:22:26.695 --> 00:22:28.905

Your team may not, uh, necessarily have it,

499

00:22:28.905 --> 00:22:31.745

but it is available, uh, in many different forms,

500

00:22:32.245 --> 00:22:33.785

uh, this being one of them.

501

00:22:34.525 --> 00:22:36.705

Uh, and then attend the flight test safety workshop.

502

00:22:37.085 --> 00:22:38.785

Uh, that'll, uh, that shall,

503

00:22:38.815 --> 00:22:40.345

that will help, uh, do the trick.

504

00:22:40.685 --> 00:22:43.825

Uh, culture is what makes a great team.

505

00:22:43.885 --> 00:22:45.865

So we just need to understand that.

506

00:22:45.925 --> 00:22:49.665

And in that culture, if you do have that incident, there's,

507

00:22:49.665 --> 00:22:52.665

there's resilience if you have a good culture, right?

508

00:22:52.845 --> 00:22:55.425

That's how a, a good team will recover,

509

00:22:56.285 --> 00:22:57.305

is through their culture.

510

00:22:58.165 --> 00:23:00.825

Uh, and then that relentless, uh, pursuit

511

00:23:00.845 --> 00:23:02.105

of flight test excellence.

512

00:23:05.065 --> 00:23:07.805

So, a couple of other key concepts that I wanted to, uh,

513

00:23:07.875 --> 00:23:09.365

sort of set up, uh,

514

00:23:09.705 --> 00:23:12.525

and then if has, has anybody read the wicked paper?

515

00:23:13.025 --> 00:23:15.205

Uh, so, uh, Colonel Wicker, uh,

516

00:23:15.705 --> 00:23:18.045

and raise of hands here real quick, just so, okay.

517

00:23:18.045 --> 00:23:20.085

So there's probably maybe, uh, 10

518

00:23:20.085 --> 00:23:22.245

or 12 people in here that have, uh, read the paper.

519

00:23:23.235 --> 00:23:27.045

It's probably the best paper I've ever read on, uh, safety

520

00:23:27.105 --> 00:23:28.485

and, and risk management.

521

00:23:28.485 --> 00:23:31.685

Risk awareness. Uh, so it's a really high level PhD level,

522

00:23:32.065 --> 00:23:33.485

uh, paper, but it's got some

523

00:23:33.535 --> 00:23:35.205

tremendous brilliance built into it.

524

00:23:35.205 --> 00:23:36.685

So if you have not read that paper,

525

00:23:36.845 --> 00:23:37.925

I encourage you to do so.

526

00:23:38.665 --> 00:23:41.285

Uh, and then one of the key concepts that comes out

527

00:23:41.285 --> 00:23:46.005
of the wicker paper is this idea of,

528

00:23:46.265 --> 00:23:49.005
uh, complexity and the relationship with, uh,

529

00:23:49.005 --> 00:23:50.205
knowledge and certainty.

530

00:23:51.105 --> 00:23:54.525
So, uh, you've got this, this graph here, uh,

531

00:23:54.865 --> 00:23:58.365
and, uh, there's this area, uh, where you've got, uh,

532

00:23:58.365 --> 00:23:59.805
low variability and high knowledge,

533

00:24:00.105 --> 00:24:02.285
and it, there's, uh, some certainty in there.

534

00:24:03.305 --> 00:24:06.485
Uh, and then there's these other areas, uh, if

535

00:24:06.715 --> 00:24:09.365
that he defines as ignorance, um,

536

00:24:09.585 --> 00:24:11.965
and there's low knowledge, uh,

537

00:24:12.145 --> 00:24:13.885
and then maybe even high variability.

538

00:24:14.745 --> 00:24:17.005
And so the systems that we're testing

539

00:24:17.535 --> 00:24:19.725
today are highly complex

540

00:24:21.015 --> 00:24:24.515

and, uh, complex systems bring,

541

00:24:25.065 --> 00:24:28.035

it's really difficult to, to have high knowledge

542

00:24:28.035 --> 00:24:29.715

with these super complex systems.

543

00:24:29.855 --> 00:24:33.795

And so that's breeds uncertainty, and that breeds risk.

544

00:24:34.175 --> 00:24:38.595

Uh, and so the idea is, is that you want to, id,

545

00:24:39.985 --> 00:24:41.925

uh, the nature of your unknowns.

546

00:24:42.145 --> 00:24:44.885

So in your risk process, you want to try

547

00:24:44.885 --> 00:24:47.205

and understand what you know and what you don't know, what,

548

00:24:47.265 --> 00:24:51.325

and, uh, what, where you're guessing really, uh, in terms of

549

00:24:51.425 --> 00:24:53.245

how, uh, the probability of a failure.

550

00:24:54.185 --> 00:24:56.125

And then you want to, as much as you can,

551

00:24:56.785 --> 00:24:58.885

reduce the reduceable ignorance.

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00:25:00.105 --> 00:25:02.925

So you have to take the time to reduce that ignorance,

553

00:25:03.115 --> 00:25:05.605

analyze your, your risks, uh,

554

00:25:06.025 --> 00:25:08.925

and then be cautious of your cognitive biases.

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00:25:09.825 --> 00:25:12.965

So he talks about, uh, illusions where you believe

556

00:25:12.965 --> 00:25:15.165

that you're working in the realm of certainty,

557

00:25:16.185 --> 00:25:18.765

and you're actually functioning in the realm of

558

00:25:19.275 --> 00:25:20.325

pure uncertainty,

559

00:25:21.145 --> 00:25:22.765

or the idea that you believe

560

00:25:22.765 --> 00:25:25.245

that you're working in the realm of pure uncertainty,

561

00:25:25.245 --> 00:25:27.285

and you're actually in the random uncertainty.

562

00:25:27.285 --> 00:25:29.485

You're, you're in the, the highest risk area.

563

00:25:30.745 --> 00:25:35.395

So, uh, so that's a, that's a, a great paper and,

564

00:25:35.615 --> 00:25:38.955

and some real brilliance in the way he presented it.

565

00:25:39.015 --> 00:25:43.895

And it that I think dovetailed with our traditional risk,

566

00:25:44.155 --> 00:25:47.455

uh, uh, analysis approach, you know,

567

00:25:47.455 --> 00:25:49.295

that you'd find in the 40, 40, 26,

568

00:25:49.635 --> 00:25:52.815

or any of the, uh, military instructions,

569

00:25:53.475 --> 00:25:55.895

if you overlay those two things, I, I, to me,

570

00:25:55.925 --> 00:25:59.175

it's a two phase approach now, uh, with this new system

571

00:25:59.205 --> 00:26:00.775

that, uh, Wicker offered.

572

00:26:02.235 --> 00:26:04.375

And then he also offered this diagram here,

573

00:26:04.375 --> 00:26:08.705

which I think illustrates, uh, really well, the idea

574

00:26:08.705 --> 00:26:10.745

that you've got, uh, everybody's got,

575

00:26:10.745 --> 00:26:11.905

there's always pressure, right?

576

00:26:11.965 --> 00:26:14.545

So, uh, in flight test, uh, we're trying

577

00:26:14.545 --> 00:26:16.065

to develop a product, we're trying

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00:26:16.065 --> 00:26:17.465

to be safe, efficient, and effective.

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00:26:17.685 --> 00:26:21.025

Uh, but there's always gonna be pressure, uh, to perform.

580

00:26:21.405 --> 00:26:25.065

So you've got time and, uh, program office delays

581
00:26:25.245 --> 00:26:28.865
and resource, uh, constraints that are pushing you towards,

582
00:26:29.565 --> 00:26:32.025
uh, those unknowns.

583
00:26:32.805 --> 00:26:36.425
Uh, and then if you actually couple all that with

584
00:26:37.095 --> 00:26:39.025
uncertainty and complex systems,

585
00:26:39.085 --> 00:26:42.505
that's gonna impress you into that region that's, uh,

586
00:26:42.705 --> 00:26:44.045
identified as a, as a mishap.

587
00:26:44.785 --> 00:26:48.685
So, so Wicker teaches us to resist drift,

588
00:26:49.745 --> 00:26:51.925
resist that if you recognize it, if you,

589
00:26:51.925 --> 00:26:54.845
if you've got this idea in your head, you can,

590
00:26:54.945 --> 00:26:58.405
you can probably recognize it better, uh, when it happens.

591
00:26:59.025 --> 00:27:00.245
So he says, resist drift.

592
00:27:01.585 --> 00:27:05.925
And then he also says, democratize safety, uh, which is, is,

593
00:27:05.985 --> 00:27:10.045
is a, a great idea, uh, where knowledge

594
00:27:10.045 --> 00:27:13.645

and information about uncertainty are freely, uh,

595

00:27:13.915 --> 00:27:16.645

percolating throughout the, the organization.

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00:27:16.665 --> 00:27:18.965

And so this idea is not just for flight testers,

597

00:27:18.965 --> 00:27:20.125

that's kind of the point.

598

00:27:20.595 --> 00:27:22.925

This idea is for the whole organization.

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00:27:23.065 --> 00:27:25.205

So you have to maybe take the time

600

00:27:25.205 --> 00:27:28.125

to teach your organization about this concept

601

00:27:28.345 --> 00:27:30.925

and about the way uncertainty, uh,

602

00:27:30.985 --> 00:27:34.205

for these complex systems can creep in and, and drive risk.

603

00:27:34.825 --> 00:27:39.765

Uh, so if you do that, then the, the information can,

604

00:27:39.825 --> 00:27:42.125

uh, percolate throughout the organization,

605

00:27:42.145 --> 00:27:45.045

and that's what I call effective communication, right?

606

00:27:45.425 --> 00:27:48.285

And one of the things, I think it's almost universal.

607

00:27:48.545 --> 00:27:52.165

Any, any organization in the room, you'd be able to say,

608
00:27:52.165 --> 00:27:53.245
Hey, what's something you can improve?

609
00:27:53.245 --> 00:27:54.405
And communication is something

610
00:27:54.405 --> 00:27:56.125
that we can always improve upon.

611
00:27:57.665 --> 00:28:02.645
Uh, and then advise your decision makers when you get that,

612
00:28:02.945 --> 00:28:05.525
uh, when you get to the point where

613
00:28:05.635 --> 00:28:10.565
that pressure is driving you towards, uh, the, uh,

614
00:28:10.745 --> 00:28:13.165
the boundary, uh, and uncertainty.

615
00:28:18.625 --> 00:28:20.405
And so that's what I have to offer.

616
00:28:20.885 --> 00:28:22.725
I I do, I could take questions now.

617
00:28:22.725 --> 00:28:25.205
We're gonna do a panel here in just a little while,

618
00:28:25.745 --> 00:28:29.085
but I'm really more interested at this point.

619
00:28:29.445 --> 00:28:31.325
'cause I, I know that was not an exhaustive list.

620
00:28:31.685 --> 00:28:33.365
I, I, hopefully it got your wheels turning,

621
00:28:33.665 --> 00:28:37.325

but I'm interested to hear what you think about what the,

622

00:28:37.545 --> 00:28:41.685

the basics are and where the brilliance elements might be.

623

00:28:43.895 --> 00:28:48.875

So any questions or comments? Crickets.

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00:28:49.955 --> 00:28:52.475

Crickets. Yeah. Yes, sir. Yeah. Um,

625

00:28:52.945 --> 00:28:54.145

When I was,

626

00:28:57.845 --> 00:29:01.945

bill the organization, help them, right?

627

00:29:02.865 --> 00:29:07.685

And the, I think the key, a lot of good points here,

628

00:29:07.805 --> 00:29:08.885

everything's valid,

629

00:29:09.625 --> 00:29:13.125

but the real key is all that stuff needs to be present.

630

00:29:13.385 --> 00:29:17.095

And if from day one, the

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00:29:17.955 --> 00:29:20.155

new organization, you walk into an organization

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00:29:20.155 --> 00:29:23.035

That's already got their own little culture, uh,

633

00:29:23.035 --> 00:29:25.075

these guys had already, oh, boy,

634

00:29:26.125 --> 00:29:28.475

these guys had already crashed two vehicles.

635

00:29:29.945 --> 00:29:32.885

And to institute this type of stuff,

636

00:29:32.945 --> 00:29:34.765

you get resistance like you wouldn't believe.

637

00:29:35.105 --> 00:29:36.685

So it's gotta be part of the, uh,

638

00:29:37.265 --> 00:29:39.485

organizational culture from day one.

639

00:29:40.275 --> 00:29:42.165

Yeah, that's great. I, I think it's a good point.

640

00:29:42.325 --> 00:29:47.045

I think culture is king, right? I mean, it always is.

641

00:29:47.865 --> 00:29:52.365

Uh, and it's, if you start out with a bad culture, that's,

642

00:29:52.365 --> 00:29:54.565

it's a challenging thing to course correct.

643

00:29:55.345 --> 00:29:58.365

Uh, so I agree that the a hundred percent, the culture has

644

00:29:58.365 --> 00:29:59.765

to be right from the beginning.

645

00:30:00.345 --> 00:30:04.295

Uh, now a good culture, uh,

646

00:30:04.675 --> 00:30:08.935

and maybe lacking processes you can recover, right?

647

00:30:09.475 --> 00:30:11.895

Uh, but if you've got a bad culture

648

00:30:12.435 --> 00:30:15.215

and bad processes, you're, you got a long, uh,

649

00:30:15.295 --> 00:30:16.295

a long road ahead of you.

650

00:30:16.755 --> 00:30:19.095

So, uh, I, I agree with you, sir.

651

00:30:22.325 --> 00:30:25.975

Anybody else? I can add something. Yeah. Marty,

652

00:30:27.175 --> 00:30:29.895

I don't know if, I don't know if anybody had a chance

653

00:30:29.895 --> 00:30:31.735

to look at the newsletter that went out,

654

00:30:31.835 --> 00:30:35.135

the flight test safety fact newsletter recently.

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00:30:35.565 --> 00:30:39.375

Mark Jones was asking, uh, can you list three principles,

656

00:30:39.845 --> 00:30:42.735

basically that cover flight test?

657

00:30:43.195 --> 00:30:47.655

And he, he put it in the terms of head, hands, and heart.

658

00:30:48.515 --> 00:30:50.255

And I started thinking about that, and,

659

00:30:50.675 --> 00:30:53.135

and it kind of fits in what, with what we're talking about.

660

00:30:53.275 --> 00:30:55.055

For me, the head part was

661

00:30:56.175 --> 00:31:00.055

building an effective risk mitigation plan, um,

662

00:31:00.685 --> 00:31:03.855

that the hands is putting together a team

663

00:31:04.995 --> 00:31:09.135

and maintaining that team, a professional team of testers

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00:31:09.135 --> 00:31:11.215

that can execute that risk mitigation plan.

665

00:31:11.755 --> 00:31:15.255

And then the heart was promoting a culture

666

00:31:15.405 --> 00:31:17.295

that supports those first two things.

667

00:31:18.035 --> 00:31:20.215

And so, and democratizes safety.

668

00:31:20.445 --> 00:31:22.655

Yeah, that's Great. I think those three things,

669

00:31:22.875 --> 00:31:24.775

if you got all those working, you're there.

670

00:31:25.085 --> 00:31:27.455

It's just, and then you break 'em down into

671

00:31:27.455 --> 00:31:29.295

what you've done here with the components.

672

00:31:30.075 --> 00:31:32.495

And, um, I'm gonna talk about

673

00:31:32.495 --> 00:31:35.095

that first one in my briefing next,

674

00:31:35.305 --> 00:31:38.015

which is the risk mitigation part.

675

00:31:39.115 --> 00:31:41.775

Um, anybody else?

676

00:31:43.935 --> 00:31:45.075

So I'll offer this also.

677

00:31:45.215 --> 00:31:48.595

Uh, one of the things that, that, uh, Wicker taught us in,

678

00:31:48.595 --> 00:31:53.555

in his paper is, uh, that when you get to

679

00:31:54.275 --> 00:31:59.055

a highly complex system where, uh,

680

00:31:59.405 --> 00:32:02.735

risk is a function of knowledge

681

00:32:03.315 --> 00:32:05.975

or, uh, that you're often,

682

00:32:06.075 --> 00:32:09.495

or the lack of, uh, that you're often better off

683

00:32:09.495 --> 00:32:12.855

with heuristics to, to drive your

684

00:32:13.415 --> 00:32:14.575

analysis of the situation.

685

00:32:14.635 --> 00:32:17.055

And so the real question becomes then

686

00:32:17.565 --> 00:32:19.175

what are the heuristics, right?

687

00:32:19.755 --> 00:32:20.975

Uh, what, what does that mean?

688

00:32:21.355 --> 00:32:26.335

And that's where the idea of keep it simple, uh, you know,

689
00:32:26.555 --> 00:32:29.895
uh, outliers are information, uh, you know,

690
00:32:29.895 --> 00:32:31.575
don't just throw out your outliers.

691
00:32:31.575 --> 00:32:34.855
There's, there's a whole series of heuristics that I'm,

692
00:32:34.915 --> 00:32:36.175
I'm really interested to try

693
00:32:36.175 --> 00:32:38.495
and get into the brains of everybody in this room

694
00:32:39.185 --> 00:32:40.205
and pull those out,

695
00:32:40.205 --> 00:32:41.485
because there's gotta be some,

696
00:32:41.795 --> 00:32:43.565
some real nuggets of gold there.

697
00:32:44.865 --> 00:32:46.245
So, another question. Yes, sir.

698
00:32:46.945 --> 00:32:51.165
I'm wondering about often it's easy once you have a bunch

699
00:32:51.165 --> 00:32:52.845
of experience to state immoral,

700
00:32:52.845 --> 00:32:54.605
and everyone with experience is like, oh, yeah,

701
00:32:54.805 --> 00:32:55.845
I have learned that too.

702
00:32:56.275 --> 00:32:59.925

Yeah. How do you bring it back to a new team?

703

00:33:00.025 --> 00:33:03.205

And especially in a startup where often it's like the,

704

00:33:03.225 --> 00:33:06.685

the mentality is we're gonna do it fast

705

00:33:06.685 --> 00:33:07.805

and dirty, we're gonna do it quicker

706

00:33:07.805 --> 00:33:09.045

than a big company could.

707

00:33:09.065 --> 00:33:11.565

And like, besides, trust me, I've done this before.

708

00:33:11.665 --> 00:33:15.165

How do you teach the morals without just,

709

00:33:15.915 --> 00:33:16.915

Yeah. So I'm

710

00:33:16.915 --> 00:33:17.685

really glad you're here.

711

00:33:17.685 --> 00:33:18.885

Are you with a startup, by the way?

712

00:33:19.105 --> 00:33:21.045

Not currently, or A small company? Okay. Yeah.

713

00:33:21.145 --> 00:33:22.645

So, uh, but I, I hear you.

714

00:33:22.985 --> 00:33:25.405

Uh, I think the, the answer is

715

00:33:26.135 --> 00:33:28.645

bring in some experience at the right time.

716
00:33:28.985 --> 00:33:32.325
So I'm, I'm, you know, I, I show up at a, uh, you know,

717
00:33:32.325 --> 00:33:33.365
maybe a new startup,

718
00:33:33.465 --> 00:33:36.845
and I'm the old guy that, uh, you know, nobody, I mean,

719
00:33:36.905 --> 00:33:40.005
you know, just with the, I happen to have some experience,

720
00:33:40.225 --> 00:33:41.565
but I'm the old guy, and they're like, ah,

721
00:33:41.745 --> 00:33:42.925
you know, you don't know how to code.

722
00:33:42.925 --> 00:33:44.405
You don't know how to do this, uh, whatever.

723
00:33:44.705 --> 00:33:47.925
And, uh, but I, I know my way around, uh, the aircraft and,

724
00:33:47.945 --> 00:33:49.605
and the risk space a little bit, right?

725
00:33:50.105 --> 00:33:54.365
So you have to just maybe bring in some, uh, some experience

726
00:33:54.625 --> 00:33:58.765
and, and, you know, listen, glean what you can, uh,

727
00:33:59.425 --> 00:34:02.645
and, uh, the healthiest in, uh, organizations,

728
00:34:02.645 --> 00:34:04.445
especially when they're small, like I talked about,

729
00:34:04.445 --> 00:34:05.525

that non advocate review.

730

00:34:05.745 --> 00:34:07.085

So you get some outside reviewers.

731

00:34:07.085 --> 00:34:09.445

I'm, I'm with a company called Pivotal right now, uh,

732

00:34:09.705 --> 00:34:13.765

and Pivotal makes a, uh, part 1 0 3,

733

00:34:14.955 --> 00:34:16.975

uh, e vtal aircraft.

734

00:34:17.005 --> 00:34:19.735

It's the only one in the country that is sold,

735

00:34:19.835 --> 00:34:22.215

is actually sold to, uh, we've got customers

736

00:34:22.215 --> 00:34:23.855

that own their own, uh,

737

00:34:23.855 --> 00:34:25.575

what we call black fly aircraft, right?

738

00:34:25.875 --> 00:34:29.215

Single seat, uh, the whole aircraft tilts.

739

00:34:29.635 --> 00:34:33.535

Um, and, uh, it's, it's part 1 0 3 compliant,

740

00:34:33.535 --> 00:34:36.015

which is amazing that you can do that in, uh,

741

00:34:37.075 --> 00:34:38.815

and actually create a product.

742

00:34:39.395 --> 00:34:44.215

Um, and then, uh, it's a small team, right?

743

00:34:44.235 --> 00:34:47.775

So what do we do? We have a board, a safety review board

744

00:34:47.985 --> 00:34:49.895

where we have outsiders all the time.

745

00:34:50.235 --> 00:34:52.855

You know, ed Lou is, uh, an an astronaut.

746

00:34:52.995 --> 00:34:56.135

Uh, we've got some, some other real heavy hitting, uh,

747

00:34:56.315 --> 00:34:57.615

uh, sort of experience.

748

00:34:57.615 --> 00:34:59.975

And then every once in a while we'll have, uh, a monthly

749

00:35:00.035 --> 00:35:02.255

or a quarterly, uh, safety review board.

750

00:35:02.255 --> 00:35:03.735

We'll talk about the issues we're challenging with,

751

00:35:03.735 --> 00:35:05.455

and they'll give us some rudder steers, right?

752

00:35:06.075 --> 00:35:10.255

Uh, I've also seen companies, small startup companies, uh,

753

00:35:10.325 --> 00:35:11.415

that were doing something.

754

00:35:11.795 --> 00:35:14.775

In fact, this aircraft right here, uh, was, uh, an aircraft

755

00:35:14.775 --> 00:35:18.095

that I flew when the company was called Z Aero, sort

756

00:35:18.095 --> 00:35:21.015

of progressed and grew into what is now Whisk.

757

00:35:21.595 --> 00:35:24.375

Uh, but that aircraft right there, when we decided

758

00:35:24.375 --> 00:35:27.055

that we were gonna, uh, start flying it

759

00:35:27.215 --> 00:35:29.695

with the Vertical Propulsion System, uh,

760

00:35:30.935 --> 00:35:32.635

we brought in some outside reviewers.

761

00:35:32.635 --> 00:35:37.605

We brought in, uh, uh, is it, uh, the, the guy

762

00:35:37.605 --> 00:35:39.285

who I, I can't recall the name right now,

763

00:35:39.285 --> 00:35:42.005

but it was a FFX 35 guy, uh,

764

00:35:42.275 --> 00:35:44.365

hovered the X 35 for the first time.

765

00:35:44.905 --> 00:35:47.485

Uh, we brought in V 22 experience.

766

00:35:47.485 --> 00:35:51.885

We brought in, uh, uh, a couple other people from, uh, uh,

767

00:35:51.985 --> 00:35:53.005

scaled Composites,

768

00:35:53.665 --> 00:35:55.805

and we gave them, we, we called it a summit.

769

00:35:56.145 --> 00:35:59.045

And we just said, here's everything. Op open kimono.

770
00:35:59.065 --> 00:36:00.765
You get to see everything that we're doing.

771
00:36:00.785 --> 00:36:02.685
Here's all the assumptions we're making, here's

772
00:36:02.685 --> 00:36:04.165
how we're looking at the systems

773
00:36:04.825 --> 00:36:06.845
and, uh, tell us if we're crazy.

774
00:36:07.135 --> 00:36:09.725
Right? And, uh, so you have to have that open mindset.

775
00:36:09.865 --> 00:36:13.245
If you're a one of the startups that is like, Nope, not,

776
00:36:13.465 --> 00:36:15.085
I'm not gonna share my information,

777
00:36:15.145 --> 00:36:16.405
and you're not gonna invite that.

778
00:36:16.785 --> 00:36:19.565
You're gonna miss out on the opportunity to actually learn.

779
00:36:19.785 --> 00:36:21.765
So, so I, it's back to culture.

780
00:36:22.145 --> 00:36:24.485
You have to have a culture within the company

781
00:36:24.515 --> 00:36:27.965
that allows you to be mature enough to bring in people

782
00:36:27.985 --> 00:36:30.885
and take maybe, you know, somebody's gonna tell you

783
00:36:30.885 --> 00:36:32.485

that you're doing it wrong, you don't have

784

00:36:32.485 --> 00:36:35.325

to change anything, but it, it's an opportunity to learn.

785

00:36:35.425 --> 00:36:37.845

So if you don't afford yourself that opportunity, it's that

786

00:36:37.845 --> 00:36:39.285

that's just an indicator of your culture.

787

00:36:42.085 --> 00:36:43.085

There's One right here.

788

00:36:44.115 --> 00:36:45.515

I I, I'm curious, uh,

789

00:36:47.025 --> 00:36:49.765

I'm curious, how many of you know about the Con

790

00:36:49.765 --> 00:36:50.885

Nevin diagrams?

791

00:36:54.115 --> 00:36:56.685

Alright, I'll offer this. I will talk to that.

792

00:36:57.305 --> 00:36:58.525

One of the best talks

793

00:36:58.525 --> 00:37:01.605

that we had in a flight test safety workshop on the bin

794

00:37:01.605 --> 00:37:04.885

diagrams was in, at the London Flight Test Safety workshop.

795

00:37:05.585 --> 00:37:09.965

And to your what, uh, beaker wicker's, uh, uh, quadrant.

796

00:37:10.505 --> 00:37:15.125

Uh, there is, uh, several addition to talk, uh,

797

00:37:15.235 --> 00:37:18.205
outstanding paper on the risk

798

00:37:18.305 --> 00:37:20.445
and random uncertainty and complexity.

799

00:37:20.905 --> 00:37:22.605
And I'm wondering if you've heard of this.

800

00:37:22.825 --> 00:37:25.405
It was by Bob Barum, a fellow at Lockheed Martin

801

00:37:26.145 --> 00:37:28.085
and Star Hughes, who's now a VP there.

802

00:37:28.465 --> 00:37:31.325
And they wrote Why Flight Test is distinctly different,

803

00:37:31.325 --> 00:37:32.885
and they used the Conne diagram,

804

00:37:33.865 --> 00:37:37.125
and when I gave the paper to Beaker Wicker, he said, Hey,

805

00:37:37.125 --> 00:37:38.845
they explained it a lot better than I ever did,

806

00:37:39.145 --> 00:37:42.525
and it was written three years before Beaker Wicker's paper,

807

00:37:43.265 --> 00:37:45.085
and if you just join SFTE

808

00:37:45.385 --> 00:37:47.765
or me, you can see the paper and read it.

809

00:37:47.865 --> 00:37:50.485
That's great. So, so I, I wondered if you had heard about

810

00:37:50.485 --> 00:37:52.045

that paper or the Canne diagram?

811

00:37:52.405 --> 00:37:54.965

I have not heard of it, but, uh, yeah, I'll, I'll look it

812

00:37:54.965 --> 00:37:55.965

Up. I, I'll I'll talk to

813

00:37:55.965 --> 00:37:57.005

it a little bit more tomorrow.

814

00:37:57.425 --> 00:38:01.485

That's great. But just very, very, uh, shortly, so for

815

00:38:01.485 --> 00:38:05.345

that, yeah.

816

00:38:11.895 --> 00:38:14.225

All right. We got one more back here.

817

00:38:17.005 --> 00:38:20.625

Hey, uh, Nathan Cook. Check, check, check.

818

00:38:22.505 --> 00:38:24.705

Sance siblings, check one. There we go.

819

00:38:25.845 --> 00:38:30.105

Nathan Cook, uh, with EPIs, I now, um, one

820

00:38:30.105 --> 00:38:34.185

of the things I've, uh, discovered about influence

821

00:38:34.885 --> 00:38:37.405

influencing culture, uh, there's the official culture

822

00:38:37.825 --> 00:38:39.325

and there's the actual culture.

823

00:38:40.305 --> 00:38:42.885

Uh, there's the official decision makers,

824

00:38:42.885 --> 00:38:44.645
and there's the actual decision makers.

825

00:38:45.305 --> 00:38:49.045
So you might think that you are discussing things

826

00:38:49.045 --> 00:38:53.555
with the actual decision makers when you are not,

827

00:38:54.135 --> 00:38:55.915
and you might think that you might be

828

00:38:56.795 --> 00:38:59.515
influencing the actual decision makers when you are not.

829

00:39:00.295 --> 00:39:02.275
So that's where it gets really fuzzy

830

00:39:02.335 --> 00:39:04.475
and real people oriented, and,

831

00:39:04.975 --> 00:39:06.995
and you really have to kind of take a step back

832

00:39:06.995 --> 00:39:09.115
and see how things are actually being done in the company

833

00:39:09.625 --> 00:39:12.475
because people tell themselves things

834

00:39:12.975 --> 00:39:14.675
and then they do something else, right?

835

00:39:14.675 --> 00:39:18.035
Right. And it's not, it's just inherently human.

836

00:39:18.625 --> 00:39:20.995
It's not like evil, per se.

837

00:39:21.335 --> 00:39:23.555

Um, but the closer, the official

838

00:39:23.555 --> 00:39:27.315

and the actual meat, you know, the, that's, for me, that's,

839

00:39:27.535 --> 00:39:29.755

that's one hallmark of a healthy culture.

840

00:39:30.975 --> 00:39:33.635

But regardless, uh, if you're trying to influence

841

00:39:34.815 --> 00:39:37.275

any organization, uh,

842

00:39:38.175 --> 00:39:41.155

you can't just take the org chart at face Value

843

00:39:42.855 --> 00:39:45.075

is one, one lesson that I've learned. Yeah,

844

00:39:45.075 --> 00:39:46.235

It's much more than an org chart.

845

00:39:46.615 --> 00:39:50.795

Uh, it is roles and responsibilities. And so, oh,

846

00:39:50.795 --> 00:39:51.795

Sorry. Those are also

847

00:39:51.795 --> 00:39:53.475

official roles and responsibilities. Yeah.

848

00:39:53.655 --> 00:39:55.395

And actual responsibilities. There you go.

849

00:39:56.735 --> 00:39:58.715

So, uh, I couldn't agree more.

850

00:39:58.715 --> 00:40:01.475

Yeah, it's, it's, it's, uh, you do need

851

00:40:01.475 --> 00:40:02.755
to sort of make those clear.

852

00:40:02.755 --> 00:40:06.755
Somehow, though, one of the things that, uh, probably

853

00:40:06.755 --> 00:40:09.115
with all, all three startups that I've worked with so far,

854

00:40:09.695 --> 00:40:11.235
uh, is developing.

855

00:40:11.535 --> 00:40:14.355
And initially we didn't have any SOPs at all. Right?

856

00:40:14.695 --> 00:40:16.995
So what do you do there? Uh, so you gotta,

857

00:40:17.175 --> 00:40:18.275
you create one, right?

858

00:40:18.335 --> 00:40:21.755
So they'll have lots of stuff on drive somewhere, you know,

859

00:40:21.755 --> 00:40:26.635
there'll be 50 different, uh, uh, documents, uh, on drive

860

00:40:26.715 --> 00:40:28.155
that try to describe what they do.

861

00:40:28.175 --> 00:40:30.395
But that's not consolidated. It's not clear.

862

00:40:30.395 --> 00:40:32.355
Many people don't even know about, uh, many

863

00:40:32.355 --> 00:40:34.355
of the documents in a, in a system like that.

864

00:40:34.895 --> 00:40:39.835

So the first thing I like to do is, uh, try to create a, uh,

865

00:40:40.785 --> 00:40:43.195

call the SOP Flat Ops manual call.

866

00:40:43.195 --> 00:40:44.955

Call it what you want. Um,

867

00:40:45.175 --> 00:40:49.395

and then the very front matter of that is

868

00:40:49.975 --> 00:40:53.155

the, the organization diagram of flight test

869

00:40:53.155 --> 00:40:55.195

and how you relate to the rest of the company.

870

00:40:55.775 --> 00:40:58.515

And then also, I list the roles

871

00:40:58.515 --> 00:41:00.915

and responsibilities by, you know, from the CEO

872

00:41:01.095 --> 00:41:02.915

and how it applies to flight test.

873

00:41:03.615 --> 00:41:08.155

So that is, uh, at least if you, if you try

874

00:41:08.155 --> 00:41:10.715

to get on the same page that way, that will help.

875

00:41:11.215 --> 00:41:13.075

Uh, it, I agree with you that there's,

876

00:41:13.075 --> 00:41:15.595

there's often decision makers that are not written down

877

00:41:15.595 --> 00:41:19.035

that just happen to be, uh, uh, maybe,

878

00:41:19.485 --> 00:41:22.515

maybe they're given the ability just, uh, by,

879

00:41:22.615 --> 00:41:24.515

by their experience and knowledge or something like that.

880

00:41:25.055 --> 00:41:28.875

Um, and, uh, so it's, it's important to recognize it though,

881

00:41:29.015 --> 00:41:31.115

you know, to, to recognize that, hey, there's,

882

00:41:31.115 --> 00:41:33.965

there's a decision making process that's occurring that

883

00:41:34.105 --> 00:41:35.485

that's not really documented.

884

00:41:35.485 --> 00:41:37.085

It's not what we say we're gonna do.

885

00:41:37.085 --> 00:41:38.965

It's not how we're gonna do it. So what do you do?

886

00:41:38.965 --> 00:41:40.045

You either change your document

887

00:41:40.045 --> 00:41:41.725

or you change your, uh, you know,

888

00:41:42.025 --> 00:41:44.605

change who's actually making the decisions. So,

889

00:41:45.355 --> 00:41:47.565

Pete Donut, Pete Dunne over here, uh,

890

00:41:47.595 --> 00:41:48.845

Looking, oh, over here.

891

00:41:48.895 --> 00:41:51.165

Sorry, Pete Dunne over here, uh, Rogan

892

00:41:51.165 --> 00:41:52.765
or Loper on vacation this week.

893

00:41:52.905 --> 00:41:55.765
So, um, getting back to your question about

894

00:41:55.825 --> 00:41:58.525
how do you help a startup, uh, you know, from being

895

00:41:58.825 --> 00:42:02.325
inside a big company, inside a small company, uh, regulator,

896

00:42:02.675 --> 00:42:04.605
sometimes what you need to do is you need to help

897

00:42:04.755 --> 00:42:07.405
that startup find what their blind spots are.

898

00:42:07.425 --> 00:42:09.005
And if you reveal those blind spots,

899

00:42:09.515 --> 00:42:13.405
then you can build some trust and get them to say, oh, okay.

900

00:42:13.465 --> 00:42:15.965
We need to really let down our guard

901

00:42:16.145 --> 00:42:19.445
and say, okay, help us know what we don't know, right?

902

00:42:19.625 --> 00:42:22.525
So, but the blind spots is, I think, the way

903

00:42:22.525 --> 00:42:27.405
to build the trust that gets a startup to, to,

904

00:42:27.625 --> 00:42:30.405
to suddenly realize we do need help.

905
00:42:33.925 --> 00:42:36.705
That's a great point. And then, uh, that just made me, uh,

906
00:42:36.705 --> 00:42:38.905
think about, uh, often what, uh,

907
00:42:39.005 --> 00:42:40.865
can occur is when you show up

908
00:42:40.925 --> 00:42:43.265
and what, here's the worst thing that you can do, is show up

909
00:42:43.265 --> 00:42:45.425
and say, Hey, I've got this SOP from Nav Air,

910
00:42:45.845 --> 00:42:46.905
and drop it on the desk

911
00:42:46.925 --> 00:42:48.345
and say, here's what we're doing now.

912
00:42:49.005 --> 00:42:50.905
Uh, it, they're, they're not ready for it.

913
00:42:51.205 --> 00:42:54.225
Uh, and, uh, it'll, it'll break the system.

914
00:42:54.765 --> 00:42:56.945
Uh, a lot of these startups are re again,

915
00:42:56.945 --> 00:42:59.025
they're resource constrained, and it's too much process,

916
00:42:59.285 --> 00:43:01.985
and there's all this red tape, it's super sticky, uh,

917
00:43:02.125 --> 00:43:03.225
and they, they can't breathe.

918
00:43:03.845 --> 00:43:06.865

Uh, so you have to, as a experience tester, you have to come

919

00:43:06.865 --> 00:43:08.425

to the table and go, okay, hey, what do we got?

920

00:43:09.245 --> 00:43:12.905

How can we work with where we're at and progress

921

00:43:12.925 --> 00:43:15.145

and grow in the right direction?

922

00:43:15.725 --> 00:43:19.465

Um, and, uh, so I see, uh, Rick's got his hand up.

923

00:43:25.035 --> 00:43:28.285

Here we go. Um, just to follow up with what Pete said, one

924

00:43:28.285 --> 00:43:29.965

of the things I observe with a lot

925

00:43:29.965 --> 00:43:31.725

of the startups is there are people

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00:43:31.725 --> 00:43:33.285

with tremendous experience,

927

00:43:34.025 --> 00:43:36.085

but, you know, there was, there may be five

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00:43:36.105 --> 00:43:37.365

or six different cultures

929

00:43:37.365 --> 00:43:39.085

because they came from different OEMs.

930

00:43:39.545 --> 00:43:42.285

And what, what some people miss is

931

00:43:42.285 --> 00:43:44.125

that they assume somebody's doing this

932

00:43:44.125 --> 00:43:46.165
because at the other company,

933

00:43:46.525 --> 00:43:47.885
somebody had responsibility for that.

934

00:43:48.505 --> 00:43:51.525
And that's where this, this SOP

935

00:43:51.665 --> 00:43:54.125
and responsibilities comes in very clear,

936

00:43:54.125 --> 00:43:58.325
because you've gotta now blend these, this, uh,

937

00:43:58.325 --> 00:44:00.125
culture from all these different OEMs

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00:44:00.125 --> 00:44:02.645
that did it differently, and now into one

939

00:44:03.245 --> 00:44:04.685
coherent, uh, team.

940

00:44:04.785 --> 00:44:06.445
And that's, that's a, that's a step

941

00:44:06.445 --> 00:44:10.085
that you gotta first identify what, what the assumptions are

942

00:44:10.225 --> 00:44:11.805
by each of the individuals in the team.

943

00:44:23.455 --> 00:44:25.555
So I'll talk a little bit more about this in mind

944

00:44:25.995 --> 00:44:28.035
tomorrow, but in doing the research for

945

00:44:28.185 --> 00:44:31.525

what I'm gonna present tomorrow, it was amazing to me

946

00:44:32.145 --> 00:44:36.565

how many incidents, accidents, disasters trace

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00:44:37.315 --> 00:44:39.805

back to a culture thing, right?

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00:44:41.035 --> 00:44:43.005

Sharing experience is easy.

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00:44:43.225 --> 00:44:45.165

And when you go as a, you know,

950

00:44:45.325 --> 00:44:47.485

a gray beard into somebody's organization

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00:44:47.745 --> 00:44:49.965

and you share your experience, that's very easy.

952

00:44:50.645 --> 00:44:53.445

Transferring experience is hard, right?

953

00:44:53.945 --> 00:44:58.205

Um, changing culture is damn near impossible.

954

00:44:59.545 --> 00:45:01.445

The, the opportunity you have

955

00:45:01.445 --> 00:45:05.925

with a startup is the culture may not be quite solidified

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00:45:06.025 --> 00:45:08.285

yet, it may be still processing.

957

00:45:08.545 --> 00:45:10.765

So you have an opportunity to

958

00:45:11.735 --> 00:45:15.965

maybe affect the culture with an existing organization

959

00:45:15.965 --> 00:45:17.045
that's been around a long time.

960

00:45:17.205 --> 00:45:19.165
I mean, NASA's the prime example.

961

00:45:19.395 --> 00:45:23.165
Look at challenger traces back to cultural issues.

962

00:45:23.825 --> 00:45:25.605
And then not too far down the road,

963

00:45:25.875 --> 00:45:29.205
they've drifted right back to the same thing with Columbia.

964

00:45:29.985 --> 00:45:31.485
Um, how does that happen?

965

00:45:31.625 --> 00:45:34.485
We came in, we had an incident, we had a, you know,

966

00:45:34.585 --> 00:45:37.845
an earth shattering experience for the organization

967

00:45:38.555 --> 00:45:39.925
that changed the culture,

968

00:45:40.145 --> 00:45:43.005
but eventually it drifted right back to what it was.

969

00:45:43.805 --> 00:45:47.965
'cause I don't know yet if we understand how to put

970

00:45:48.695 --> 00:45:51.765
guardrails up so that the culture doesn't drift back

971

00:45:52.025 --> 00:45:55.205
to its comfort zone or what it's known or what it's done.

972

00:45:55.545 --> 00:45:57.325

And I think to your point, what you,

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00:45:57.755 --> 00:45:59.165

what you have the opportunity to do

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00:45:59.165 --> 00:46:02.965

with a startup is maybe influence that culture in such a way

975

00:46:03.275 --> 00:46:05.925

that you can establish it not only in a good direction,

976

00:46:06.145 --> 00:46:08.165

but with guardrails to keep it going that way.

977

00:46:09.705 --> 00:46:11.085

That's a great point. Turbo. Hold on.

978

00:46:11.305 --> 00:46:15.885

Um, it's a lot of fun to come into an organization

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00:46:15.885 --> 00:46:19.205

that's just forming and, and you get to influence it.

980

00:46:19.205 --> 00:46:22.405

There, you, you can shape it. Uh, that's, that's tremendous.

981

00:46:22.665 --> 00:46:24.325

You know, it, it's an opportunity

982

00:46:24.325 --> 00:46:26.205

that you just don't get all the time.

983

00:46:26.785 --> 00:46:31.485

Uh, so, uh, I'm, I'm not, uh, it's not lost on me that, uh,

984

00:46:31.745 --> 00:46:35.205

as I, as I show up, especially at Pivotal now, uh,

985

00:46:35.505 --> 00:46:37.885

I'm influencing and forming the culture, uh,

986

00:46:37.885 --> 00:46:40.525

helping the culture form in the right ways.

987

00:46:40.865 --> 00:46:43.405

And, and it's gonna live long after I'm gone.

988

00:46:43.825 --> 00:46:47.805

Uh, because like Turbo said, it's, it's nearly impossible

989

00:46:47.805 --> 00:46:50.285

to change a company's culture once it gets established.

990

00:46:51.555 --> 00:46:54.785

So, any other questions

991

00:46:54.885 --> 00:46:59.425

or comments, any heuristics that you want to share?

992

00:47:01.115 --> 00:47:05.525

Okay. And if not, I am gonna give you nine minutes back, uh,

993

00:47:05.785 --> 00:47:07.805

and then we'll transition to Marty's brief.

994

00:47:08.305 --> 00:47:09.305

So cheers.

995

00:47:21.235 --> 00:47:21.725

Alright.

996

00:47:31.195 --> 00:47:31.615

I'm gonna take.