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00:00:01,506 --> 00:00:06,386

>> We have an opportunity here in the Mission Control Center to be joined

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00:00:06,386 --> 00:00:12,406

by the Commercial Crew Program Manager Ed Mango. Ed, we really appreciate you stopping by.

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00:00:12,406 --> 00:00:17,156

I know you, you flew into Houston I guess yesterday and, and so we grabbed you

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00:00:17,156 --> 00:00:22,776

for a few minutes to come by and I know Mission Control's not unfamiliar to you in your,

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00:00:22,956 --> 00:00:27,406

in your past life, supporting space shuttle program here.

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00:00:27,636 --> 00:00:28,596

So, welcome.

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00:00:28,596 --> 00:00:30,246

Thanks for stopping by for a few minutes.

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00:00:30,426 --> 00:00:31,406

>> It's very good to be here.

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00:00:32,146 --> 00:00:35,296

>> Well, you know, I usually, when I talk to folks I usually start

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00:00:35,296 --> 00:00:41,826

out to let the audience know a little bit about them, your whole history about getting to NASA,

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00:00:41,826 --> 00:00:46,896

give us a little bit biographical info on

how you ended up in the space business,

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00:00:46,896 --> 00:00:48,836  
where you went to school, those types of things.

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00:00:49,176 --> 00:00:56,716  
>> Let's see, I, I grew up in South Florida and I got to see Apollo 17 launch from my backyard

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00:00:56,986 --> 00:00:59,706  
down in South Florida, 'cause it was a night launch.

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00:01:00,146 --> 00:01:03,706  
And that turned me onto this space stuff is pretty cool.

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00:01:03,846 --> 00:01:09,166  
Ended up going to school up in Saint Louis, Saint Louis University, Parks College and,

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00:01:09,166 --> 00:01:13,006  
and then I spent a couple years in the Air Force, about five years in the Air Force,

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00:01:13,006 --> 00:01:16,766  
working the shuttle at Vandenberg, when we were going to do a Vandenberg program.

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00:01:17,236 --> 00:01:22,956  
Once that was decided not to go there, some NASA folks at Kennedy asked me to come work

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00:01:23,206 --> 00:01:25,746  
at Kennedy, so I jumped that in a heartbeat.

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00:01:25,996 --> 00:01:30,896  
And I've been at Kennedy for most of my career since then, except during our return to flight

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00:01:30,896 --> 00:01:37,086

for post Columbia, I came over here to JSC, great place to work and was Deputy

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00:01:37,086 --> 00:01:42,026

of the Orbiter Project Office during return of flight phase since I've been back at Kennedy.

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00:01:42,026 --> 00:01:46,416

And, and about a couple of years ago, I was asked to lead the Commercial Crew Program,

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00:01:46,896 --> 00:01:48,456

and at that point, it was a planning office,

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00:01:48,456 --> 00:01:51,216

trying to figure out if we can do a commercial crew endeavor

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00:01:51,746 --> 00:01:54,536

and now it's a full program and we're trying to execute.

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00:01:54,826 --> 00:01:56,416

>> Well, here we go.

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00:01:56,416 --> 00:02:02,096

You know, you, you kind of talked about how you segued into that role but, you know,

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00:02:02,096 --> 00:02:06,436

the government, the way we've done business in the past, it's a little bit different with,

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00:02:06,546 --> 00:02:10,056

with your program, moving into a commercial crew endeavor.

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00:02:10,416 --> 00:02:16,626

But give us a kind of a flavor for how your organization is set up and, you know,

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00:02:16,766 --> 00:02:20,116

because you've got folks working with the Program Office in Florida,

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00:02:20,116 --> 00:02:27,096

the Deputy Program obviously based here, so there's a lot of interaction between your team,

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00:02:27,096 --> 00:02:29,496

but how, how did you organize all that?

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00:02:29,686 --> 00:02:35,966

>> And see when we started the program, or the Planning Office for the program, Brent Jett,

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00:02:36,006 --> 00:02:38,426

[assumed spelling] who's my Deputy here in Houston, got together --

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00:02:38,426 --> 00:02:40,656

him and I got together and said, how do we want to organize.

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00:02:41,256 --> 00:02:44,766

And, unlike the Shuttle Program that had different projects at different centers,

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00:02:45,306 --> 00:02:51,016

we wanted to be as centerless as possible and get the right talent in the program.

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00:02:51,016 --> 00:02:56,946

So we created organizations within the program that are -- have people here in Johnson,

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00:02:56,946 --> 00:02:59,046

as well as people at Kennedy,

as well as people at Marshall,

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00:02:59,376 --> 00:03:03,486

and they work in the same specific areas, like launch vehicle,

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00:03:03,826 --> 00:03:07,796

like in our partner integration teams and that kind of thing.

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00:03:07,796 --> 00:03:09,746

And we looked for the best people to go do those,

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00:03:09,746 --> 00:03:13,126

it didn't matter what zip code they lived in, to create the program office.

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00:03:13,126 --> 00:03:15,866

So it's a little different than what the shuttle program did.

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00:03:15,866 --> 00:03:22,436

At the same point, you know, in our, in 2012, I think the borders of zip codes

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00:03:22,436 --> 00:03:24,856

and things are much easier to get around because

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00:03:24,856 --> 00:03:29,066

of all the media ability to communicate back and forth.

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00:03:29,196 --> 00:03:29,856

>> Right. Right.

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00:03:30,356 --> 00:03:36,796

The other aspect of commercial crew is if you're operating under Space Act Agreements,

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00:03:36,796 --> 00:03:38,936

which we're all familiar with  
that obviously in business,

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00:03:38,986 --> 00:03:44,326

but it's not a true contract type  
scenario and try and lay out for us the,

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00:03:44,566 --> 00:03:49,896

the Space Act Agreement, part of the  
program, how that works and, and what your,

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00:03:49,896 --> 00:03:53,726

some of your milestones have  
been and, and are, are coming up.

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00:03:54,706 --> 00:04:00,396

>> Yeah, Space Act Agreements are -- as a  
different set of words when I first started,

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00:04:00,536 --> 00:04:06,286

again, I was used to contract mechanisms  
and, and, and general terms of contract is,

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00:04:06,286 --> 00:04:10,926

is there's a, there's a customer  
and, and a client.

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00:04:11,096 --> 00:04:13,466

And then there's someone  
who's producing the activity

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00:04:13,806 --> 00:04:15,576

and that's a standard contract approach.

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00:04:15,756 --> 00:04:18,696

And in SAA, the biggest different  
is it's a partnership

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00:04:18,696 --> 00:04:21,576

and we both are bringing  
capability to the partnership.

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00:04:22,666 --> 00:04:27,816

In this case, for commercial crew, we are  
bringing funding, a pretty big part of funding

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00:04:28,296 --> 00:04:30,686

and -- but we're also bringing  
our 50 years of experience.

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00:04:30,686 --> 00:04:35,526

Our engineers are safety professionals,  
our program management folks

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00:04:35,526 --> 00:04:38,116

to go help the individual partners move forward.

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00:04:38,116 --> 00:04:43,056

And our partners are our companies, so we don't  
call them contractors, we call them partners.

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00:04:43,106 --> 00:04:48,036

The big thing, big difference is is  
in a contract you can direct the,

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00:04:48,266 --> 00:04:51,336

the contractor to do work,  
sometimes it comes at a cost.

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00:04:51,826 --> 00:04:58,096

And a partnership, it's really a, it's  
a discussion between the two partners

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00:04:58,096 --> 00:05:02,806

of what is the right thing to go do and so the  
government can't force a partner to go do A,

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00:05:02,806 --> 00:05:06,556

B or C, but it's through our  
influence and through our experience

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00:05:06,556 --> 00:05:09,056

that we can help the partners  
move forward with their designs.

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00:05:09,266 --> 00:05:09,506

>> All right.

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00:05:09,506 --> 00:05:14,586

That's, that's really -- it's an interesting,  
it's an interesting approach and you,

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00:05:14,636 --> 00:05:18,646

I think you -- I don't know if this is the  
right time for you, but you had a short video

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00:05:18,646 --> 00:05:22,226

that you asked us to prepare for  
you, is this a good time for that?

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00:05:22,226 --> 00:05:24,536

>> Yeah. I think it's a, a real  
good time because it's going

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00:05:24,536 --> 00:05:30,306

to explain briefly how what we're trying  
to get done in a, in a very positive sense.

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00:05:30,566 --> 00:05:31,526

>> 'Kay. Let's run that.

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00:05:32,516 --> 00:06:38,516

[ Music ]

83

00:06:39,016 --> 00:06:44,000

[ Silence ]

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00:06:45,286 --> 00:06:50,266

>> Oh, that's pretty fast paced  
and probably representative of the,

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00:06:50,536 --> 00:06:54,326

the Commercial Crew Program right  
now as being pretty fast paced.

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00:06:56,296 --> 00:07:00,976

You've obviously, you know, we  
just got where we're operating

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00:07:00,976 --> 00:07:05,276

under the fiscal '12 budget right now and  
you, you, you've got probably about half

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00:07:05,276 --> 00:07:10,926

of what the original request was and that, that  
-- you had to do a little bit of restructuring

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00:07:10,926 --> 00:07:16,256

and how you, your philosophy on going forward  
and can you talk a little bit about that and,

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00:07:16,256 --> 00:07:21,576

and maybe about your '13 request that obviously  
is just getting started for the program.

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00:07:21,706 --> 00:07:27,776

>> Sure. You know, we -- the President  
asked for 850 last year and the in the end,

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00:07:27,806 --> 00:07:33,486

through all the negotiating, we end up getting  
406, so it's a lot less than we had anticipated.

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00:07:34,046 --> 00:07:37,586

And so one of the first things we did is we saw

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00:07:37,586 --> 00:07:40,846

that there's some uncertainty  
in the budget numbers.

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00:07:40,846 --> 00:07:44,246

We're going to have, not only for this, a  
406, but also for the next couple years.

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00:07:44,316 --> 00:07:52,296

So we decided to back off from a, a fixed price  
contract and move into a, back into an SAA.

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00:07:52,296 --> 00:07:57,406

and I talked earlier about what SAAs  
were with partners and on our contract,

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00:07:57,406 --> 00:08:02,396

we can drive them that the, the issue was  
on the fixed price, the government now is --

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00:08:02,396 --> 00:08:07,286

on that fixed price is guaranteed to  
have to pay so much for so much effort.

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00:08:07,466 --> 00:08:10,606

And if we didn't have that kind of  
money, then, then the government side

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00:08:10,606 --> 00:08:12,666

of that contract would, would be in trouble.

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00:08:12,666 --> 00:08:16,116

So, that we -- for flexibility  
went back to an SAA.

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00:08:16,316 --> 00:08:20,666

This year, we're, you know, the  
President's budget asked for 830,

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00:08:20,666 --> 00:08:23,936

and the reason for that is,

is you know, the, the --

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00:08:24,216 --> 00:08:28,626  
we need enough money to get  
into serious design work,

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00:08:28,936 --> 00:08:31,546  
serious development work and  
then in the certification.

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00:08:31,626 --> 00:08:34,796  
So if we're 830 per year for  
the next four or five years,

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00:08:35,246 --> 00:08:38,596  
that's how much money we think  
we need in order to get at least

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00:08:38,646 --> 00:08:43,096  
to multiple systems through  
certification basically.

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00:08:43,656 --> 00:08:49,686  
The reason, you know, a lot of talk about  
competition and I just, I would say that,

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00:08:50,266 --> 00:08:56,266  
you know, for all of us, the competition is, is  
key to how we do our whole acquisition approach

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00:08:56,726 --> 00:09:01,346  
because as you have competition, then  
individual companies are going to see

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00:09:01,346 --> 00:09:06,636  
that they have a competitor on their side,  
and therefore they have to do things in order

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00:09:06,636 --> 00:09:08,306  
to make their system better, in order

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00:09:08,306 --> 00:09:12,196

to make their system either more cost effective or have more performance.

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00:09:12,236 --> 00:09:12,996

>> Right. Right.

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00:09:13,236 --> 00:09:17,556

Well, you know, part of that is, you know, what you're talking about,

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00:09:17,556 --> 00:09:23,966

narrowing it down to a couple of companies, obviously I believe you got seven now that are,

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00:09:24,096 --> 00:09:31,806

that are operating under funded and unfunded Space Act Agreements and lay out how that,

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00:09:31,976 --> 00:09:38,266

how that is all structured right now, and, and what some milestones are leading

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00:09:38,266 --> 00:09:42,576

up to selecting the finalist, if you will.

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00:09:43,346 --> 00:09:50,106

>> Okay. I think we even have a chart that kind of highlights all seven of our current partners

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00:09:50,136 --> 00:09:52,436

of which, we can show that, that would be good.

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00:09:53,416 --> 00:09:58,206

Let's see, we have four partners that are funded and three that are unfunded and we did

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00:09:58,206 --> 00:10:00,776

that as we entered in the [inaudible].

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00:10:00,776 --> 00:10:06,886

The agency and, and the organization, the program looked at the entrance of [inaudible]

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00:10:06,886 --> 00:10:11,956

and said, our biggest technology risks, or our biggest risk towards development are really

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00:10:11,956 --> 00:10:14,876

in spacecraft at this particular point.

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00:10:14,956 --> 00:10:19,446

And so we really wanted to fund those spacecraft entities, and that's what we did for [inaudible]

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00:10:19,516 --> 00:10:21,506

and that's why those are funded ones.

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00:10:22,076 --> 00:10:27,566

Alongside of that, there are some unfunded ones that wanted to have us continue to work

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00:10:27,606 --> 00:10:31,866

with them on their launch vehicles and how they might design their launch vehicles

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00:10:31,866 --> 00:10:33,336

and or certify the launch vehicles.

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00:10:33,336 --> 00:10:37,906

And so we entered into a couple more unfunded with some launch vehicle folks.

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00:10:37,946 --> 00:10:40,966

And there is another spacecraft that wanted also to have it unfunded.

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00:10:40,966 --> 00:10:43,336

So, we, we worked with all seven of those.

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00:10:43,336 --> 00:10:49,946

The unfunded ones don't cost the taxpayer any dollars, except in, really in NASA support

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00:10:50,286 --> 00:10:52,266

to go support those particular entities,

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00:10:52,266 --> 00:10:56,456

but there's no funding exchange going on between us and the partner.

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00:10:56,876 --> 00:11:01,136

The funded ones are, are really the ones that are trying to move us forward

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00:11:01,136 --> 00:11:03,716

on overall development and there are four of those.

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00:11:04,116 --> 00:11:06,916

The first is really Blue Origin.

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00:11:06,916 --> 00:11:11,736

Blue Origin is out of Seattle, and they are working towards some very good effort

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00:11:11,736 --> 00:11:19,456

on their abort system, as well as a potential launch system for their, for their design.

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00:11:19,786 --> 00:11:24,626

Boeing is the next one and Boeing is really working hard, a little more conditional

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00:11:24,626 --> 00:11:29,506

in how they do business and they're working towards a preliminary design review

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00:11:29,506 --> 00:11:34,046

of which we just finished their hardware one a couple of weeks ago, and in fact that's why I'm

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00:11:34,046 --> 00:11:36,096

in Houston is to close out their PDR.

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00:11:36,286 --> 00:11:41,246

We call it preliminary design review and, and that was really a joint partnership

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00:11:41,246 --> 00:11:46,916

between us and, and, and Boeing to where a lot of the findings and a lot of the issues

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00:11:46,916 --> 00:11:50,786

that came out of that PDR were found through a joint team between us

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00:11:50,786 --> 00:11:52,456

and Boeing, very, very good effort.

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00:11:53,066 --> 00:11:58,266

Let's see, Sierra Nevada is our next, another company, they're out of Colorado

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00:11:58,266 --> 00:12:02,186

and they have a winged vehicle that they are developing and the biggest part

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00:12:02,186 --> 00:12:08,016

about a wing vehicle is how, how are you going to integrate the G&C, or the guidance

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00:12:08,016 --> 00:12:11,566

and control systems of a wing vehicle, so they're focused on that.

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00:12:11,696 --> 00:12:16,496

And plus, also working towards a PDR kind of effort that they'll do later here this spring.

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00:12:16,636 --> 00:12:22,516

And the last is Space X and Space X is really taking their cargo system and trying

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00:12:22,516 --> 00:12:26,676

to convert it to a, a human capable system to carry crew

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00:12:26,676 --> 00:12:30,506

and their biggest effort during [inaudible] is really about aborts

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00:12:30,506 --> 00:12:32,196

and their abort motors and abort system.

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00:12:32,506 --> 00:12:36,876

>> Right. Well, it's a, it's a, it's a great opportunity obviously for all

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00:12:36,876 --> 00:12:41,176

of these companies to, to get involved, a perfect opportunity to --

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00:12:41,416 --> 00:12:46,806

for you to be here because obviously the, one of the goals is to transport crew back and forth

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00:12:46,806 --> 00:12:50,386

to the space station and of course this is the Station Flight Control,

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00:12:50,386 --> 00:12:56,586

in fact just a little while ago, Dan Burbank had an opportunity to do a, an interview

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00:12:56,586 --> 00:13:02,806

and he was asked about that and he, he mentioned that the time is right and, and, you know,

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00:13:02,806 --> 00:13:08,346

that some of the systems are well enough understood to, to get to that point

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00:13:08,346 --> 00:13:11,766

where we can actually have a U.S. spacecraft.

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00:13:12,026 --> 00:13:16,716

And one of the last questions I wanted to ask you while you had time was, you know, I,

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00:13:17,016 --> 00:13:21,516

I kind of sense it working supporting the commercial crew a little bit,

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00:13:22,136 --> 00:13:27,446

but it seems to me there's a lot of excitement, not only on, on the NASA side, but on --

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00:13:27,446 --> 00:13:32,296

with all of these companies as they, you know, as kind of an integrated approach

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00:13:32,296 --> 00:13:35,946

and you've got folks that are supporting each one of those, but I mean, do you,

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00:13:36,056 --> 00:13:39,306

do you sense that when you travel a lot and talk to those people?

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00:13:39,536 --> 00:13:46,126

>> Yeah. Let's see, our, our -- what we call them, PIT teams, our partner integration teams,

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00:13:46,126 --> 00:13:48,896

and I call them PIT crews for short

and I think you'll be talking to some

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00:13:48,896 --> 00:13:50,776

of them over the next week or so.

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00:13:50,776 --> 00:13:57,206

Our PIT crews are extremely excited about what's going on with each of their partners and,

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00:13:57,206 --> 00:14:00,196

and in the program, we're really excited

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00:14:00,196 --> 00:14:03,826

about how we are developing the system very nontraditional.

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00:14:04,446 --> 00:14:08,636

Overall, it's a nontraditional approach, but we are, we have the confidence

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00:14:08,636 --> 00:14:10,766

that says that we are going to get there.

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00:14:10,766 --> 00:14:15,246

And given enough funding, we can get there by the middle of the decade and I think Dan and,

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00:14:15,246 --> 00:14:20,946

and the crew on station would like us very much to have a capability that has a U.S. flag flying

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00:14:20,946 --> 00:14:26,376

on it, in order to get, not just our crew, but the crew from across the planet to the ISS

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00:14:26,376 --> 00:14:30,796

and to that great laboratory that we have on -- in space and so the timing is right.

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00:14:31,276 --> 00:14:37,296

Shuttle was a fantastic capability, it, it ended last year and now it's time to move forward

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00:14:37,296 --> 00:14:39,236

with the next capability to get to low Earth orbit

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00:14:39,716 --> 00:14:41,606

and that's what we're, that's what we're all doing.

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00:14:41,606 --> 00:14:45,936

The companies are really over the top on, on excited, you know?

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00:14:45,936 --> 00:14:51,676

They -- and because of the competition, you can see it's like, it's like different teams trying

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00:14:51,676 --> 00:14:56,316

to compete against each other and really against themselves to perform so,

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00:14:56,376 --> 00:14:58,696

so well and get designs that can work.

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00:14:59,006 --> 00:15:02,756

>> Yeah. Well, look, Ed, we really appreciate you taking time out.

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00:15:02,756 --> 00:15:07,556

I know you're busy and with all the work that you came to Houston for, but it's really great

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00:15:07,556 --> 00:15:12,086

for you to come by here and visit Mission Control and, and kind of update us

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00:15:12,086 --> 00:15:15,086

on everything that's going on with  
commercial crew, so we appreciate it.

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00:15:15,086 --> 00:15:20,196

Ed Mango, the Manager of the Commercial Crew  
Program stopping by here in Mission Control

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00:15:20,196 --> 00:15:24,416

for a, a talk about his program  
and what's been going on there.

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00:15:25,086 --> 00:15:25,666

Thanks, Ed.