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00:00:01,276 --> 00:00:04,556

[Brandi Dean] We're back in Building 7 again in the spacesuit lab with Marc Ciupitu again.

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00:00:04,816 --> 00:00:08,376

And he's going to tell us...we talked a little bit last time about the Orlan suit.

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00:00:08,376 --> 00:00:11,126

He's going to tell us a little bit now about how it differs from the EMU,

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00:00:11,436 --> 00:00:15,726

the Extravehicular Mobility Unit, that we use on U.S. spacewalks.

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00:00:15,886 --> 00:00:18,866

So we've got the EMU here next to us.

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00:00:18,866 --> 00:00:20,266

Maybe you can point out a few of the features.

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00:00:20,466 --> 00:00:20,866

[Marc Ciupitu] Sure.

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00:00:21,226 --> 00:00:26,326

I mentioned that on the Orlan how you ingress through a door on the back of the suit.

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00:00:26,326 --> 00:00:27,966

So that's one of the main differences

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00:00:28,026 --> 00:00:31,356

between the two suits...how you put the suit on, how you don it.

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00:00:31,726 --> 00:00:34,986

The EMU is made more like clothing basically.

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00:00:34,986 --> 00:00:37,466

You have all these components
that you have to put on.

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00:00:37,886 --> 00:00:43,966

The heart of the torso is attached in
the station so the crew can ingress it.

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00:00:43,966 --> 00:00:47,856

But for each crew member you
have to add your own arms.

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00:00:48,456 --> 00:00:49,896

They're on lower torso.

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00:00:50,416 --> 00:00:56,096

So the crew ingresses through the heart of the
torso and then they have to pull the pants,

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00:00:56,096 --> 00:00:59,116

if you will, the lower torso assembly
on and they lock that into place.

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00:00:59,656 --> 00:01:01,016

They have to put the helmet on as well.

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00:01:01,056 --> 00:01:02,946

Cause that's not attached like on the Orlan.

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00:01:03,716 --> 00:01:05,126

And then lastly they put on the gloves.

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00:01:05,496 --> 00:01:05,716

[Brandi] Okay.

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00:01:05,906 --> 00:01:08,856

So you were showing us on the
Orlan suit how they have to,

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00:01:08,856 --> 00:01:10,876

kind of cinch to the different sizes.

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00:01:10,876 --> 00:01:15,586

We have different size arms and legs and
hard upper body torso and things like that.

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00:01:15,586 --> 00:01:15,936

[Marc] Correct.

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00:01:16,256 --> 00:01:16,666

[Brandi] Right?

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00:01:16,666 --> 00:01:20,786

[Marc] Each crew member, the EMU
is tailored to them specifically.

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00:01:20,856 --> 00:01:25,386

So we launch specific components
for them to match their sizing.

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00:01:25,586 --> 00:01:27,866

[Brandi] You can have really long arms
but really short legs if you want.

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00:01:28,066 --> 00:01:28,466

[Marc] That's right.

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00:01:28,756 --> 00:01:28,916

[Brandi] Okay.

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00:01:29,456 --> 00:01:34,726

And then we've seen people get into the
suits on the station in microgravity.

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00:01:34,726 --> 00:01:36,816

I'm sure it's probably even a
little easier than it is here.

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00:01:36,876 --> 00:01:38,926

You have to kind of crawl up into it.

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00:01:39,646 --> 00:01:40,096

[Marc] Correct.

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00:01:40,536 --> 00:01:45,996

The back...the backpack is
locked in place in the station.

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00:01:45,996 --> 00:01:49,476

The crew will already have
donned the lower torso.

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00:01:49,616 --> 00:01:54,136

And they sort of have to wiggle their way
inside the heart of the torso to the arms.

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00:01:54,586 --> 00:01:56,076

It's not an easy procedure and once they're

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00:01:56,076 --> 00:01:59,856

in there they lock the lower torso
in place and then the helmet.

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00:02:00,276 --> 00:02:00,566

[Brandi] Okay.

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00:02:00,906 --> 00:02:04,026

And how long does it take us
to get ready for a spacewalk?

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00:02:04,206 --> 00:02:05,666

[Marc] We're around four hours.

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00:02:05,726 --> 00:02:07,036

Around the same time.

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00:02:08,056 --> 00:02:08,186

[Brandi] Okay.

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00:02:08,816 --> 00:02:10,416

[Marc] The other difference to point

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00:02:10,416 --> 00:02:12,716

out is...you see the display
and control module here.

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00:02:13,076 --> 00:02:16,806

Basically, it has all the
components put together that you see

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00:02:16,806 --> 00:02:19,056

on the Orlan is split up in four.

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00:02:19,056 --> 00:02:24,176

You have this electrical control
panel, the gauge, the pneumo-hydraulic

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00:02:24,466 --> 00:02:26,886

and THE interface for the umbilical.

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00:02:27,216 --> 00:02:28,346

It's four separate areas.

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00:02:28,606 --> 00:02:31,816

Whereas on the EMU it is all together
on the display and control module.

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00:02:32,096 --> 00:02:34,646

[Brandi] And I always think
it's interesting how the letters

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00:02:34,646 --> 00:02:36,306

and numbers are backwards on the suit.

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00:02:36,466 --> 00:02:36,946

[Marc] Correct.

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00:02:37,046 --> 00:02:40,756

the crew member can only see using wrist mirrors that they put on the gloves.

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00:02:40,906 --> 00:02:43,036

So they have to put everything [unintelligible].

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00:02:43,036 --> 00:02:45,506

Right they are installed on the gloves.

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00:02:45,506 --> 00:02:48,476

[Brandi] And then they can hold it front of their chest to see.

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00:02:48,646 --> 00:02:51,926

[Marc] That's the only way they can see basically on the chest.

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00:02:51,926 --> 00:02:52,016

[Brandi] Okay.

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00:02:52,016 --> 00:02:56,236

[Marc] Another main difference to point out is the pressure inside each suit.

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00:02:56,776 --> 00:02:59,026

The EMU operates at 4.3 PSI.

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00:02:59,126 --> 00:03:01,966

The Orlan operates a little bit higher at 5.8 PSI.

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00:03:02,646 --> 00:03:07,066

So the EMU is a little less strenuous for the crew member's to work in.

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00:03:07,316 --> 00:03:07,936

More flexible.

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00:03:08,526 --> 00:03:08,836

[Brandi] Alright.

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00:03:08,836 --> 00:03:12,846

And I know...I mean...our suit was designed

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00:03:13,046 --> 00:03:15,596

when we were starting the shuttle
program right...and I'm sure.

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00:03:15,596 --> 00:03:16,836

I don't know how...how old is the Orlan?

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00:03:16,836 --> 00:03:23,456

[Marc] The Orlan has the first
version back in the Voskhod,

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00:03:23,926 --> 00:03:26,966

when they had the Salyut, their space station.

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00:03:27,046 --> 00:03:29,596

So it's been from the late 60's.

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00:03:30,066 --> 00:03:30,506

[Brandi] So, yeah.

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00:03:31,366 --> 00:03:34,006

We're doing really pretty amazing
things with some old technology.

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00:03:34,176 --> 00:03:35,046

[Marc] That's correct.

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00:03:35,046 --> 00:03:40,836

We work on trying to achieve the same
goal, independently, continents apart.

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00:03:41,056 --> 00:03:44,086

But we came to the same goal,
just different avenues.

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00:03:44,146 --> 00:03:46,836

In the end they are all doing the same thing.

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00:03:47,156 --> 00:03:51,246

[Brandi] And I know here at NASA we're working
on building some new designs for spacesuits.

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00:03:51,326 --> 00:03:54,446

We should get some cool stuff
to see pretty soon.

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00:03:54,586 --> 00:03:57,756

[Marc] And hopefully we can collaborate
with our international partners

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00:03:57,866 --> 00:03:59,866

and we'll come out with a good final product.

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00:04:01,066 --> 00:04:02,016

[Brandi] Well thank you again Marc.