
SPACE LAUNCH SYSTEM
ORION MULTI PURPOSE CREW VEH

1
00:00:00,960 --> 00:00:02,600
>> Dan Huot: Everybody,
Dan Huot here.

2
00:00:02,600 --> 00:00:04,710
Still in the Space
Vehicle Mock Up Facility.

3
00:00:04,710 --> 00:00:06,760
I'm back at the Orion capsules.

4
00:00:06,760 --> 00:00:09,840
So continuing their crew
egress fully suited runs.

5
00:00:09,840 --> 00:00:12,930
Doing some tests on a lot
of the systems inside.

6
00:00:12,930 --> 00:00:14,930
Joining me now is
Dustin Gohemert.

7
00:00:14,930 --> 00:00:17,960
He's the crew survival
system's manager here overseeing

8
00:00:17,960 --> 00:00:18,730
the tests.

9
00:00:18,730 --> 00:00:20,930
First off, thanks for
breaking away for a few minutes

10
00:00:20,930 --> 00:00:23,250
from the test and coming
over the talk to me.

11
00:00:23,250 --> 00:00:26,710

Now, Crew Survival Systems
Manager, you're looking

12
00:00:26,710 --> 00:00:28,930
over everything that's
keeping the crew alive inside

13
00:00:28,930 --> 00:00:29,830
this thing.

14
00:00:29,830 --> 00:00:30,830
>> Dustin Gohemert:
That's pretty much correct.

15
00:00:30,830 --> 00:00:34,040
So everything that the crew
touches, wears, does, sits on,

16
00:00:34,040 --> 00:00:36,930
interacts with that keeps them
alive in normal situations

17
00:00:36,930 --> 00:00:38,460
and emergencies we work on.

18
00:00:38,460 --> 00:00:42,320
So, our main hardware that's
easy to speak of is the seats.

19
00:00:42,320 --> 00:00:44,220
The crew survival equipment
that they would use.

20
00:00:44,220 --> 00:00:45,950
So this includes things
like the life rafts

21
00:00:45,950 --> 00:00:48,460
or their life preserver
units or even things

22
00:00:48,460 --> 00:00:51,520
like signal flares they would
carry with them post egress.

23
00:00:51,520 --> 00:00:53,430
And then also the space
suits which would be used

24
00:00:53,430 --> 00:00:55,580
in particular contingencies

25
00:00:55,580 --> 00:00:59,050
for cabin emergencies
and space vacuum.

26
00:00:59,050 --> 00:00:59,400
>> Dan Huot: Okay.

27
00:00:59,400 --> 00:01:02,890
So, we had talked to Jeff
Fox a little bit earlier

28
00:01:02,890 --> 00:01:03,620
about the seats.

29
00:01:03,620 --> 00:01:05,340
They're changing the
seating arrangement up

30
00:01:05,340 --> 00:01:06,880
and a lot of things like that.

31
00:01:06,880 --> 00:01:10,060
Now, as Crew Safety, what's
your involvement with the seats?

32
00:01:10,060 --> 00:01:12,970
What are you guys looking at

what are you concerned about?

33
00:01:12,970 --> 00:01:13,920
>> Dustin Gohemert:
So, specifically,

34
00:01:13,920 --> 00:01:17,170
our group is involved in the
design of the seat itself.

35
00:01:17,170 --> 00:01:20,180
Which you can't design the seat
without having some knowledge

36
00:01:20,180 --> 00:01:22,290
of it's interaction
with the vehicle.

37
00:01:22,290 --> 00:01:23,570
And so we're here today looking

38
00:01:23,570 --> 00:01:26,930
at how the vehicle is placing
the seats within itself

39
00:01:26,930 --> 00:01:29,410
or how we're placing the seats
within the vehicle spacing

40
00:01:29,410 --> 00:01:31,870
to understand what design
tweaks we need to make

41
00:01:31,870 --> 00:01:33,180
to keep the crew safe.

42
00:01:33,180 --> 00:01:35,880
How the acceleration
loads that are imparted

43
00:01:35,880 --> 00:01:38,450
on the vehicle will be
transferred to the crew

44
00:01:38,450 --> 00:01:41,550
so we can properly design
it for their safety.

45
00:01:41,550 --> 00:01:44,370
In addition to that, we're
also looking specifically today

46
00:01:44,370 --> 00:01:47,100
when we design it for landing
safety we can't only consider

47
00:01:47,100 --> 00:01:50,050
that, we have to look at the
entire breath of the scenario.

48
00:01:50,050 --> 00:01:52,940
So, post landing egress
if there's an emergency

49
00:01:52,940 --> 00:01:56,420
for example, how do think get
out of those seats to get away

50
00:01:56,420 --> 00:01:57,570
from the emergency scenario?

51
00:01:57,570 --> 00:02:00,140
So, we don't want to solve one
problem and induce another,

52
00:02:00,140 --> 00:02:02,650
and that's why we do
as many tests as we do.

53

00:02:02,650 --> 00:02:03,380
>> Dan Huot: Okay.

54
00:02:03,380 --> 00:02:05,740
And one thing that we
learned earlier was the fact

55
00:02:05,740 --> 00:02:07,270
that the crew is fully suited.

56
00:02:07,270 --> 00:02:09,410
I mean, that's a
pretty special occasion

57
00:02:09,410 --> 00:02:11,520
for a lot of these test guys.

58
00:02:11,520 --> 00:02:12,980
What kind of suits are
they wearing today?

59
00:02:12,980 --> 00:02:14,200
They look very familiar.

60
00:02:14,200 --> 00:02:16,200
>> Dustin Gohemert: They
should look familiar.

61
00:02:16,200 --> 00:02:19,730
They're either specifically
from the Shuttle Program

62
00:02:19,730 --> 00:02:22,660
or modified versions of the
advanced crew escape suit

63
00:02:22,660 --> 00:02:23,990
that we use in the
Shuttle Program.

64
00:02:23,990 --> 00:02:25,010
And we are very fortunate

65
00:02:25,010 --> 00:02:29,370
when the Shuttle Program ended
our team inherited all the suits

66
00:02:29,370 --> 00:02:30,530
that we flew in the
Shuttle Program,

67
00:02:30,530 --> 00:02:33,460
and we're actually working
to repurpose them for Orion

68
00:02:33,460 --> 00:02:37,480
so the shell of them
is very much the same.

69
00:02:37,480 --> 00:02:40,910
And to a casual user, you may
not even know the difference,

70
00:02:40,910 --> 00:02:43,790
but internally we
modified them to work

71
00:02:43,790 --> 00:02:46,700
with plumbing that's inside
Orion to provide them air.

72
00:02:46,700 --> 00:02:48,920
It's very different than
it was in the shuttle

73
00:02:48,920 --> 00:02:51,370
>> Dan Huot: And we got
some video of Rex Walheim

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00:02:51,370 --> 00:02:53,370
in the Neutral Buoyancy
Laboratory testing

75
00:02:53,370 --> 00:02:54,370
out one of these suits.

76
00:02:54,370 --> 00:02:56,890
Now, during the shuttle
days, this was kind

77
00:02:56,890 --> 00:02:58,490
of just a launch and entry suit.

78
00:02:58,490 --> 00:03:00,610
What are some of the things
that's being designed for it

79
00:03:00,610 --> 00:03:03,390
to be potentially used in Orion?

80
00:03:03,390 --> 00:03:05,230
>> Dustin Gohemert: Well,
it's primary purpose still is

81
00:03:05,230 --> 00:03:06,610
that of a launch and entry suit.

82
00:03:06,610 --> 00:03:08,770
And when you talk about
a launch/entry suit,

83
00:03:08,770 --> 00:03:12,060
our big factor is keeping the
suit as a fully soft suit,

84
00:03:12,060 --> 00:03:13,750
so that the interface
between the person

85
00:03:13,750 --> 00:03:17,260
and the seat is non
injurious in landing in fact.

86
00:03:17,260 --> 00:03:20,510
But what we're trying to expand
it to in Orion is contingency

87
00:03:20,510 --> 00:03:22,150
and maybe even beyond
contingency

88
00:03:22,150 --> 00:03:25,460
for limited capacity extra
vehicular activity so think

89
00:03:25,460 --> 00:03:27,650
about today we use
the white EMU.

90
00:03:27,650 --> 00:03:30,030
The extra vehicular
mobility unit.

91
00:03:30,030 --> 00:03:30,880
>> Dan Huot: Very big.

92
00:03:30,880 --> 00:03:31,310
>> Dustin Gohemert: Very big.

93
00:03:31,310 --> 00:03:33,500
That suit is as big as
it is because it has lots

94
00:03:33,500 --> 00:03:35,510
of rigid mobility joints.

95
00:03:35,510 --> 00:03:36,590
This suit doesn't.

96
00:03:36,590 --> 00:03:39,220
Again, because it's designed
primarily for launch and entry.

97
00:03:39,220 --> 00:03:42,670
But what we're trying to do is
learn a little bit more how we

98
00:03:42,670 --> 00:03:46,080
can effectively use it for EVAs
and really what it goes back

99
00:03:46,080 --> 00:03:47,620
to is more like the
days of Gemini

100
00:03:47,620 --> 00:03:51,310
when we were first learning,
and that suit that Ed White wore

101
00:03:51,310 --> 00:03:54,160
for example is say the
first cousin to this suit.

102
00:03:54,160 --> 00:03:56,210
Very, very similar construction.

103
00:03:56,210 --> 00:04:00,100
And so we're stepping back to
some of our heritage to be able

104
00:04:00,100 --> 00:04:02,940
to use one suit for
multiple tasks.

105
00:04:02,940 --> 00:04:04,990
>> Dan Huot: Are there any
specific upgrades you're

106
00:04:04,990 --> 00:04:06,560
building into this suit?

107
00:04:06,560 --> 00:04:07,240
>> Dustin Gohemert: We are.

108
00:04:07,240 --> 00:04:11,770
We're trying we don't want
to limit ourselves any more

109
00:04:11,770 --> 00:04:13,950
than we have to so there
are certain design features

110
00:04:13,950 --> 00:04:16,000
that we're considering
adding to this suit.

111
00:04:16,000 --> 00:04:19,520
The testing you spoke of
at the Neutral Buoyancy Lab

112
00:04:19,520 --> 00:04:21,130
with Rex Walheim is an example.

113
00:04:21,130 --> 00:04:23,510
We're learning what features
we need to add to the suit

114
00:04:23,510 --> 00:04:25,330
to enhance it's mobility.

115
00:04:25,330 --> 00:04:27,880
That test was just a first cut.

116
00:04:27,880 --> 00:04:29,240
Here's the baseline suit.

117

00:04:29,240 --> 00:04:31,030
Yeah, let's learn
how it performs.

118
00:04:31,030 --> 00:04:33,130
In future tests we'll be
performing over the summer,

119
00:04:33,130 --> 00:04:35,500
we'll be adding things
like enhanced gloves,

120
00:04:35,500 --> 00:04:37,980
enhanced mobility, elbows
and perhaps even bearing

121
00:04:37,980 --> 00:04:41,430
in the lower arms to enhance
flexibility of that joint.

122
00:04:41,430 --> 00:04:45,210
All the while keeping in
mind how does this suit have

123
00:04:45,210 --> 00:04:47,880
to keep it's heritage for
launch and entry safety.

124
00:04:47,880 --> 00:04:50,740
So none of the things that
we add can compromise a safe

125
00:04:50,740 --> 00:04:53,080
landing because we have to
launch and land every time

126
00:04:53,080 --> 00:04:55,030
and EVA may be a more rare case.

127
00:04:55,030 --> 00:04:55,610

>> Dan Huot: Yep.

128
00:04:55,610 --> 00:04:58,400
>> Dustin Gohemert: It's
a balancing act for us.

129
00:04:58,400 --> 00:04:59,030
>> Dan Huot: Okay.

130
00:04:59,030 --> 00:05:01,620
Well just some of the more
exciting upgrades coming

131
00:05:01,620 --> 00:05:03,780
out of the Orion program
not just the vehicle,

132
00:05:03,780 --> 00:05:06,630
but the suits themselves
the astronauts will be in.

133
00:05:06,630 --> 00:05:08,470
Dustin thanks so much for
again taking a few minutes and