
PAO

1
00:00:01,900 --> 00:00:02,740
>> Amiko Kauderer: Hi welcome

2
00:00:02,740 --> 00:00:05,400
to the International Space
Station Flight Control Room.

3
00:00:05,400 --> 00:00:08,680
I am here today with a special
guest to talk to us a little bit

4
00:00:08,680 --> 00:00:11,790
about some testing that
was taking place this week

5
00:00:11,790 --> 00:00:13,220
on Monday and on Wednesday.

6
00:00:13,220 --> 00:00:15,840
It was on a Suitport.

7
00:00:15,840 --> 00:00:18,760
A Suitport is a new technology
that is being developed here

8
00:00:18,760 --> 00:00:20,440
at the NASA Johnson Spec Center

9
00:00:20,440 --> 00:00:23,590
that will eventually
allow astronauts who go

10
00:00:23,590 --> 00:00:28,720
out on a space walk to do that
without going into the air lock

11
00:00:28,720 --> 00:00:32,240
so here with us is Rob Boyle
he is the project manager

12
00:00:32,240 --> 00:00:37,730
of the Suitport and welcome
thank you for coming.

13
00:00:37,730 --> 00:00:42,470
So before we get into
the Suitport and what all

14
00:00:42,470 --> 00:00:44,680
of that is I want to
talk a little about you.

15
00:00:44,680 --> 00:00:48,060
So tell me first how in the
world did you make your way here

16
00:00:48,060 --> 00:00:52,150
at NASA and then to be working
on this cool, cool technology.

17
00:00:52,150 --> 00:00:52,940
>> Rob Boyle: Mechanical
engineer

18
00:00:52,940 --> 00:00:57,340
from Texas ANM University,
came out and got one job,

19
00:00:57,340 --> 00:01:02,680
was able to move to JSC in
1990, have worked space suits

20
00:01:02,680 --> 00:01:06,920
for about 13, 14 years, mostly
on the Life Support Backpack,

21
00:01:06,920 --> 00:01:10,990
mostly specialist on the Life
Support Backpack and then

22
00:01:10,990 --> 00:01:13,570
when return to flight came
on I worked the goo gun

23
00:01:13,570 --> 00:01:15,080
for repairing the
bottom of the ship

24
00:01:15,080 --> 00:01:18,560
and then I worked
then I've moved

25
00:01:18,560 --> 00:01:21,230
around a little I worked the
Altair Lunar Lander during the

26
00:01:21,230 --> 00:01:23,820
Constellation Phase
and now I'm working

27
00:01:23,820 --> 00:01:27,370
through the Advanced Exploration
Systems I'm working Suitport.

28
00:01:27,370 --> 00:01:29,220
>> Amiko: So you've been working

29
00:01:29,220 --> 00:01:30,820
on some really really
fascinating,

30
00:01:30,820 --> 00:01:34,200
interesting things what was it I
mean were you always a space you

31
00:01:34,200 --> 00:01:35,520
know had some interest in space

32

00:01:35,520 --> 00:01:36,930
or how did you make
your way here?

33
00:01:36,930 --> 00:01:37,880
>> Rob: I've always
had an interest

34
00:01:37,880 --> 00:01:41,960
in space yes you know anybody
who grew up or was young

35
00:01:41,960 --> 00:01:43,950
when the Apollo landings were
happening had an interest

36
00:01:43,950 --> 00:01:47,920
in space so I always had
that and once I got to JSC

37
00:01:47,920 --> 00:01:51,080
and started working on the space
suit I fell in love with EVA

38
00:01:51,080 --> 00:01:53,560
so if you look at all those
tasks they're all EVA centered,

39
00:01:53,560 --> 00:01:56,250
they all involve what would
we do while space walking.

40
00:01:56,250 --> 00:01:58,230
>> Amiko: And by EVA you're
talking about space walk,

41
00:01:58,230 --> 00:02:00,340
the extra-vehicular activity.

42
00:02:00,340 --> 00:02:03,350

Ok so now let's get
into Suitport.

43
00:02:03,350 --> 00:02:06,580
I briefly explained it but can
you go into a little more detail

44
00:02:06,580 --> 00:02:07,880
about what the Suitport is.

45
00:02:07,880 --> 00:02:11,160
>> Rob: Sure the Suitport is to
replace the traditional air lock

46
00:02:11,160 --> 00:02:14,780
on a space craft so what we can
do is we can hang the suits off

47
00:02:14,780 --> 00:02:17,970
the side or the back of a
space craft and that allows us

48
00:02:17,970 --> 00:02:21,120
to have the suits
ready, pressurized

49
00:02:21,120 --> 00:02:23,660
and the crew members can
open the space craft door,

50
00:02:23,660 --> 00:02:26,100
open the back of a suit,

51
00:02:26,100 --> 00:02:28,820
assuming it's a rear
entry suit and jump in.

52
00:02:28,820 --> 00:02:32,060
So they can jump into
the suit, close the hatch

53
00:02:32,060 --> 00:02:34,850
on the space suit, close
the hatch on the vehicle

54
00:02:34,850 --> 00:02:38,560
and very quickly depress
the space between,

55
00:02:38,560 --> 00:02:41,550
which we call a vestibule
and walk out,

56
00:02:41,550 --> 00:02:44,820
walk off the space craft so
you can imagine in an asteroid

57
00:02:44,820 --> 00:02:47,740
if they were exploring
in a small vehicle

58
00:02:47,740 --> 00:02:50,200
and they said oh I
want to get that rock.

59
00:02:50,200 --> 00:02:52,090
Instead of what we
do on space station

60
00:02:52,090 --> 00:02:53,500
where it takes a
few hours to get

61
00:02:53,500 --> 00:02:56,840
out they can just
set their drink down,

62
00:02:56,840 --> 00:02:59,450
go jump in the space
suit, go get that rock,

63
00:02:59,450 --> 00:03:02,580
put it on the back of the space
craft, back in the space craft

64
00:03:02,580 --> 00:03:04,810
and they may only be
out a total of an hour

65
00:03:04,810 --> 00:03:06,860
so that's what we're
trying to do.

66
00:03:06,860 --> 00:03:09,470
>> Amiko: So far out and
I'm really just so intrigued

67
00:03:09,470 --> 00:03:11,640
by this technology
so it's a lot of fun

68
00:03:11,640 --> 00:03:14,630
but now also there are other
people who are interested

69
00:03:14,630 --> 00:03:18,630
in this so we asked Twitter and
we have a few people on Twitter

70
00:03:18,630 --> 00:03:20,980
who came with a few questions

71
00:03:20,980 --> 00:03:23,910
and just very very simply the
first Twitter question comes

72
00:03:23,910 --> 00:03:27,450
from IBHappyhopi
How do they do that?

73
00:03:27,450 --> 00:03:30,330
>> Rob: So the way we do that is
we've designed a clamp system,

74
00:03:30,330 --> 00:03:34,190
its similar to what's used
standardly in space craft

75
00:03:34,190 --> 00:03:37,800
and sea operations as a
Marmon clamp and so that is

76
00:03:37,800 --> 00:03:39,630
where a couple of clamps come in

77
00:03:39,630 --> 00:03:42,370
and they clamp the space
suit to the vehicle.

78
00:03:42,370 --> 00:03:44,560
One of the innovative
features how we've implemented

79
00:03:44,560 --> 00:03:47,530
that clamp is we don't
have to compress an O-ring,

80
00:03:47,530 --> 00:03:51,340
our standard hatches all use
tremendous clamping forces.

81
00:03:51,340 --> 00:03:53,600
I can't do that on a light
weight space suit that I want

82
00:03:53,600 --> 00:03:56,100
to be able to move around
and walk walk on the moon,

83

00:03:56,100 --> 00:03:58,550
or be on an asteroid,
or do whatever

84
00:03:58,550 --> 00:04:01,750
so what we've done is
we've replaced that O-ring

85
00:04:01,750 --> 00:04:06,130
or that seal with something
similar to a bike inner tube

86
00:04:06,130 --> 00:04:09,840
so after we clamp it to the
space craft we inflate a seal

87
00:04:09,840 --> 00:04:12,950
against the space suit,
between the space craft

88
00:04:12,950 --> 00:04:15,510
and the space suit and that
allows us to seal the suit

89
00:04:15,510 --> 00:04:18,130
to the space craft, then we
can open the doors and come

90
00:04:18,130 --> 00:04:19,900
in so there was a
lot of innovation

91
00:04:19,900 --> 00:04:22,260
that made this possible
by a lot of people.

92
00:04:22,260 --> 00:04:24,660
>> Amiko: Wow so how long
have you been working

93

00:04:24,660 --> 00:04:28,010
on this project how long has
the project been in work?

94
00:04:28,010 --> 00:04:32,850
>> Rob: So the project Suitport
was patented in 1989 actually

95
00:04:32,850 --> 00:04:35,670
out at AIMS so it's been
around for a long time

96
00:04:35,670 --> 00:04:38,770
but it needed a home, it needed
a space craft to be on so

97
00:04:38,770 --> 00:04:41,470
when they started working
originally the lunar rover

98
00:04:41,470 --> 00:04:44,900
and now the Multi Mission
Space Exploration Vehicle

99
00:04:44,900 --> 00:04:48,710
when they started working
those vehicles we realized

100
00:04:48,710 --> 00:04:52,700
that hey we could really
change the operations we

101
00:04:52,700 --> 00:04:54,150
that the crew do in space

102
00:04:54,150 --> 00:04:56,580
and we could make exploration
really efficient if we had

103
00:04:56,580 --> 00:04:59,950

that Suitport so we put
some mock ups on the back

104
00:04:59,950 --> 00:05:02,350
of those vehicles and those
vehicles have really been able

105
00:05:02,350 --> 00:05:04,800
to show how cool it would
be to have Suitport,

106
00:05:04,800 --> 00:05:06,190
what we could do with it.

107
00:05:06,190 --> 00:05:07,990
What we're trying to do in
chamber B what we're doing

108
00:05:07,990 --> 00:05:11,350
with this week's testing is not
what would we do with Suitport

109
00:05:11,350 --> 00:05:14,380
if we had it, its can we
really make Suitport work?

110
00:05:14,380 --> 00:05:16,700
For a couple of years we tested
it assuming we could make

111
00:05:16,700 --> 00:05:17,260
it work.

112
00:05:17,260 --> 00:05:19,210
Hey what would we
do if we had it?

113
00:05:19,210 --> 00:05:20,560
Now we're really striving

114
00:05:20,560 --> 00:05:25,130
to show yes I can pressurize a
space suit against a bulk head,

115
00:05:25,130 --> 00:05:27,400
I can put a crew member
across that bulk head,

116
00:05:27,400 --> 00:05:29,830
I can separate them,
depressurize

117
00:05:29,830 --> 00:05:33,240
that pressurized seal and I can
step off the wall and we did

118
00:05:33,240 --> 00:05:35,220
that both Monday and Wednesday

119
00:05:35,220 --> 00:05:38,320
and we've done glove
boxes before

120
00:05:38,320 --> 00:05:40,950
but we've never had a human
dawn a pressurized suit

121
00:05:40,950 --> 00:05:43,080
>> Amiko: So this is the first
test that it was a manned

122
00:05:43,080 --> 00:05:45,660
because I know that we did
an unmanned testing what last

123
00:05:45,660 --> 00:05:45,980
like June

124
00:05:45,980 --> 00:05:47,500

>> Rob: Yeah a couple
of weeks ago.

125
00:05:47,500 --> 00:05:49,300
Yep we did an unmanned test.

126
00:05:49,300 --> 00:05:53,100
We put a blanking plate or just
a big aluminum plate in place

127
00:05:53,100 --> 00:05:55,760
of a space suit and we went
ahead and ran the Suitport

128
00:05:55,760 --> 00:05:58,160
through its paces, that made
sure the test team knew what

129
00:05:58,160 --> 00:06:00,700
they were doing, it
checked our procedures out

130
00:06:00,700 --> 00:06:02,320
and it made sure all
of the hardware was

131
00:06:02,320 --> 00:06:04,310
in place before we put
a human in the loop

132
00:06:04,310 --> 00:06:07,720
and then we came back this
month, we added the space suit,

133
00:06:07,720 --> 00:06:10,170
repeated all of that
without a human again

134
00:06:10,170 --> 00:06:11,820
with just the space

suit in place

135
00:06:11,820 --> 00:06:14,730
and then got prototypes
basically the Z1

136
00:06:14,730 --> 00:06:17,910
and then we dropped a human in
and we've had 4 test subjects

137
00:06:17,910 --> 00:06:20,300
so far and we've had
a lot of fun with it.

138
00:06:20,300 --> 00:06:23,860
>> Amiko: Wow very well and so
I assume the testing went well.

139
00:06:23,860 --> 00:06:25,360
>> Rob: The testing did go well.

140
00:06:25,360 --> 00:06:28,500
The one thing we found we
learned it's harder to get

141
00:06:28,500 --> 00:06:30,520
out of the space
suit than we expected

142
00:06:30,520 --> 00:06:33,100
and so we have another test
series we're going to try

143
00:06:33,100 --> 00:06:36,070
in September and we'll have
different space suit docking

144
00:06:36,070 --> 00:06:37,920
aids for that test
so that we're able

145
00:06:37,920 --> 00:06:40,570
to assist the crew
members much much better

146
00:06:40,570 --> 00:06:42,280
in getting out of the suit.

147
00:06:42,280 --> 00:06:42,510
>> Amiko: Ok.

148
00:06:42,510 --> 00:06:46,550
Well great and so that leads me
to the next Twitter question.

149
00:06:46,550 --> 00:06:49,450
This Twitter question is not
one question, it's like a lot

150
00:06:49,450 --> 00:06:50,910
of them so be prepared.

151
00:06:50,910 --> 00:06:53,640
I don't know how they got
this in 140 characters

152
00:06:53,640 --> 00:06:55,080
but we'll go with this one.

153
00:06:55,080 --> 00:06:59,750
Will the visor have
a heads up display?

154
00:06:59,750 --> 00:07:02,910
Why are we currently
fitted in an airlock

155
00:07:02,910 --> 00:07:06,080
and what are the other benefits

of the Suitport; safety,

156
00:07:06,080 --> 00:07:12,180
convenience, time, and is the
suit used more than one mission?

157
00:07:12,180 --> 00:07:14,240
>> Rob: Ah very good

158
00:07:14,240 --> 00:07:19,070
so the first one why are
we fitted in an air lock?

159
00:07:19,070 --> 00:07:21,640
So for like space shuttle or
space station you don't want

160
00:07:21,640 --> 00:07:23,330
to depress the entire
space craft,

161
00:07:23,330 --> 00:07:26,870
you want to depress a very
small area of the space craft

162
00:07:26,870 --> 00:07:28,580
and let them go EVA from that.

163
00:07:28,580 --> 00:07:31,450
You also don't want all the crew
members to have to put on a suit

164
00:07:31,450 --> 00:07:34,420
so like on space station where
we might have or a space shuttle

165
00:07:34,420 --> 00:07:35,530
where we might have
7 crew member

166
00:07:35,530 --> 00:07:38,360
in the space craft I only
want to send 2 people outside

167
00:07:38,360 --> 00:07:40,050
so I put those 2
people in the air lock,

168
00:07:40,050 --> 00:07:42,560
I'm able to depress
that and go out.

169
00:07:42,560 --> 00:07:45,910
One shuttle, the suits actually,

170
00:07:45,910 --> 00:07:49,410
I believe we built 18 suits
total and we've done we did all

171
00:07:49,410 --> 00:07:53,880
of the shuttle missions and
supported all of the ISS USCVAs

172
00:07:53,880 --> 00:07:58,040
with those 18 that's Life
Support Backpacks that we built.

173
00:07:58,040 --> 00:08:02,240
The suits last about 8 years
and we do numerous EVAs on them

174
00:08:02,240 --> 00:08:05,770
through those 8 years so
that's for shuttle station.

175
00:08:05,770 --> 00:08:09,580
For exploration it'll depend
on the mission, it'll depend

176

00:08:09,580 --> 00:08:12,120
on whether we have the down
mast to bring the suits back,

177
00:08:12,120 --> 00:08:15,210
or whether the easiest
thing to do is you know

178
00:08:15,210 --> 00:08:18,180
like on Apollo they
kick the life supports

179
00:08:18,180 --> 00:08:21,470
out the vehicle just before
they took off and left them

180
00:08:21,470 --> 00:08:22,670
on the surface of the moon.

181
00:08:22,670 --> 00:08:25,110
I've seen some pictures of them
laying there it's kind of neat.

182
00:08:25,110 --> 00:08:25,520
>> Amiko: Wow.

183
00:08:25,520 --> 00:08:28,480
>> Rob: and so we may have to
do that for exploration missions

184
00:08:28,480 --> 00:08:30,310
where we're mask
constrained or we may be able

185
00:08:30,310 --> 00:08:32,320
to bring the suits back.

186
00:08:32,320 --> 00:08:33,950
What were the other two?

187
00:08:33,950 --> 00:08:34,430
There were four.

188
00:08:34,430 --> 00:08:37,870
>> Amiko: So we have
also well we were talking

189
00:08:37,870 --> 00:08:40,330
about the benefits of
safety convenience and time.

190
00:08:40,330 --> 00:08:41,020
What are the benefits

191
00:08:41,020 --> 00:08:43,150
of the Suitport why not
just use the air lock

192
00:08:43,150 --> 00:08:44,080
that we already have.

193
00:08:44,080 --> 00:08:45,200
>> Rob: Well what
we're really striving

194
00:08:45,200 --> 00:08:48,030
to do we think we can
get them out of the craft

195
00:08:48,030 --> 00:08:50,860
in under 30 minutes
compared to the 4 or 5 hours

196
00:08:50,860 --> 00:08:52,510
that it takes us to
get out right now

197
00:08:52,510 --> 00:08:54,120
with conventional air locks

198
00:08:54,120 --> 00:08:58,690
and conventional non-rear entry
suits so we need space craft

199
00:08:58,690 --> 00:09:02,810
to use a 8PSI atmosphere instead
of the 14, 7 we have here

200
00:09:02,810 --> 00:09:06,550
and on station but if we can get
an 8 PSI vehicle then we think

201
00:09:06,550 --> 00:09:08,100
we can get them out
in under 30 minutes

202
00:09:08,100 --> 00:09:11,600
and then our second goal is

203
00:09:11,600 --> 00:09:14,090
to reduce contamination
brought back into the vehicle.

204
00:09:14,090 --> 00:09:16,260
You've probably seen
pictures on Apollo

205
00:09:16,260 --> 00:09:18,800
when they explored the moon
how much dirt came back

206
00:09:18,800 --> 00:09:20,060
on the suits, how much
[inaudible] came back

207
00:09:20,060 --> 00:09:23,630
with the suits, you can
imagine in an asteroid

208
00:09:23,630 --> 00:09:27,580
where there wouldn't be gravity
to resettle any dirt or regula

209
00:09:27,580 --> 00:09:31,560
if we saw that you might have
an electrostatic cloud of dust

210
00:09:31,560 --> 00:09:32,610
around you, if you brought

211
00:09:32,610 --> 00:09:34,880
that into an air lock its
coming into the space craft.

212
00:09:34,880 --> 00:09:37,720
If I use a Suitport the only
piece of the suit that comes

213
00:09:37,720 --> 00:09:42,010
in is the nice slick back part
of the life support system

214
00:09:42,010 --> 00:09:44,840
so I significantly reduce the
contamination that comes in

215
00:09:44,840 --> 00:09:47,010
and you can think
of that in terms

216
00:09:47,010 --> 00:09:51,250
of where we've had contamination
like hypergolic fuels or ammonia

217
00:09:51,250 --> 00:09:53,370
on space station, the
same thing applies.

218

00:09:53,370 --> 00:09:56,480
I can significantly reduce
the surface area that I have

219
00:09:56,480 --> 00:10:00,000
to worry about in coming back
into the space craft so I get

220
00:10:00,000 --> 00:10:04,080
that and then consumables, the
smallest air lock we've had

221
00:10:04,080 --> 00:10:06,470
on shuttle is about
150 cubic feet

222
00:10:06,470 --> 00:10:09,180
so on shuttle we just
let that gas go to space.

223
00:10:09,180 --> 00:10:11,360
On space station we have
a pump that pumps it back

224
00:10:11,360 --> 00:10:16,690
into space station with Suitport
the volume between the suit

225
00:10:16,690 --> 00:10:20,320
and the space craft that I have
to depress is about 1 cubic feet

226
00:10:20,320 --> 00:10:24,380
so say I put 2 people out that's
2 cubic feet, that's a factor

227
00:10:24,380 --> 00:10:29,040
of 75 so I significantly reduce
that gas and I don't really care

228

00:10:29,040 --> 00:10:31,160
if you're talking about
whether I vent it into space,

229
00:10:31,160 --> 00:10:33,790
or whether I use power to pump
it back into the space craft,

230
00:10:33,790 --> 00:10:35,480
either way I saved
that consumable.

231
00:10:35,480 --> 00:10:38,370
So I can significantly
save consumables.

232
00:10:38,370 --> 00:10:41,040
We get 1 side benefit
of being able to go out

233
00:10:41,040 --> 00:10:43,950
and do very very short
EVAs, what we find

234
00:10:43,950 --> 00:10:47,420
with the 7 hour EVAs sometimes
maybe something will be rubbing

235
00:10:47,420 --> 00:10:49,730
somebody's elbow or something
and by the time they come

236
00:10:49,730 --> 00:10:52,330
in it's a hot spot and they
might need to put a band aid

237
00:10:52,330 --> 00:10:53,300
on it or something like that.

238
00:10:53,300 --> 00:10:55,500

What we find over
in the water tank is

239
00:10:55,500 --> 00:10:57,620
if I can limit their
EVA duration,

240
00:10:57,620 --> 00:10:59,690
then those hot spots never
develop because they're not

241
00:10:59,690 --> 00:11:04,110
in the suit for 8 hours, 9 hours
and so if I can get them in

242
00:11:04,110 --> 00:11:06,950
and out that quick they start
seeing a hot spot they can put a

243
00:11:06,950 --> 00:11:08,930
piece of tape on it
before they get in the suit

244
00:11:08,930 --> 00:11:12,570
and we'll alleviate that
whole irritation to the crew.

245
00:11:12,570 --> 00:11:14,620
>> Amiko: I understand the
space suits aren't the most

246
00:11:14,620 --> 00:11:17,930
comfortable garments to wear so.

247
00:11:17,930 --> 00:11:19,620
>> Rob: The space suit
people would like you

248
00:11:19,620 --> 00:11:22,050
to not know you're wearing

a suit, that would be ideal

249
00:11:22,050 --> 00:11:22,900
but we're not there yet.

250
00:11:22,900 --> 00:11:25,740
>> Amiko: Yeah exactly so and
I think the last part of this

251
00:11:25,740 --> 00:11:27,600
and I think you did
answer this was basically

252
00:11:27,600 --> 00:11:30,400
if the suit could be used
for more than 1 mission.

253
00:11:30,400 --> 00:11:32,290
>> Rob: Yes.

254
00:11:32,290 --> 00:11:34,320
>> Amiko: Congratulations
on the testing

255
00:11:34,320 --> 00:11:35,000
>> Rob: Oh thank you.

256
00:11:35,000 --> 00:11:37,660
>> Amiko: and the good results
that you have and continue with

257
00:11:37,660 --> 00:11:39,490
but let's go ahead and
talk to me a little bit

258
00:11:39,490 --> 00:11:41,660
about what's next
for the Suitport.

259

00:11:41,660 --> 00:11:45,910
>> Rob: So we built the Suitport
based on the Marmon clamp and we

260
00:11:45,910 --> 00:11:48,400
like it, it's our second
generation Suitport we've built

261
00:11:48,400 --> 00:11:51,870
based on Marmon clamp and we
about halved the part count

262
00:11:51,870 --> 00:11:53,810
between the first generation
and the second generation

263
00:11:53,810 --> 00:11:56,970
but while we've been doing this
someone came up with a good idea

264
00:11:56,970 --> 00:12:00,080
for what we call a
pneumatic flipper Suitport

265
00:12:00,080 --> 00:12:05,830
and that Suitport cuts the
part count again maybe by 75%

266
00:12:05,830 --> 00:12:07,280
so we've been building that.

267
00:12:07,280 --> 00:12:08,970
It's in the lab being
assembled now.

268
00:12:08,970 --> 00:12:11,710
We're going to come back in
August and test that Suitport

269
00:12:11,710 --> 00:12:15,680

and we're going to decide which
clamping mechanism we prefer.

270
00:12:15,680 --> 00:12:18,100
When we're done with
that we're looking

271
00:12:18,100 --> 00:12:21,850
to right now the testing
we're doing has the chamber

272
00:12:21,850 --> 00:12:27,270
at about 21,000 feet altitude
and the man lock at sea level,

273
00:12:27,270 --> 00:12:29,550
that gives us about an 8
PSI delta across the suit.

274
00:12:29,550 --> 00:12:32,220
What I want to do is come
back and take the chamber

275
00:12:32,220 --> 00:12:34,670
to space vacuum and
hold the man lock

276
00:12:34,670 --> 00:12:38,420
at 8PSI space craft pressure and
go ahead and repeat this test

277
00:12:38,420 --> 00:12:42,950
with the crew member at vacuum
and with the chamber at vacuum

278
00:12:42,950 --> 00:12:45,940
and that will truly
show hey we're ready

279
00:12:45,940 --> 00:12:48,350

to start integrating
with a space craft.

280
00:12:48,350 --> 00:12:49,860
Assuming we can do that,

281
00:12:49,860 --> 00:12:55,170
our advanced exploration
systems Advanced Extra-Vehicular

282
00:12:55,170 --> 00:12:59,710
Mobility Unit Group is trying
to have a prototype suit ready

283
00:12:59,710 --> 00:13:01,180
that can go to a thermal vacuum,

284
00:13:01,180 --> 00:13:04,810
that's where we pull the chamber
walls down to minus 300 degrees,

285
00:13:04,810 --> 00:13:07,890
we put heat lamps in to
simulate different environments

286
00:13:07,890 --> 00:13:10,420
and we have the crew
member walk into the chamber

287
00:13:10,420 --> 00:13:13,430
and it's a big deal,
it's almost as hard

288
00:13:13,430 --> 00:13:16,660
as a space EVA except we don't
have to get there and we'd

289
00:13:16,660 --> 00:13:18,780
like to see Suitport be part
of that test when they do

290
00:13:18,780 --> 00:13:22,250
that in say 2016 or 2017.

291
00:13:22,250 --> 00:13:23,460
>> Amiko: Wow fascinating.

292
00:13:23,460 --> 00:13:26,870
Extra-vehicular Mobility
Group that's a mouthful.

293
00:13:26,870 --> 00:13:28,540
Only at NASA.

294
00:13:28,540 --> 00:13:30,490
>> Rob: So I would
have said it AESEMU.

295
00:13:30,490 --> 00:13:31,540
Oh well.

296
00:13:31,540 --> 00:13:33,100
>> Amiko: So again
congratulations.

297
00:13:33,100 --> 00:13:35,930
A lot of work has been done,
a lot of work still to do.