
esa
COLUMBUS
esa

1
00:00:04,390 --> 00:00:02,550
well good afternoon everybody and

2
00:00:05,990 --> 00:00:04,400
welcome to our eva

3
00:00:08,629 --> 00:00:06,000
status briefing here at the johnson

4
00:00:10,629 --> 00:00:08,639
space center i'm dan hewitt uh obviously

5
00:00:12,470 --> 00:00:10,639
it's already been a very busy time for

6
00:00:15,190 --> 00:00:12,480
the crew on board the station and here

7
00:00:16,710 --> 00:00:15,200
on the ground on 2015.

8
00:00:18,710 --> 00:00:16,720
and it's not about slow down it's about

9
00:00:20,790 --> 00:00:18,720
to get a lot busier with three upcoming

10
00:00:22,550 --> 00:00:20,800
spacewalks here to learn a little bit

11
00:00:24,230 --> 00:00:22,560
more about what's ahead again for the

12
00:00:26,550 --> 00:00:24,240
crews and all of our teams down here on

13
00:00:28,550 --> 00:00:26,560

the ground i'm joined by kenny todd the

14
00:00:30,630 --> 00:00:28,560
international space station operations

15
00:00:33,350 --> 00:00:30,640
integration manager

16
00:00:35,350 --> 00:00:33,360
tomas gonzalez torres the expedition 42

17
00:00:37,430 --> 00:00:35,360
lead flight director then we have our

18
00:00:39,590 --> 00:00:37,440
trio of our lead spacewalk officers

19
00:00:43,670 --> 00:00:39,600
starting with karina eversley who will

20
00:00:46,950 --> 00:00:43,680
be the lead spacewalk officer for eva 29

21
00:00:50,790 --> 00:00:46,960
corona the officer for eva 30 and arthur

22
00:00:52,950 --> 00:00:50,800
thomason the officer for eva 31

23
00:00:54,950 --> 00:00:52,960
as usual we hear from each of them and

24
00:00:56,150 --> 00:00:54,960
then open up for everybody's questions

25
00:00:58,950 --> 00:00:56,160
so kenny why don't you go ahead and

26
00:01:01,830 --> 00:00:58,960
start us off thanks dan as dan said it's

27
00:01:02,709 --> 00:01:01,840
been a very busy start to the to the

28
00:01:05,670 --> 00:01:02,719
year

29
00:01:06,950 --> 00:01:05,680
um we had a spacex five launch earlier

30
00:01:08,630 --> 00:01:06,960
in the year

31
00:01:11,590 --> 00:01:08,640
just uh just since the beginning of

32
00:01:14,870 --> 00:01:11,600
february alone we've we've unbirthed uh

33
00:01:16,230 --> 00:01:14,880
the dragon it arrived home safely all of

34
00:01:18,710 --> 00:01:16,240
the

35
00:01:21,190 --> 00:01:18,720
cargo has been returned turned over to

36
00:01:22,870 --> 00:01:21,200
the to the owners the the science has

37
00:01:25,510 --> 00:01:22,880
been delivered to all the different

38
00:01:26,630 --> 00:01:25,520

scientists so all very good news on that

39
00:01:28,950 --> 00:01:26,640
front

40
00:01:32,069 --> 00:01:28,960
this past saturday morning

41
00:01:35,190 --> 00:01:32,079
for the final time we doc undocked the

42
00:01:36,710 --> 00:01:35,200
the issa built autonomous transfer

43
00:01:38,710 --> 00:01:36,720
vehicle which

44
00:01:40,789 --> 00:01:38,720
again that was the last

45
00:01:42,630 --> 00:01:40,799
last vehicle that was in that fleet and

46
00:01:45,109 --> 00:01:42,640
so i would like to take this opportunity

47
00:01:47,270 --> 00:01:45,119
to congratulate our esa colleagues that

48
00:01:49,910 --> 00:01:47,280
was an outstanding program

49
00:01:52,310 --> 00:01:49,920
that they led that particular vehicle

50
00:01:54,950 --> 00:01:52,320
serviced this program extremely well for

51
00:01:56,630 --> 00:01:54,960
a lot of years and so our hats are off

52
00:01:58,630 --> 00:01:56,640
to them

53
00:02:00,789 --> 00:01:58,640
fresh on the heels of that undock our

54
00:02:03,749 --> 00:02:00,799
russian colleagues on

55
00:02:07,270 --> 00:02:03,759
on tuesday morning very early houston

56
00:02:09,350 --> 00:02:07,280
time launched 58 progress and and that

57
00:02:11,589 --> 00:02:09,360
uh particular vehicle docked uh to the

58
00:02:14,229 --> 00:02:11,599
aft end of station uh yesterday around

59
00:02:16,869 --> 00:02:14,239
noon time here in in houston uh flawless

60
00:02:19,350 --> 00:02:16,879
no issues and uh and so good again we're

61
00:02:21,190 --> 00:02:19,360
we're glad to have that uh that vehicle

62
00:02:23,350 --> 00:02:21,200
aboard as well

63
00:02:25,270 --> 00:02:23,360

when we look forward

64
00:02:26,550 --> 00:02:25,280
particularly on the eba front if you

65
00:02:28,710 --> 00:02:26,560
look out through the rest of the year

66
00:02:30,550 --> 00:02:28,720
we've got about seven evas

67
00:02:32,790 --> 00:02:30,560
on the schedule three of what you're

68
00:02:35,830 --> 00:02:32,800
going to hear about today

69
00:02:37,110 --> 00:02:35,840
the the real goal as we we start to turn

70
00:02:39,830 --> 00:02:37,120
the corner

71
00:02:42,869 --> 00:02:39,840
on the eva front is to is to try to get

72
00:02:44,470 --> 00:02:42,879
us ready to uh to prepare for the

73
00:02:45,750 --> 00:02:44,480
arrival of some of our commercial crew

74
00:02:47,430 --> 00:02:45,760
vehicles

75
00:02:48,869 --> 00:02:47,440
you hear a lot about what's going on

76
00:02:50,949 --> 00:02:48,879
with the development of those those

77
00:02:53,589 --> 00:02:50,959
vehicles at the different uh

78
00:02:55,750 --> 00:02:53,599
vendor facilities but uh but on the

79
00:02:57,350 --> 00:02:55,760
station we also have to do a lot of work

80
00:02:59,670 --> 00:02:57,360
to be to be ready to receive those

81
00:03:01,750 --> 00:02:59,680
vehicles and so uh so you'll be hearing

82
00:03:03,350 --> 00:03:01,760
about at least on the eva side of things

83
00:03:06,390 --> 00:03:03,360
uh where we're going

84
00:03:08,710 --> 00:03:06,400
here with these next three evas

85
00:03:12,229 --> 00:03:08,720
looking forward past these evas we'll

86
00:03:13,990 --> 00:03:12,239
start preparing for the return of butch

87
00:03:15,430 --> 00:03:14,000
elena and alexander

88
00:03:17,589 --> 00:03:15,440

that's going to happen around the middle

89
00:03:19,990 --> 00:03:17,599
of march time frame and then a couple of

90
00:03:23,589 --> 00:03:20,000
weeks later we're going to welcome soyuz

91
00:03:25,190 --> 00:03:23,599
42s which will uh with along with it to

92
00:03:28,630 --> 00:03:25,200
bring us our first

93
00:03:31,430 --> 00:03:28,640
one-year expedition crew and scott kelly

94
00:03:33,030 --> 00:03:31,440
and mikhail kornienko so we're very

95
00:03:34,869 --> 00:03:33,040
excited to have those guys on board i

96
00:03:36,470 --> 00:03:34,879
think we'll learn a lot i think the

97
00:03:39,190 --> 00:03:36,480
research team is going to learn a lot

98
00:03:41,990 --> 00:03:39,200
and and the lessons from that will will

99
00:03:44,710 --> 00:03:42,000
pay big dividends as we go forth as a as

100
00:03:47,509 --> 00:03:44,720
a as a program and as a nation and and

101
00:03:48,789 --> 00:03:47,519
try to explore beyond low earth orbit so

102
00:03:50,550 --> 00:03:48,799
so we're looking forward to getting

103
00:03:52,470 --> 00:03:50,560
those guys on board

104
00:03:53,910 --> 00:03:52,480
shortly after they arrive we'll uh we'll

105
00:03:57,270 --> 00:03:53,920
be looking to

106
00:03:59,589 --> 00:03:57,280
to bring the spacex six uh dragon on

107
00:04:01,030 --> 00:03:59,599
board around the middle to end of april

108
00:04:02,710 --> 00:04:01,040
still working through the details of the

109
00:04:05,110 --> 00:04:02,720
schedule but but that'll be roughly the

110
00:04:07,030 --> 00:04:05,120
time frame that we're talking about and

111
00:04:08,390 --> 00:04:07,040
we'll we'll have a very involved heavy

112
00:04:10,309 --> 00:04:08,400
science mission

113
00:04:11,670 --> 00:04:10,319

with spacex so

114
00:04:15,910 --> 00:04:11,680
with that

115
00:04:17,430 --> 00:04:15,920
busy spring time

116
00:04:19,189 --> 00:04:17,440
when we start to turn our eyes towards

117
00:04:20,310 --> 00:04:19,199
the summer and the fall

118
00:04:23,830 --> 00:04:20,320
we're really going to put a lot of

119
00:04:26,390 --> 00:04:23,840
attention and focus on on on expanding

120
00:04:28,950 --> 00:04:26,400
and in in some ways reassembling part of

121
00:04:31,510 --> 00:04:28,960
space station to allow ourselves to

122
00:04:33,430 --> 00:04:31,520
to establish some birthing ports for all

123
00:04:36,070 --> 00:04:33,440
the different commercial vehicles that

124
00:04:37,110 --> 00:04:36,080
will be coming to station

125
00:04:38,550 --> 00:04:37,120
the

126
00:04:40,629 --> 00:04:38,560
in in general

127
00:04:43,990 --> 00:04:40,639
what we're trying to do is establish two

128
00:04:45,590 --> 00:04:44,000
birthing ports for each of the of the

129
00:04:47,590 --> 00:04:45,600
types of cargo vehicles that we're

130
00:04:49,189 --> 00:04:47,600
having we'll have cargo vehicles we'll

131
00:04:51,270 --> 00:04:49,199
have crew vehicles

132
00:04:53,590 --> 00:04:51,280
and we want to make sure that we have

133
00:04:57,030 --> 00:04:53,600
primary and backup ports for for each

134
00:04:59,030 --> 00:04:57,040
one of those and so um as we start to

135
00:05:00,070 --> 00:04:59,040
transform station a little bit you're in

136
00:05:02,070 --> 00:05:00,080
the middle of the year you're going to

137
00:05:04,230 --> 00:05:02,080
see us do some robotics work we're going

138
00:05:06,710 --> 00:05:04,240

to take the the permanent multi-purpose

139
00:05:08,710 --> 00:05:06,720
module that's on the the nader

140
00:05:11,110 --> 00:05:08,720
side of of node 1 and we're going to

141
00:05:12,230 --> 00:05:11,120
move it up to the to the node 3 forward

142
00:05:13,430 --> 00:05:12,240
area

143
00:05:14,950 --> 00:05:13,440
and what that's going to do is that's

144
00:05:17,670 --> 00:05:14,960
going to open up the node 1 neighbor

145
00:05:19,110 --> 00:05:17,680
nader as a cargo vehicle

146
00:05:21,670 --> 00:05:19,120
birthing port

147
00:05:23,749 --> 00:05:21,680
and and we have to do that because

148
00:05:25,909 --> 00:05:23,759
the node 2 zenith

149
00:05:28,230 --> 00:05:25,919
port which is currently our backup port

150
00:05:30,469 --> 00:05:28,240
for for berthing cargo vehicles we're

151
00:05:32,070 --> 00:05:30,479
going to transform that and and make

152
00:05:33,189 --> 00:05:32,080
that one of our our ports that we're

153
00:05:34,790 --> 00:05:33,199
going to put

154
00:05:36,790 --> 00:05:34,800
the crude vehicles on when we start

155
00:05:38,870 --> 00:05:36,800
receiving those uh here in the next

156
00:05:40,469 --> 00:05:38,880
couple of years and so

157
00:05:42,070 --> 00:05:40,479
a lot of what's going to be going on

158
00:05:44,070 --> 00:05:42,080
through the ebas

159
00:05:46,070 --> 00:05:44,080
as well as on the internal side is is

160
00:05:49,029 --> 00:05:46,080
starting to outfit

161
00:05:52,150 --> 00:05:49,039
the the front end of pma2 we're going to

162
00:05:54,870 --> 00:05:52,160
move pma3 move it over to that node 2

163
00:05:56,469 --> 00:05:54,880

zenith location and that's where that's

164
00:05:58,710 --> 00:05:56,479
where we're going to be prepared to

165
00:06:02,309 --> 00:05:58,720
receive crew vehicles is on no two

166
00:06:03,909 --> 00:06:02,319
forward and no 2 zenith so again i say

167
00:06:05,550 --> 00:06:03,919
all that to say we're doing a lot of

168
00:06:07,830 --> 00:06:05,560
doing a lot of

169
00:06:10,230 --> 00:06:07,840
reconfiguration this year so in addition

170
00:06:12,309 --> 00:06:10,240
to some some long duration science and

171
00:06:13,990 --> 00:06:12,319
some uh you know

172
00:06:15,749 --> 00:06:14,000
cargo ops and all the other things we

173
00:06:18,150 --> 00:06:15,759
really are trying to to take station

174
00:06:21,110 --> 00:06:18,160
into this next phase in support

175
00:06:23,830 --> 00:06:21,120
of the of the commercial industries and

176
00:06:25,990 --> 00:06:23,840
and and providers

177
00:06:27,830 --> 00:06:26,000
but uh as i said earlier it all kind of

178
00:06:31,110 --> 00:06:27,840
gets started here in the next couple of

179
00:06:33,909 --> 00:06:31,120
weeks uh with this series of ebas uh so

180
00:06:36,790 --> 00:06:33,919
far uh the preparations are going

181
00:06:38,309 --> 00:06:36,800
i think reasonably well for the evas

182
00:06:41,029 --> 00:06:38,319
i did want to mention to you that we

183
00:06:43,670 --> 00:06:41,039
have what i consider to be one piece of

184
00:06:45,350 --> 00:06:43,680
non-standard open work in general when

185
00:06:47,110 --> 00:06:45,360
you're several days out from an eva

186
00:06:49,029 --> 00:06:47,120
you're still trying to tidy things up

187
00:06:51,830 --> 00:06:49,039
and get the products done and and get

188
00:06:53,589 --> 00:06:51,840

ready to go and go out to hatch

189
00:06:55,830 --> 00:06:53,599
so we tend to divide things in terms of

190
00:06:58,150 --> 00:06:55,840
standard and non-standard

191
00:07:01,430 --> 00:06:58,160
and so we do have what i consider to be

192
00:07:03,909 --> 00:07:01,440
one non-standard piece of open work

193
00:07:05,589 --> 00:07:03,919
a couple of months ago on orbit uh

194
00:07:08,469 --> 00:07:05,599
during one of our suit maintenance

195
00:07:10,469 --> 00:07:08,479
activities uh we we had uh one of the

196
00:07:12,390 --> 00:07:10,479
suits and we were trying to do a loop

197
00:07:13,589 --> 00:07:12,400
scrub activity with it the

198
00:07:17,589 --> 00:07:13,599
the

199
00:07:19,909 --> 00:07:17,599
that suit did not spin up

200
00:07:22,150 --> 00:07:19,919
and as most of you know that's that's

201
00:07:24,309 --> 00:07:22,160
the same area of concern that we had

202
00:07:26,550 --> 00:07:24,319
back in 2013

203
00:07:28,870 --> 00:07:26,560
when we we had the issue with the with

204
00:07:31,029 --> 00:07:28,880
the water in the helmet so

205
00:07:32,390 --> 00:07:31,039
obviously it gets a lot of attention and

206
00:07:33,749 --> 00:07:32,400
people want to try to understand what's

207
00:07:37,029 --> 00:07:33,759
going on

208
00:07:39,430 --> 00:07:37,039
uh so so we we did some troubleshooting

209
00:07:41,270 --> 00:07:39,440
um at the time our our best guess was

210
00:07:43,909 --> 00:07:41,280
that there was mechanical binding in

211
00:07:45,749 --> 00:07:43,919
that fan pumps up the pump the the pan

212
00:07:48,950 --> 00:07:45,759
itself wouldn't turn

213
00:07:51,589 --> 00:07:48,960

we put a new uh fan pumps up in that we

214
00:07:53,510 --> 00:07:51,599
had on orbit and and uh and it's been

215
00:07:55,830 --> 00:07:53,520
working um

216
00:07:59,110 --> 00:07:55,840
with no issues since that point

217
00:08:00,070 --> 00:07:59,120
um subsequent to that particular failure

218
00:08:01,589 --> 00:08:00,080
um

219
00:08:03,589 --> 00:08:01,599
in january

220
00:08:05,350 --> 00:08:03,599
we had a second suit we were doing the

221
00:08:07,110 --> 00:08:05,360
same type of activity and encountered

222
00:08:08,230 --> 00:08:07,120
the same type of failure in the fan pump

223
00:08:09,510 --> 00:08:08,240
sub area

224
00:08:12,309 --> 00:08:09,520
and uh

225
00:08:14,469 --> 00:08:12,319
that that got us thinking uh you know

226
00:08:15,909 --> 00:08:14,479
what's changed what what what's

227
00:08:16,869 --> 00:08:15,919
happening it appeared to be the same

228
00:08:20,070 --> 00:08:16,879
type of

229
00:08:23,270 --> 00:08:20,080
mechanical binding issue and we did some

230
00:08:25,270 --> 00:08:23,280
more more testing on orbit we couldn't

231
00:08:28,070 --> 00:08:25,280
directly get into the fan pumps up it's

232
00:08:30,070 --> 00:08:28,080
all a single unit

233
00:08:32,469 --> 00:08:30,080
and so we didn't get into it but we we

234
00:08:33,990 --> 00:08:32,479
kind of got enough data in and around it

235
00:08:35,589 --> 00:08:34,000
through our testing on orbit to say that

236
00:08:38,790 --> 00:08:35,599
we still felt like it was mechanical

237
00:08:41,029 --> 00:08:38,800
binding we took the opportunity

238
00:08:42,949 --> 00:08:41,039

in fact very late in the spacex flow to

239
00:08:44,310 --> 00:08:42,959
uh to pull that particular fan pumps up

240
00:08:45,990 --> 00:08:44,320
along with the one

241
00:08:48,550 --> 00:08:46,000
that we that we pulled out in in

242
00:08:51,350 --> 00:08:48,560
december and returned those uh those two

243
00:08:53,350 --> 00:08:51,360
fan pump steps on on spacex five

244
00:08:54,389 --> 00:08:53,360
uh since that time

245
00:08:56,230 --> 00:08:54,399
the team

246
00:08:57,829 --> 00:08:56,240
responsible for

247
00:08:59,990 --> 00:08:57,839
the engineering on our suits and our

248
00:09:03,030 --> 00:09:00,000
engineering teams here have been working

249
00:09:06,829 --> 00:09:03,040
exhaustively to to try to

250
00:09:18,470 --> 00:09:08,550
the

251
00:09:19,750 --> 00:09:18,480
issue uh was that perhaps we might be

252
00:09:22,070 --> 00:09:19,760
getting water

253
00:09:24,870 --> 00:09:22,080
in some other places of the fam pump sep

254
00:09:27,190 --> 00:09:24,880
and and and as they

255
00:09:29,030 --> 00:09:27,200
began to to look at

256
00:09:31,829 --> 00:09:29,040
particular parts of the fan pumps up in

257
00:09:33,350 --> 00:09:31,839
particular the bearings um it all

258
00:09:35,269 --> 00:09:33,360
started to make sense we're seeing

259
00:09:37,110 --> 00:09:35,279
binding and at the same time we're

260
00:09:39,110 --> 00:09:37,120
seeing when they got inside them they're

261
00:09:41,750 --> 00:09:39,120
seeing some corrosion there so so all

262
00:09:43,670 --> 00:09:41,760
the evidence is lining up to say that

263
00:09:45,590 --> 00:09:43,680

that we're getting water in and around

264
00:09:47,509 --> 00:09:45,600
uh some of the some of the bearings

265
00:09:50,470 --> 00:09:47,519
inside the fan pump sub

266
00:09:53,350 --> 00:09:50,480
if you look at the unit itself it's the

267
00:09:56,389 --> 00:09:53,360
the the fan and and the pump seder

268
00:09:58,389 --> 00:09:56,399
separator are attached to a to a drive

269
00:10:00,470 --> 00:09:58,399
shaft that run back to the motor and

270
00:10:03,190 --> 00:10:00,480
there's two sets of bearings and and the

271
00:10:04,630 --> 00:10:03,200
bearings that are closest to the fan are

272
00:10:06,069 --> 00:10:04,640
the ones that we're seeing this

273
00:10:07,269 --> 00:10:06,079
corrosion on

274
00:10:08,870 --> 00:10:07,279
and when you look at some of the things

275
00:10:09,910 --> 00:10:08,880
that we've done

276
00:10:12,230 --> 00:10:09,920
since

277
00:10:13,269 --> 00:10:12,240
2013 when we had the water and helmet

278
00:10:17,350 --> 00:10:13,279
issue

279
00:10:22,069 --> 00:10:19,750
tests that we're doing samples uh if you

280
00:10:24,630 --> 00:10:22,079
will that allow us to get some insight

281
00:10:25,350 --> 00:10:24,640
into how the water chemistry is within

282
00:10:28,630 --> 00:10:25,360
the

283
00:10:30,550 --> 00:10:28,640
and we do that as part of our normal

284
00:10:32,550 --> 00:10:30,560
maintenance activities and what we're

285
00:10:34,310 --> 00:10:32,560
discovering is it looks like

286
00:10:36,949 --> 00:10:34,320
that with the number of times we're

287
00:10:38,630 --> 00:10:36,959
we're powering on this fan pumps up uh

288
00:10:40,389 --> 00:10:38,640

in doing so we're actually putting a

289
00:10:43,509 --> 00:10:40,399
little bit more water in each time we're

290
00:10:45,430 --> 00:10:43,519
doing that and and over a period of time

291
00:10:47,910 --> 00:10:45,440
we're putting enough water in there that

292
00:10:50,470 --> 00:10:47,920
that once you you you

293
00:10:52,230 --> 00:10:50,480
disengage the suit and power it down

294
00:10:53,990 --> 00:10:52,240
that that water sits in that area and

295
00:10:56,790 --> 00:10:54,000
the fan pumps up and it eventually

296
00:10:57,829 --> 00:10:56,800
migrates into into these bearings and so

297
00:11:00,790 --> 00:10:57,839
um

298
00:11:02,230 --> 00:11:00,800
at this point that's uh that's

299
00:11:03,750 --> 00:11:02,240
we're pretty certain that's what's going

300
00:11:05,110 --> 00:11:03,760
on that's the method by which we're

301
00:11:07,269 --> 00:11:05,120
getting the extra water in the suit we

302
00:11:08,870 --> 00:11:07,279
never had this issue before but we're

303
00:11:10,870 --> 00:11:08,880
putting more more water in this

304
00:11:13,829 --> 00:11:10,880
particular area the fan pumps up now as

305
00:11:16,710 --> 00:11:13,839
a result of of uh doing the extra

306
00:11:18,949 --> 00:11:16,720
sampling and so so we're off to uh to

307
00:11:21,350 --> 00:11:18,959
take a fresh look at how we how we

308
00:11:23,990 --> 00:11:21,360
ensure the water chemistry uh stays

309
00:11:25,509 --> 00:11:24,000
stays good we think we've we've uh we've

310
00:11:27,750 --> 00:11:25,519
come a long way in our understanding of

311
00:11:29,910 --> 00:11:27,760
that and feel very confident that

312
00:11:31,910 --> 00:11:29,920
that the water quality itself is no

313
00:11:33,990 --> 00:11:31,920

longer an issue and now we just need to

314
00:11:35,590 --> 00:11:34,000
go back and and and re-look at our

315
00:11:37,430 --> 00:11:35,600
sampling techniques and make sure that

316
00:11:39,350 --> 00:11:37,440
we're we're sound there in our thinking

317
00:11:41,750 --> 00:11:39,360
and that we're we're not doing anything

318
00:11:43,829 --> 00:11:41,760
to to further damage

319
00:11:45,269 --> 00:11:43,839
the pump steps that we that we have on

320
00:11:46,630 --> 00:11:45,279
orbit

321
00:11:48,630 --> 00:11:46,640
so where does that leave us now going

322
00:11:50,710 --> 00:11:48,640
into these evas

323
00:11:52,550 --> 00:11:50,720
the two suits that we have on orbit that

324
00:11:54,069 --> 00:11:52,560
we're going out eva with

325
00:11:56,069 --> 00:11:54,079
at this point

326
00:11:58,069 --> 00:11:56,079
have operated every time we turn we've

327
00:11:59,430 --> 00:11:58,079
we've we've turned them on

328
00:12:01,430 --> 00:11:59,440
they're

329
00:12:02,790 --> 00:12:01,440
we're looking at the data constantly

330
00:12:05,110 --> 00:12:02,800
every time we turn them on and put them

331
00:12:06,069 --> 00:12:05,120
through their paces

332
00:12:07,590 --> 00:12:06,079
there's

333
00:12:09,590 --> 00:12:07,600
at least on one of the suits some

334
00:12:12,230 --> 00:12:09,600
evidence if you will that there may be

335
00:12:14,230 --> 00:12:12,240
some corrosion in that bearing area and

336
00:12:16,150 --> 00:12:14,240
so the team

337
00:12:17,670 --> 00:12:16,160
at the united technologies and our

338
00:12:21,430 --> 00:12:17,680

engineering guys here are working very

339
00:12:23,590 --> 00:12:21,440
hard to to understand um

340
00:12:25,190 --> 00:12:23,600
you know what the what the level of

341
00:12:27,829 --> 00:12:25,200
corrosion might be and whether or not it

342
00:12:30,470 --> 00:12:27,839
has any impact on our ability to

343
00:12:32,230 --> 00:12:30,480
to keep the fan operating during the

344
00:12:34,310 --> 00:12:32,240
during the eba itself

345
00:12:35,750 --> 00:12:34,320
all indicators are based on all the data

346
00:12:37,990 --> 00:12:35,760
from the ground testing as well as the

347
00:12:39,590 --> 00:12:38,000
testing of the suits on orbit is that

348
00:12:41,750 --> 00:12:39,600
that we'll work our way through this and

349
00:12:44,870 --> 00:12:41,760
these these suits are going to be okay

350
00:12:46,550 --> 00:12:44,880
but that said is we have a

351
00:12:48,310 --> 00:12:46,560
some open work left to do that's the

352
00:12:50,790 --> 00:12:48,320
non-standard part of this that we have

353
00:12:54,230 --> 00:12:50,800
to get get worked out over the next few

354
00:12:55,590 --> 00:12:54,240
days here and at the end of the day

355
00:12:57,350 --> 00:12:55,600
you know we're going to be data driven

356
00:12:58,949 --> 00:12:57,360
we'll do these evas when the timing's

357
00:12:59,670 --> 00:12:58,959
right when we're sure that we got suits

358
00:13:01,670 --> 00:12:59,680
that

359
00:13:03,670 --> 00:13:01,680
we have high confidence we can go out go

360
00:13:04,949 --> 00:13:03,680
out the hatch with and and do the the

361
00:13:08,470 --> 00:13:04,959
tasks

362
00:13:10,470 --> 00:13:08,480
going to be easy the ones that we're

363
00:13:11,670 --> 00:13:10,480

talking about here and so we want to

364
00:13:13,910 --> 00:13:11,680
ensure that

365
00:13:15,670 --> 00:13:13,920
that we put ourselves in a position for

366
00:13:18,629 --> 00:13:15,680
success when we when we do go out to

367
00:13:20,949 --> 00:13:18,639
hatch so anyway i'm very very confident

368
00:13:22,870 --> 00:13:20,959
that we'll we'll get there with that

369
00:13:24,389 --> 00:13:22,880
one thing i do want to want to make sure

370
00:13:25,990 --> 00:13:24,399
that i touch on with you guys because

371
00:13:27,829 --> 00:13:26,000
again we talked about the fan pumps up

372
00:13:30,230 --> 00:13:27,839
and we talked about the the water and

373
00:13:31,030 --> 00:13:30,240
helmet issue

374
00:13:33,110 --> 00:13:31,040
when

375
00:13:35,030 --> 00:13:33,120
with the water in the helmet that was a

376
00:13:37,910 --> 00:13:35,040
totally different root cause issue that

377
00:13:39,509 --> 00:13:37,920
was an issue with with the port holes

378
00:13:41,110 --> 00:13:39,519
getting clogged up in the in the water

379
00:13:42,949 --> 00:13:41,120
separator that was due to the water

380
00:13:44,230 --> 00:13:42,959
chemistry issue that we talked about

381
00:13:45,509 --> 00:13:44,240
earlier

382
00:13:47,670 --> 00:13:45,519
and through that

383
00:13:49,750 --> 00:13:47,680
through that clogging water was allowed

384
00:13:53,030 --> 00:13:49,760
to get into the to the vent flow that

385
00:13:54,710 --> 00:13:53,040
that goes up into into the helmet that

386
00:13:57,110 --> 00:13:54,720
is not an issue here what we're talking

387
00:13:57,910 --> 00:13:57,120
about is a failure of the pump to start

388
00:14:00,870 --> 00:13:57,920

up

389
00:14:02,470 --> 00:14:00,880
that in and of itself is not a a water

390
00:14:05,829 --> 00:14:02,480
type of event where you could get water

391
00:14:07,110 --> 00:14:05,839
in a helmet in fact our our ops

392
00:14:08,470 --> 00:14:07,120
team here will tell you this is

393
00:14:10,150 --> 00:14:08,480
something that they train for they

394
00:14:12,230 --> 00:14:10,160
understand that that

395
00:14:14,790 --> 00:14:12,240
you know they have cue cards checklist

396
00:14:16,949 --> 00:14:14,800
cuff list for for when a fan pump fails

397
00:14:19,189 --> 00:14:16,959
off so this is you know a fan pump could

398
00:14:22,069 --> 00:14:19,199
fail for a variety of reasons we've just

399
00:14:23,590 --> 00:14:22,079
found one here based on on this

400
00:14:24,629 --> 00:14:23,600
corrosion that's getting in the system

401
00:14:26,310 --> 00:14:24,639
so

402
00:14:28,230 --> 00:14:26,320
again we'll go work our way through that

403
00:14:30,389 --> 00:14:28,240
and we'll uh we'll uh we'll be data

404
00:14:31,670 --> 00:14:30,399
driven we'll do the eba when

405
00:14:33,990 --> 00:14:31,680
when it's ready at this point i'm going

406
00:14:35,829 --> 00:14:34,000
to do an immt tomorrow morning

407
00:14:37,110 --> 00:14:35,839
we'll see where the different teams are

408
00:14:38,949 --> 00:14:37,120
where we're at on our data we're

409
00:14:40,550 --> 00:14:38,959
continuing to meet this afternoon we'll

410
00:14:45,269 --> 00:14:40,560
we'll

411
00:14:47,269 --> 00:14:45,279
morning and

412
00:14:49,990 --> 00:14:47,279
figure out when the right time to go do

413
00:14:51,750 --> 00:14:50,000

these ebas are but but i'm optimistic we

414
00:14:53,030 --> 00:14:51,760
will we'll be going out the hatch very

415
00:14:55,030 --> 00:14:53,040
soon here

416
00:14:56,870 --> 00:14:55,040
and with that i'll i'll pass it over to

417
00:14:57,670 --> 00:14:56,880
tomas

418
00:14:59,990 --> 00:14:57,680
okay

419
00:15:02,550 --> 00:15:00,000
all right thanks a lot kenny um so i am

420
00:15:05,350 --> 00:15:02,560
tomas gonzalez torres increment uh lead

421
00:15:07,030 --> 00:15:05,360
flight director for increment 42.

422
00:15:08,389 --> 00:15:07,040
um i'm going to give a really high big

423
00:15:10,470 --> 00:15:08,399
picture and then i'll let the experts

424
00:15:13,110 --> 00:15:10,480
here talk in details about the specific

425
00:15:15,829 --> 00:15:13,120
evas these evas are going to be numbers

426
00:15:18,069 --> 00:15:15,839
29 30 and 31.

427
00:15:20,949 --> 00:15:18,079
all of them expected to have egress

428
00:15:23,030 --> 00:15:20,959
start time right around 6 15

429
00:15:25,590 --> 00:15:23,040
central daylight time

430
00:15:27,509 --> 00:15:25,600
and each expect it to last right around

431
00:15:29,189 --> 00:15:27,519
six and a half hours

432
00:15:32,150 --> 00:15:29,199
all three of them will be in u.s space

433
00:15:34,150 --> 00:15:32,160
suits and will be egressed from the u.s

434
00:15:35,189 --> 00:15:34,160
quest to airlock

435
00:15:41,670 --> 00:15:35,199
the

436
00:15:43,110 --> 00:15:41,680
barry wilmore we call him butch he's

437
00:15:44,710 --> 00:15:43,120
going to be ev1

438
00:15:48,470 --> 00:15:44,720

for eva's

439
00:15:49,670 --> 00:15:48,480
29 and 30 and then terry verts and he

440
00:15:51,350 --> 00:15:49,680
will be

441
00:15:54,470 --> 00:15:51,360
ev-1 on

442
00:15:57,509 --> 00:15:54,480
the third eva in the series eva

443
00:15:58,710 --> 00:15:57,519
31 or spacewalk number 31.

444
00:16:02,389 --> 00:15:58,720
this will be

445
00:16:05,670 --> 00:16:02,399
butch's second third and fourth evas and

446
00:16:08,150 --> 00:16:05,680
terry's first second and third evas

447
00:16:10,150 --> 00:16:08,160
on the inside of the space station

448
00:16:11,910 --> 00:16:10,160
samantha christopher reddy

449
00:16:14,150 --> 00:16:11,920
the other usos crew member will be

450
00:16:16,710 --> 00:16:14,160
helping to suit up the crew before they

451
00:16:19,269 --> 00:16:16,720
go outside and she will also be helping

452
00:16:22,949 --> 00:16:19,279
on the second eva in the series number

453
00:16:26,150 --> 00:16:22,959
30 with the robotics operations

454
00:16:28,389 --> 00:16:26,160
the lead flight directors for these evas

455
00:16:30,870 --> 00:16:28,399
are going to be tony saccacci

456
00:16:32,949 --> 00:16:30,880
for the the first and third eva or

457
00:16:35,749 --> 00:16:32,959
spacewalks in the series and then greg

458
00:16:37,509 --> 00:16:35,759
whitney will be the lead flight director

459
00:16:41,189 --> 00:16:37,519
excuse me for

460
00:16:43,269 --> 00:16:41,199
for the second eva in the series

461
00:16:45,269 --> 00:16:43,279
as kenny mentioned

462
00:16:46,870 --> 00:16:45,279
overall over the next several months the

463
00:16:49,590 --> 00:16:46,880

iss is going to be going through some

464
00:16:50,710 --> 00:16:49,600
reconfiguration

465
00:16:53,269 --> 00:16:50,720
a couple of the items that we're going

466
00:16:56,389 --> 00:16:53,279
to be doing are specifically relocating

467
00:16:59,189 --> 00:16:56,399
the the pmm module

468
00:17:01,269 --> 00:16:59,199
from the node 1 nader to the node 3

469
00:17:04,630 --> 00:17:01,279
forward so it's going from the blue spot

470
00:17:06,309 --> 00:17:04,640
in the picture to the green spot

471
00:17:09,510 --> 00:17:06,319
and then the other relocation is going

472
00:17:12,390 --> 00:17:09,520
to be of the pma3 moving from node 3

473
00:17:13,429 --> 00:17:12,400
ports to node 2 zenith again from blue

474
00:17:19,669 --> 00:17:13,439
spot

475
00:17:20,710 --> 00:17:19,679
to helping again provide new birthing

476
00:17:22,949 --> 00:17:20,720
ports

477
00:17:24,309 --> 00:17:22,959
for for future vehicles

478
00:17:25,350 --> 00:17:24,319
in addition

479
00:17:27,990 --> 00:17:25,360
to the

480
00:17:29,430 --> 00:17:28,000
the pma relocations on the ends of those

481
00:17:31,350 --> 00:17:29,440
pmas

482
00:17:33,029 --> 00:17:31,360
in the near future some ideas or

483
00:17:34,710 --> 00:17:33,039
international docking adapters are going

484
00:17:37,430 --> 00:17:34,720
to be flown up and there's going to be

485
00:17:39,029 --> 00:17:37,440
attached again to the pmas themselves

486
00:17:40,789 --> 00:17:39,039
and these evas

487
00:17:43,350 --> 00:17:40,799
their spacewalks coming up are

488
00:17:46,310 --> 00:17:43,360

specifically supporting

489
00:17:48,789 --> 00:17:46,320
the external reconfiguration of the iss

490
00:17:51,510 --> 00:17:48,799
so that we can support

491
00:17:53,110 --> 00:17:51,520
these objectives in these new birthing

492
00:17:53,909 --> 00:17:53,120
ports

493
00:17:57,990 --> 00:17:53,919
the

494
00:18:00,630 --> 00:17:58,000
upcoming

495
00:18:02,390 --> 00:18:00,640
three spacewalks are

496
00:18:05,350 --> 00:18:02,400
pretty focused on

497
00:18:07,510 --> 00:18:05,360
on a couple of things for eva 29 it's

498
00:18:10,390 --> 00:18:07,520
all going to be ida cable routing then

499
00:18:13,669 --> 00:18:10,400
eva 30. we'll complete the cable routing

500
00:18:15,270 --> 00:18:13,679
along with some ssrms

501
00:18:18,150 --> 00:18:15,280
the end effector

502
00:18:20,950 --> 00:18:18,160
lubrication and then also on

503
00:18:23,350 --> 00:18:20,960
eva 31 is going to be the the c2v2 or

504
00:18:25,830 --> 00:18:23,360
the common communications for visiting

505
00:18:27,909 --> 00:18:25,840
vehicles cable routing

506
00:18:29,270 --> 00:18:27,919
and with that that's the high level i'll

507
00:18:33,669 --> 00:18:29,280
go ahead and pass it on to karina

508
00:18:37,909 --> 00:18:35,909
thanks tomas i'm uh karine eversley i'll

509
00:18:40,070 --> 00:18:37,919
be the lead eva officer for the first

510
00:18:41,990 --> 00:18:40,080
eva in the series i'd also like to

511
00:18:44,789 --> 00:18:42,000
acknowledge the rest of my team i have

512
00:18:46,710 --> 00:18:44,799
scott ray sandy fletcher brian alpert

513
00:18:49,110 --> 00:18:46,720

and ernie bell that will be working with

514
00:18:52,070 --> 00:18:49,120
me during the ava

515
00:18:53,110 --> 00:18:52,080
the goal of us eva 29 is to

516
00:18:55,990 --> 00:18:53,120
provide

517
00:18:58,070 --> 00:18:56,000
power and data for the international

518
00:18:59,510 --> 00:18:58,080
docking adapter number one that's going

519
00:19:01,510 --> 00:18:59,520
to be installed on the forward end of

520
00:19:03,830 --> 00:19:01,520
pma number two

521
00:19:06,150 --> 00:19:03,840
later this year this will be the most

522
00:19:09,110 --> 00:19:06,160
complicated cable routing task that we

523
00:19:10,870 --> 00:19:09,120
have performed by eva on iss to date and

524
00:19:12,470 --> 00:19:10,880
i should state that there is an equally

525
00:19:14,150 --> 00:19:12,480
complicated set of cable routing that

526
00:19:17,830 --> 00:19:14,160
has to be done internal to the space

527
00:19:23,350 --> 00:19:20,150
this photo here shows the forward end

528
00:19:24,870 --> 00:19:23,360
cone of node 2 and the pma2 and that's

529
00:19:25,590 --> 00:19:24,880
the overview of the work site that we'll

530
00:19:28,710 --> 00:19:25,600
be

531
00:19:31,110 --> 00:19:28,720
working in for the entire eva

532
00:19:32,870 --> 00:19:31,120
you can see two of the micrometeoroid

533
00:19:34,789 --> 00:19:32,880
orbital debris shields that are pointed

534
00:19:36,950 --> 00:19:34,799
out there the crew will have to remove

535
00:19:38,710 --> 00:19:36,960
those two shields in order to make

536
00:19:39,909 --> 00:19:38,720
several connections

537
00:19:41,590 --> 00:19:39,919
and this will be the first time that

538
00:19:43,350 --> 00:19:41,600

we've opened this type of end cone

539
00:19:45,270 --> 00:19:43,360
shield although we have opened a

540
00:19:46,470 --> 00:19:45,280
circumferential shield of this type in

541
00:19:48,310 --> 00:19:46,480
the past

542
00:19:49,830 --> 00:19:48,320
and the connections underneath these

543
00:19:52,470 --> 00:19:49,840
shields were never expected to be

544
00:19:53,590 --> 00:19:52,480
operated by eva crewmembers

545
00:19:56,070 --> 00:19:53,600
and so they were designed with a

546
00:19:57,590 --> 00:19:56,080
different type of a connector

547
00:19:59,909 --> 00:19:57,600
one that's commonly used inside the

548
00:20:01,590 --> 00:19:59,919
space station instead of our typical eva

549
00:20:03,510 --> 00:20:01,600
connector and i have a couple of

550
00:20:04,710 --> 00:20:03,520
examples to show you so

551
00:20:06,950 --> 00:20:04,720
this is the

552
00:20:08,870 --> 00:20:06,960
standard eva connector

553
00:20:10,470 --> 00:20:08,880
that we use and you operate it by

554
00:20:13,750 --> 00:20:10,480
pulling a lever back

555
00:20:15,510 --> 00:20:13,760
and then separating the two halves

556
00:20:17,590 --> 00:20:15,520
realign the two halves and push the

557
00:20:19,990 --> 00:20:17,600
lever forward and it was designed

558
00:20:22,789 --> 00:20:20,000
to be more easily operated by somebody

559
00:20:24,310 --> 00:20:22,799
in a spacesuit glove

560
00:20:25,669 --> 00:20:24,320
the other connectors that we will have

561
00:20:28,070 --> 00:20:25,679
to use

562
00:20:31,510 --> 00:20:28,080
on this eva

563
00:20:32,950 --> 00:20:31,520

require a 360 degree rotation of a

564
00:20:34,789 --> 00:20:32,960
collar

565
00:20:38,470 --> 00:20:34,799
and then in order to mate them you have

566
00:20:40,630 --> 00:20:38,480
to actually align the keying features

567
00:20:43,110 --> 00:20:40,640
which can be a little tricky to do

568
00:20:45,590 --> 00:20:43,120
and rotate the the collar back and that

569
00:20:47,270 --> 00:20:45,600
rotation is difficult to do

570
00:20:49,190 --> 00:20:47,280
in the gloves as well as all the

571
00:20:52,710 --> 00:20:49,200
alignment that's required of that type

572
00:20:57,590 --> 00:20:55,270
the crew will be making five of that

573
00:20:59,590 --> 00:20:57,600
type of connector connection under these

574
00:21:01,590 --> 00:20:59,600
shields four under the port shield and

575
00:21:03,190 --> 00:21:01,600
one under the starboard shield and

576
00:21:04,789 --> 00:21:03,200
although this will be the first time

577
00:21:06,870 --> 00:21:04,799
that the

578
00:21:08,630 --> 00:21:06,880
iss eva crew has had to operate this

579
00:21:10,470 --> 00:21:08,640
type of connector we have

580
00:21:11,909 --> 00:21:10,480
uh used these connectors before on the

581
00:21:13,830 --> 00:21:11,919
hubble space telescope servicing

582
00:21:16,549 --> 00:21:13,840
missions and actually if the crew does

583
00:21:19,510 --> 00:21:16,559
have difficulty with these connections

584
00:21:21,909 --> 00:21:19,520
we have a hubble designed tool that's

585
00:21:23,830 --> 00:21:21,919
basically just a spring-loaded set of

586
00:21:31,590 --> 00:21:23,840
connector pliers that we can use to get

587
00:21:34,870 --> 00:21:32,630
okay

588
00:21:36,710 --> 00:21:34,880

and i think i have another graphic that

589
00:21:37,830 --> 00:21:36,720
shows the the view of what the cabling

590
00:21:41,350 --> 00:21:37,840
will look like in its final

591
00:21:43,270 --> 00:21:41,360
configuration when the ida is in place

592
00:21:45,190 --> 00:21:43,280
one thing to point out here are the two

593
00:21:47,590 --> 00:21:45,200
connector panels on the ida you can see

594
00:21:49,669 --> 00:21:47,600
one on the starboard zenith quadrant

595
00:21:51,510 --> 00:21:49,679
which is on the right hand side of the

596
00:21:53,190 --> 00:21:51,520
picture and then there's a second one

597
00:21:54,789 --> 00:21:53,200
directly nader that's just out of view

598
00:21:56,549 --> 00:21:54,799
here

599
00:21:58,549 --> 00:21:56,559
and we will be stowing the ends of our

600
00:22:00,070 --> 00:21:58,559
cables on the pma near those two

601
00:22:03,350 --> 00:22:00,080
locations so they'll be waiting there

602
00:22:05,669 --> 00:22:03,360
for when the ida arrives

603
00:22:07,510 --> 00:22:05,679
for some fun facts on the cables that

604
00:22:10,149 --> 00:22:07,520
will be routing on this eva there are 10

605
00:22:11,590 --> 00:22:10,159
cables total that branch into 21

606
00:22:13,510 --> 00:22:11,600
different legs

607
00:22:15,190 --> 00:22:13,520
this is the set of cables in one of the

608
00:22:17,750 --> 00:22:15,200
bags that you see

609
00:22:19,350 --> 00:22:17,760
so there's a total of 364 feet of cable

610
00:22:21,830 --> 00:22:19,360
that the crew will be routing

611
00:22:23,830 --> 00:22:21,840
between the first two evas

612
00:22:26,230 --> 00:22:23,840
and the longest individual run of cable

613
00:22:28,230 --> 00:22:26,240

the crew will deploy on this eba is 43

614
00:22:31,190 --> 00:22:28,240
feet it happens to be the the second one

615
00:22:32,789 --> 00:22:31,200
that's colored purple in this view

616
00:22:34,390 --> 00:22:32,799
to help the crew keep track of all the

617
00:22:35,909 --> 00:22:34,400
different cables and the different legs

618
00:22:39,029 --> 00:22:35,919
we actually added colored patches

619
00:22:40,950 --> 00:22:39,039
periodically along the cables

620
00:22:42,870 --> 00:22:40,960
and we do use those colors extensively

621
00:22:44,789 --> 00:22:42,880
in our procedures and the graphics that

622
00:22:47,029 --> 00:22:44,799
we use as well as the movie that you'll

623
00:22:48,549 --> 00:22:47,039
see in just a moment

624
00:22:50,950 --> 00:22:48,559
the cables will be transported to the

625
00:22:53,190 --> 00:22:50,960
work site in specially designed bags and

626
00:22:55,110 --> 00:22:53,200
each bag has three layers inside and

627
00:22:57,430 --> 00:22:55,120
each layer has several straps to hold

628
00:22:59,830 --> 00:22:57,440
all the different legs of the cables

629
00:23:01,830 --> 00:22:59,840
we packed the cable bags on the ground

630
00:23:03,510 --> 00:23:01,840
with the cable legs going in according

631
00:23:06,470 --> 00:23:03,520
to the order in which we need to deploy

632
00:23:12,630 --> 00:23:07,990
okay and with that i will start the

633
00:23:17,669 --> 00:23:15,110
okay so on this first eva butch wilmore

634
00:23:19,510 --> 00:23:17,679
is going to be ev1

635
00:23:23,110 --> 00:23:19,520
and he'll egress the airlock first

636
00:23:24,310 --> 00:23:23,120
wearing the suit with the red stripes

637
00:23:26,149 --> 00:23:24,320
he'll bring out a large bundle

638
00:23:28,950 --> 00:23:26,159

consisting of the ida cable bag and a

639
00:23:31,110 --> 00:23:28,960
crew lock bag and then terry will egress

640
00:23:34,310 --> 00:23:31,120
with the pure white suit and carrying an

641
00:23:38,630 --> 00:23:36,630
which will translate up the c to spur

642
00:23:41,029 --> 00:23:38,640
and over to the port zena side of the

643
00:23:42,710 --> 00:23:41,039
destiny lab

644
00:23:44,549 --> 00:23:42,720
and then to the forward end cone of the

645
00:23:46,149 --> 00:23:44,559
harmony node

646
00:23:48,950 --> 00:23:46,159
and that of course is using the handrail

647
00:23:50,950 --> 00:23:48,960
path you see blinking there

648
00:23:52,710 --> 00:23:50,960
meanwhile terry will translate around

649
00:23:55,430 --> 00:23:52,720
the perimeter of external stowage

650
00:23:58,070 --> 00:23:55,440
platform number two

651
00:24:05,269 --> 00:23:58,080
and along the starboard side of destiny

652
00:24:13,029 --> 00:24:07,190
and once there both crew members will

653
00:24:18,149 --> 00:24:15,269
and the ida cable bags near the work

654
00:24:19,510 --> 00:24:18,159
site

655
00:24:21,830 --> 00:24:19,520
and they'll then spend some time

656
00:24:23,909 --> 00:24:21,840
installing wire tie restraints on the

657
00:24:25,190 --> 00:24:23,919
pma2 along the routes that the cables

658
00:24:26,310 --> 00:24:25,200
will follow throughout the rest of the

659
00:24:28,710 --> 00:24:26,320
eva

660
00:24:30,549 --> 00:24:28,720
you can see in this video from the

661
00:24:32,789 --> 00:24:30,559
training in the neutral buoyancy lab

662
00:24:34,630 --> 00:24:32,799
they're wrapping wire ties around

663
00:24:36,390 --> 00:24:34,640

handrails and different things

664
00:24:37,590 --> 00:24:36,400
that we can then use to restrain the

665
00:24:39,350 --> 00:24:37,600
cables

666
00:24:41,909 --> 00:24:39,360
finally butch will move some of the

667
00:24:43,909 --> 00:24:41,919
existing pma2 cabling to get it out of

668
00:24:45,510 --> 00:24:43,919
the way for removal of the first shield

669
00:24:50,789 --> 00:24:45,520
you can see that it's routed across the

670
00:24:54,070 --> 00:24:52,310
so butch and terry will work together to

671
00:24:56,230 --> 00:24:54,080
release the three bolts holding the

672
00:24:57,269 --> 00:24:56,240
porch shield in place and move it out of

673
00:24:59,350 --> 00:24:57,279
the way

674
00:25:01,750 --> 00:24:59,360
and terry will open the port ida cable

675
00:25:03,350 --> 00:25:01,760
bag

676
00:25:05,350 --> 00:25:03,360
which will disconnect the four existing

677
00:25:07,110 --> 00:25:05,360
cables under the shield which previously

678
00:25:08,549 --> 00:25:07,120
provided services for the space shuttle

679
00:25:10,710 --> 00:25:08,559
and still do provide the heater power

680
00:25:13,110 --> 00:25:10,720
for pma2

681
00:25:23,909 --> 00:25:13,120
one by one terry will hand him four new

682
00:25:26,950 --> 00:25:25,590
and on this graphic here you can see on

683
00:25:28,870 --> 00:25:26,960
the left side is the current

684
00:25:30,710 --> 00:25:28,880
configuration with cir red circles

685
00:25:32,789 --> 00:25:30,720
around the four that uh which will

686
00:25:34,630 --> 00:25:32,799
disconnect and on the right side you can

687
00:25:36,310 --> 00:25:34,640
see the four new ida cables connected

688
00:25:37,750 --> 00:25:36,320

with the light blue and the dark blue

689
00:25:39,269 --> 00:25:37,760
cables are actually routed underneath

690
00:25:40,549 --> 00:25:39,279
the hand rails

691
00:25:42,870 --> 00:25:40,559
and the other two are routed past the

692
00:25:44,710 --> 00:25:42,880
handrails and in that way the cables

693
00:25:46,149 --> 00:25:44,720
actually fit into gaps on either side of

694
00:25:48,310 --> 00:25:46,159
the handrail so they can exit from

695
00:25:49,750 --> 00:25:48,320
underneath the shield

696
00:25:51,510 --> 00:25:49,760
so once all four cables have been

697
00:25:53,350 --> 00:25:51,520
connected the crew will reinstall the

698
00:25:54,230 --> 00:25:53,360
shield and then translate to the other

699
00:25:56,789 --> 00:25:54,240
side

700
00:25:58,870 --> 00:25:56,799
where they will swap rolls

701
00:26:02,070 --> 00:25:58,880
which will open the cable bag

702
00:26:05,669 --> 00:26:02,080
they'll work together to open the shield

703
00:26:07,510 --> 00:26:05,679
terry will disconnect the existing cable

704
00:26:10,470 --> 00:26:07,520
and butch will hand him the new ida

705
00:26:15,669 --> 00:26:10,480
cable to connect

706
00:26:19,510 --> 00:26:17,350
and before leaving the starboard cable

707
00:26:21,590 --> 00:26:19,520
bag butch will retrieve a cable from it

708
00:26:25,269 --> 00:26:21,600
and bring it to the port side of harmony

709
00:26:28,549 --> 00:26:25,279
where he'll attach it to a handrail

710
00:26:30,470 --> 00:26:28,559
and begin uncoiling it he'll first

711
00:26:32,070 --> 00:26:30,480
follow the handrail path you see

712
00:26:32,710 --> 00:26:32,080
highlighted in yellow

713
00:26:36,630 --> 00:26:32,720

to

714
00:26:39,029 --> 00:26:36,640
lab where he'll make two connections

715
00:26:39,830 --> 00:26:39,039
then he'll come back forward and stow a

716
00:26:42,149 --> 00:26:39,840
leg

717
00:26:45,110 --> 00:26:42,159
that will ultimately go up pma3 towards

718
00:26:47,029 --> 00:26:45,120
item number two later on

719
00:26:49,750 --> 00:26:47,039
and finally he'll take the remaining leg

720
00:26:51,269 --> 00:26:49,760
and uncoil it as he moves forward

721
00:26:52,710 --> 00:26:51,279
securing the cable

722
00:26:55,909 --> 00:26:52,720
in the wire ties that were installed at

723
00:27:00,230 --> 00:26:57,269
the remaining coil of cable will be

724
00:27:01,990 --> 00:27:00,240
stowed on pma2 until ida one arrives

725
00:27:06,710 --> 00:27:02,000
and that's the longest of the the cables

726
00:27:10,549 --> 00:27:08,630
meanwhile terry will begin unpacking and

727
00:27:11,830 --> 00:27:10,559
routing cables from the port cable bag

728
00:27:14,070 --> 00:27:11,840
starting with the two cables that

729
00:27:21,430 --> 00:27:14,080
restore power and telemetry for the pma2

730
00:27:26,870 --> 00:27:22,950
and he'll be making the two connections

731
00:27:29,029 --> 00:27:26,880
that you see there labeled as p1 and p2

732
00:27:31,190 --> 00:27:29,039
now each of these two cables has a leg

733
00:27:33,190 --> 00:27:31,200
that continues forward towards the

734
00:27:37,750 --> 00:27:33,200
forward end of pma2 one of them goes

735
00:27:40,870 --> 00:27:39,430
and one goes nader

736
00:27:42,389 --> 00:27:40,880
and these are stowed near those

737
00:27:47,750 --> 00:27:42,399
locations i pointed out earlier where

738
00:27:51,830 --> 00:27:49,510

so for the remainder of the eva butch

739
00:27:54,230 --> 00:27:51,840
will deploy the cables that follow the

740
00:27:56,230 --> 00:27:54,240
port nader route

741
00:27:59,110 --> 00:27:56,240
and terry will deploy cables that follow

742
00:28:00,389 --> 00:27:59,120
a zenith or starboard path

743
00:28:02,149 --> 00:28:00,399
and you'll see that we just continue

744
00:28:03,669 --> 00:28:02,159
stowing the cables on the pma near where

745
00:28:05,669 --> 00:28:03,679
those connector panels will be and they

746
00:28:07,750 --> 00:28:05,679
they tend to follow sort of highways and

747
00:28:15,269 --> 00:28:07,760
so that's the route that we put the wire

748
00:28:18,950 --> 00:28:17,029
the final set of cables that butch will

749
00:28:21,029 --> 00:28:18,960
stow are three legs that will ultimately

750
00:28:23,029 --> 00:28:21,039
go to item number two

751
00:28:32,549 --> 00:28:23,039
and once we have those stowed that will

752
00:28:37,430 --> 00:28:34,470
and during that time terry finishes his

753
00:28:40,310 --> 00:28:37,440
last cable on the starboard side

754
00:28:42,789 --> 00:28:40,320
and that cable has an ida one leg

755
00:28:48,149 --> 00:28:42,799
and an ida ii leg that gets stowed on

756
00:28:51,669 --> 00:28:50,070
at this point there will be two cables

757
00:28:53,909 --> 00:28:51,679
remaining in the starboard cable bag

758
00:28:55,669 --> 00:28:53,919
which will be deployed on the second eva

759
00:28:58,710 --> 00:28:55,679
and sarah will be providing the details

760
00:29:00,070 --> 00:28:58,720
on those in a few moments

761
00:29:02,630 --> 00:29:00,080
the crew will pack up their crew lock

762
00:29:04,389 --> 00:29:02,640
bags and the port ida cable bag will

763
00:29:09,510 --> 00:29:04,399

leave the starboard ida cable bag there

764
00:29:14,310 --> 00:29:10,870
and the crew will follow their original

765
00:29:16,149 --> 00:29:14,320
translation pat path back to the airlock

766
00:29:18,870 --> 00:29:16,159
if we are ahead on the timeline on this

767
00:29:20,870 --> 00:29:18,880
day we will go ahead and and finish as

768
00:29:22,470 --> 00:29:20,880
much of the cable routing as time allows

769
00:29:27,750 --> 00:29:22,480
and that so that's our only get ahead

770
00:29:31,190 --> 00:29:29,590
so that covers the first eva in the

771
00:29:33,190 --> 00:29:31,200
series and i'll hand it over to sarah

772
00:29:35,510 --> 00:29:33,200
corona to talk about the second

773
00:29:38,149 --> 00:29:35,520
thank you karina i am sarah corona i'm

774
00:29:40,549 --> 00:29:38,159
the the lead spacewalk officer for eva

775
00:29:41,830 --> 00:29:40,559
30. i'm also like to recognize the folks

776
00:29:45,190 --> 00:29:41,840
who will be in the back room for this

777
00:29:48,230 --> 00:29:45,200
eva farooq sabor and ali bakletti will

778
00:29:51,110 --> 00:29:48,240
be on the task side and brian alpert and

779
00:29:53,590 --> 00:29:51,120
paul dumb will be on the system side

780
00:29:56,149 --> 00:29:53,600
and as it's been mentioned

781
00:29:59,350 --> 00:29:56,159
butch wilmore is going to be ev1 for the

782
00:30:01,430 --> 00:29:59,360
cva and terry burch is going to be ev2

783
00:30:04,470 --> 00:30:01,440
with samantha christopher ready she is

784
00:30:06,630 --> 00:30:04,480
going to be the iv crew member

785
00:30:08,470 --> 00:30:06,640
i'm getting into the details of the eva

786
00:30:10,230 --> 00:30:08,480
i think it's best to just go ahead and

787
00:30:12,070 --> 00:30:10,240
roll the video so let's go ahead and

788
00:30:14,470 --> 00:30:12,080

start the video

789
00:30:16,710 --> 00:30:14,480
so on uscba 30 with

790
00:30:18,470 --> 00:30:16,720
butch wilmore being ev1 he is going to

791
00:30:19,669 --> 00:30:18,480
be wearing the red stripes on the

792
00:30:21,350 --> 00:30:19,679
spacesuit

793
00:30:22,870 --> 00:30:21,360
and terry verts

794
00:30:25,029 --> 00:30:22,880
being eb2

795
00:30:26,950 --> 00:30:25,039
he is going to be wearing the the white

796
00:30:28,549 --> 00:30:26,960
stripes on his suit

797
00:30:30,470 --> 00:30:28,559
so both crew members are going to

798
00:30:32,389 --> 00:30:30,480
ingress the airlock which is going to be

799
00:30:34,230 --> 00:30:32,399
egressing first

800
00:30:37,190 --> 00:30:34,240
and you see terry who's going to be

801
00:30:38,630 --> 00:30:37,200
translating to the lab forward end cone

802
00:30:41,590 --> 00:30:38,640
very similar translation path to the

803
00:30:43,350 --> 00:30:41,600
first dva and he's at that end cone he's

804
00:30:44,549 --> 00:30:43,360
going to be putting some inhibits in

805
00:30:46,870 --> 00:30:44,559
place

806
00:30:49,510 --> 00:30:46,880
that is required for mating and demating

807
00:30:51,029 --> 00:30:49,520
some cables that's for the ida task so

808
00:30:53,590 --> 00:30:51,039
he does some on the starboard side and

809
00:30:54,310 --> 00:30:53,600
then he goes to the nader side

810
00:30:56,789 --> 00:30:54,320
to

811
00:30:57,669 --> 00:30:56,799
essentially unplug this visiting vehicle

812
00:30:59,509 --> 00:30:57,679
power

813
00:31:00,630 --> 00:30:59,519

so that during the eva we are not making

814
00:31:05,590 --> 00:31:00,640
any hot

815
00:31:09,909 --> 00:31:07,190
meanwhile butch is going to be

816
00:31:11,909 --> 00:31:09,919
translating to node 2 zenith forward end

817
00:31:14,789 --> 00:31:11,919
cone again a very similar translation

818
00:31:17,029 --> 00:31:14,799
path that he had for eba1

819
00:31:18,950 --> 00:31:17,039
and he's going to be going to pma2 the

820
00:31:21,830 --> 00:31:18,960
pressurized main adapter

821
00:31:23,909 --> 00:31:21,840
same same worksite location as eva one

822
00:31:25,590 --> 00:31:23,919
he's going to be setting up that area

823
00:31:26,470 --> 00:31:25,600
setting down a

824
00:31:28,870 --> 00:31:26,480
bag

825
00:31:30,950 --> 00:31:28,880
in which they are going to be removing

826
00:31:32,870 --> 00:31:30,960
the pma2 cover

827
00:31:35,190 --> 00:31:32,880
so this cover acts as a thermal and

828
00:31:36,950 --> 00:31:35,200
micro meteorite protection and we need

829
00:31:39,029 --> 00:31:36,960
to remove it because it's this is where

830
00:31:41,269 --> 00:31:39,039
item one is going to be installed so

831
00:31:43,669 --> 00:31:41,279
both crew members help in that removal

832
00:31:45,590 --> 00:31:43,679
and they pack up that cover and put it

833
00:31:47,110 --> 00:31:45,600
into the bag

834
00:31:50,549 --> 00:31:47,120
once that's complete

835
00:31:52,389 --> 00:31:50,559
the crew is going to finish up the cable

836
00:31:54,710 --> 00:31:52,399
routing that was not completed on the

837
00:31:56,230 --> 00:31:54,720
first tva so terry's going to be working

838
00:31:57,830 --> 00:31:56,240

on the starboard side you see him right

839
00:32:00,789 --> 00:31:57,840
here he is

840
00:32:03,430 --> 00:32:00,799
mating and debating some connectors

841
00:32:05,269 --> 00:32:03,440
this is what those inhibits were needed

842
00:32:07,830 --> 00:32:05,279
so that none of these connections that

843
00:32:09,110 --> 00:32:07,840
he has or will be will be hotmates or or

844
00:32:12,389 --> 00:32:09,120
demates

845
00:32:13,750 --> 00:32:12,399
so butch is going to be on the port side

846
00:32:15,029 --> 00:32:13,760
and he's essentially going to be doing

847
00:32:16,630 --> 00:32:15,039
the same thing

848
00:32:18,070 --> 00:32:16,640
you'll be seeing him

849
00:32:21,509 --> 00:32:18,080
mating and demating some of those

850
00:32:23,269 --> 00:32:21,519
connectors here and once the connectors

851
00:32:25,509 --> 00:32:23,279
have been

852
00:32:28,950 --> 00:32:25,519
connected up they are going to continue

853
00:32:29,909 --> 00:32:28,960
the cable routing of that

854
00:32:31,430 --> 00:32:29,919
as

855
00:32:35,909 --> 00:32:31,440
karina mentioned some of these are for

856
00:32:39,430 --> 00:32:37,990
moving over to back over to terry with

857
00:32:43,110 --> 00:32:39,440
this orange cable

858
00:32:46,070 --> 00:32:43,120
the node 2 forward end cone and that

859
00:32:48,230 --> 00:32:46,080
will be needed for ida 2 connections

860
00:32:50,230 --> 00:32:48,240
moving back over to terry

861
00:32:52,310 --> 00:32:50,240
the cables that are going to be

862
00:32:54,070 --> 00:32:52,320
at the pma2 nader location that's for

863
00:32:55,990 --> 00:32:54,080

item one

864
00:32:57,750 --> 00:32:56,000
and then you can see him routing the

865
00:33:01,430 --> 00:32:57,760
ones that are going to be needed for ida

866
00:33:03,590 --> 00:33:01,440
2 again on that node 2 forward end cone

867
00:33:05,269 --> 00:33:03,600
and that should complete all of the side

868
00:33:07,750 --> 00:33:05,279
of cable rounding that's required for

869
00:33:09,909 --> 00:33:07,760
these evas once that's done

870
00:33:12,630 --> 00:33:09,919
terry's going to head back to the lab

871
00:33:15,029 --> 00:33:12,640
forward end cone and basically plug back

872
00:33:16,389 --> 00:33:15,039
in that is visiting vehicle power so

873
00:33:18,149 --> 00:33:16,399
those inhibits he put in place he's

874
00:33:20,549 --> 00:33:18,159
going to go ahead and mate those back

875
00:33:24,950 --> 00:33:22,710
and both crew members

876
00:33:27,430 --> 00:33:24,960
are going to help with the the cleanup

877
00:33:28,870 --> 00:33:27,440
at the work site of pma

878
00:33:30,789 --> 00:33:28,880
2.

879
00:33:33,110 --> 00:33:30,799
terry is going to go ahead and pick up

880
00:33:34,950 --> 00:33:33,120
that bag that was left out on eva 1 and

881
00:33:37,029 --> 00:33:34,960
bring that back inside in the airlock

882
00:33:39,509 --> 00:33:37,039
and butch is going to grab the bag that

883
00:33:42,230 --> 00:33:39,519
has the pma2 cover in it and bring that

884
00:33:44,310 --> 00:33:42,240
back to the airlock and so they stow

885
00:33:46,230 --> 00:33:44,320
both of those bags inside the airlock

886
00:33:48,950 --> 00:33:46,240
and then they grab the bags that they

887
00:33:50,870 --> 00:33:48,960
will need for the rest of the tasks for

888
00:33:53,669 --> 00:33:50,880

the eva

889
00:33:56,549 --> 00:33:53,679
so terry's task is going to be on esp2

890
00:33:58,870 --> 00:33:56,559
which is the external stowage platform

891
00:34:00,149 --> 00:33:58,880
he is going to be reconfiguring a foot

892
00:34:02,149 --> 00:34:00,159
restraint

893
00:34:04,470 --> 00:34:02,159
and he will then go ahead and ingress

894
00:34:06,950 --> 00:34:04,480
into that foot restraint so he can

895
00:34:08,629 --> 00:34:06,960
complete the lubrication of the space

896
00:34:12,069 --> 00:34:08,639
station remote manipulator system the

897
00:34:13,589 --> 00:34:12,079
ssrms latching end effector the li and

898
00:34:15,030 --> 00:34:13,599
so samantha christopher reddy she's

899
00:34:17,190 --> 00:34:15,040
going to be the robotics operator for

900
00:34:18,710 --> 00:34:17,200
the eva so butch and samantha are going

901
00:34:21,109 --> 00:34:18,720
to be i'm sorry terry and samantha are

902
00:34:23,750 --> 00:34:21,119
going to be talking throughout the eva

903
00:34:25,750 --> 00:34:23,760
making sure that the arm is in a

904
00:34:28,790 --> 00:34:25,760
location where terry can get to the

905
00:34:30,950 --> 00:34:28,800
lubrication that's required

906
00:34:33,510 --> 00:34:30,960
and so we are going to be essentially

907
00:34:35,909 --> 00:34:33,520
lubricating five different portions

908
00:34:38,149 --> 00:34:35,919
of the lee the latching end effector

909
00:34:39,909 --> 00:34:38,159
this picture shows that the face of the

910
00:34:41,270 --> 00:34:39,919
lee and you can see that there are four

911
00:34:44,869 --> 00:34:41,280
latches on it

912
00:34:47,430 --> 00:34:44,879
labeled latch one two three and four

913
00:34:49,270 --> 00:34:47,440

and the next picture shows these latches

914
00:34:51,270 --> 00:34:49,280
in the extended position so while the

915
00:34:52,950 --> 00:34:51,280
latches are extended

916
00:34:55,750 --> 00:34:52,960
we will be able to lubricate the latch

917
00:34:57,670 --> 00:34:55,760
ball screws equalization brackets and

918
00:34:59,349 --> 00:34:57,680
latch deployment rollers

919
00:35:01,430 --> 00:34:59,359
this next picture shows the latches in

920
00:35:06,790 --> 00:35:01,440
the retracted position where we can

921
00:35:09,750 --> 00:35:07,990
another thing that we're going to be

922
00:35:12,230 --> 00:35:09,760
lubricating is the rigidized central

923
00:35:13,750 --> 00:35:12,240
ball screw so in this video you can see

924
00:35:15,910 --> 00:35:13,760
that this ball screw is right in the

925
00:35:19,349 --> 00:35:15,920
middle of the lee and they are going to

926
00:35:20,310 --> 00:35:19,359
be putting grease on a tool

927
00:35:21,990 --> 00:35:20,320
and

928
00:35:24,470 --> 00:35:22,000
getting the feel for what that ball

929
00:35:26,230 --> 00:35:24,480
screw feels like through the gloved hand

930
00:35:28,230 --> 00:35:26,240
and using this tool

931
00:35:30,150 --> 00:35:28,240
and so it's it's a you can see it and

932
00:35:31,910 --> 00:35:30,160
the reason we're doing that first is

933
00:35:34,230 --> 00:35:31,920
because we really want to get terry to

934
00:35:36,950 --> 00:35:34,240
have that feel of

935
00:35:39,190 --> 00:35:36,960
how it feels to lubricate because the

936
00:35:40,870 --> 00:35:39,200
next task is going to be lubricating a

937
00:35:43,030 --> 00:35:40,880
similar ball screw

938
00:35:44,630 --> 00:35:43,040

for the latches and so in this video you

939
00:35:48,069 --> 00:35:44,640
can see they're going to insert this

940
00:35:49,270 --> 00:35:48,079
tool into the cavity

941
00:35:51,190 --> 00:35:49,280
of the latch

942
00:35:52,790 --> 00:35:51,200
and it is all going to be a blind

943
00:35:54,150 --> 00:35:52,800
operation he's not going to actually

944
00:35:55,589 --> 00:35:54,160
physically see

945
00:35:57,190 --> 00:35:55,599
the the ball screw that he is

946
00:35:59,109 --> 00:35:57,200
lubricating and that's why we want him

947
00:36:01,270 --> 00:35:59,119
to make sure he is comfortable so that

948
00:36:06,790 --> 00:36:01,280
he knows he is lubricating the the

949
00:36:10,310 --> 00:36:08,790
so this is showing what it will look

950
00:36:11,670 --> 00:36:10,320
like on the inside

951
00:36:13,990 --> 00:36:11,680
of that latch

952
00:36:14,870 --> 00:36:14,000
and spreading grease all along that ball

953
00:36:16,230 --> 00:36:14,880
screw

954
00:36:17,829 --> 00:36:16,240
again terry's not going to be able to

955
00:36:23,270 --> 00:36:17,839
see that but this is what it will look

956
00:36:26,790 --> 00:36:25,589
once that lubrication is complete we're

957
00:36:28,710 --> 00:36:26,800
going to go ahead and retract the

958
00:36:30,150 --> 00:36:28,720
latches so we can lubricate the linear

959
00:36:32,870 --> 00:36:30,160
track bearings

960
00:36:34,790 --> 00:36:32,880
so each latch has these two track

961
00:36:36,150 --> 00:36:34,800
bearings and we're going to lubricate

962
00:36:37,990 --> 00:36:36,160
both sides

963
00:36:42,150 --> 00:36:38,000

of those tracks

964
00:36:45,109 --> 00:36:43,910
if there's enough time in the eva we're

965
00:36:47,589 --> 00:36:45,119
going to go ahead and continue

966
00:36:48,950 --> 00:36:47,599
lubrication we're going to extend the

967
00:36:51,589 --> 00:36:48,960
latches again

968
00:36:53,829 --> 00:36:51,599
to lubricate the equalization brackets

969
00:36:57,030 --> 00:36:53,839
as well as the deployment rollers so in

970
00:36:58,710 --> 00:36:57,040
this picture again of the extended latch

971
00:37:00,310 --> 00:36:58,720
you can see the equalization brackets so

972
00:37:02,870 --> 00:37:00,320
each latch has

973
00:37:05,430 --> 00:37:02,880
one equalization bracket and then there

974
00:37:07,510 --> 00:37:05,440
are four latch deployment rollers

975
00:37:08,950 --> 00:37:07,520
per latch so

976
00:37:10,870 --> 00:37:08,960
for the latch deployment rollers which

977
00:37:12,550 --> 00:37:10,880
is basically putting a little dab of

978
00:37:14,069 --> 00:37:12,560
grease onto the rollers and the

979
00:37:15,510 --> 00:37:14,079
equalization bracket we put a little

980
00:37:17,270 --> 00:37:15,520
grease along the

981
00:37:23,190 --> 00:37:17,280
inboard and the outboard sides of that

982
00:37:26,630 --> 00:37:25,510
meanwhile butch is going to be doing the

983
00:37:29,349 --> 00:37:26,640
the pmm

984
00:37:31,510 --> 00:37:29,359
prep portion of the eva so the permanent

985
00:37:33,589 --> 00:37:31,520
multi-purpose module

986
00:37:36,790 --> 00:37:33,599
on his way to the worksite he's going to

987
00:37:39,910 --> 00:37:36,800
go up to the z1 port toolbox where he's

988
00:37:40,630 --> 00:37:39,920

going to get a socket that's required

989
00:37:43,030 --> 00:37:40,640
for

990
00:37:45,430 --> 00:37:43,040
the work site out at node 3.

991
00:37:47,670 --> 00:37:45,440
so you can see his translation path how

992
00:37:50,069 --> 00:37:47,680
to node 3. first he's going to go to the

993
00:37:52,710 --> 00:37:50,079
forward side of node 3 and he's going to

994
00:37:54,790 --> 00:37:52,720
be removing a non-propulsive valve an

995
00:37:57,829 --> 00:37:54,800
npv

996
00:38:00,870 --> 00:37:57,839
that when we are relocating the pmm it's

997
00:38:03,349 --> 00:38:00,880
a very tight clearance of

998
00:38:07,190 --> 00:38:03,359
of that relocation so we'd like to

999
00:38:08,950 --> 00:38:07,200
remove this valve during this eva

1000
00:38:13,030 --> 00:38:08,960
and then in its place install a vent

1001
00:38:16,550 --> 00:38:14,630
so that is the valve that we're going to

1002
00:38:18,390 --> 00:38:16,560
remove and that vent cover plate is

1003
00:38:20,150 --> 00:38:18,400
installed we install that cover plate to

1004
00:38:22,870 --> 00:38:20,160
protect the ceiling surfaces of that

1005
00:38:25,670 --> 00:38:22,880
valve because once the pmm is relocated

1006
00:38:26,950 --> 00:38:25,680
here we do have plans to reinstall

1007
00:38:28,630 --> 00:38:26,960
that valve

1008
00:38:30,230 --> 00:38:28,640
once that's complete he moves to the

1009
00:38:32,390 --> 00:38:30,240
starboard side and is going to be

1010
00:38:34,630 --> 00:38:32,400
removing a handrail that has actual

1011
00:38:36,950 --> 00:38:34,640
physical interference when the pmm is

1012
00:38:39,430 --> 00:38:36,960
relocated here

1013
00:38:42,310 --> 00:38:39,440

so we will not be reinstalling it

1014
00:38:44,150 --> 00:38:42,320
next in view is the the cbm the common

1015
00:38:46,470 --> 00:38:44,160
birthing mechanism

1016
00:38:49,349 --> 00:38:46,480
and this is actually where the um the

1017
00:38:51,829 --> 00:38:49,359
pmm is going to be relocated

1018
00:38:53,829 --> 00:38:51,839
and so there are some launch locks that

1019
00:38:55,750 --> 00:38:53,839
need to be released as well as a flap

1020
00:38:58,710 --> 00:38:55,760
that needs to be opened for some camera

1021
00:39:00,870 --> 00:38:58,720
views so on the cbms there are four

1022
00:39:03,030 --> 00:39:00,880
pedals each that has

1023
00:39:04,630 --> 00:39:03,040
two launch locks and so butch is going

1024
00:39:11,750 --> 00:39:04,640
to be releasing all eight of those

1025
00:39:16,390 --> 00:39:13,910
when he is complete with the forward

1026
00:39:18,470 --> 00:39:16,400
side of node three he's going to

1027
00:39:20,870 --> 00:39:18,480
translate over to the app side you can

1028
00:39:21,910 --> 00:39:20,880
see his translation path here so the app

1029
00:39:24,390 --> 00:39:21,920
side

1030
00:39:26,710 --> 00:39:24,400
going to that cbm

1031
00:39:28,630 --> 00:39:26,720
and essentially doing the same thing

1032
00:39:31,109 --> 00:39:28,640
in this location

1033
00:39:33,270 --> 00:39:31,119
is where the beam experiment the bigelow

1034
00:39:34,550 --> 00:39:33,280
expandable activity module is going to

1035
00:39:36,069 --> 00:39:34,560
be

1036
00:39:38,069 --> 00:39:36,079
birth to

1037
00:39:40,069 --> 00:39:38,079
and so again he needs to release the

1038
00:39:42,710 --> 00:39:40,079

launch locks

1039
00:39:45,990 --> 00:39:42,720
of all four pedals and then open up the

1040
00:39:48,550 --> 00:39:46,000
flap that's needed for the camera views

1041
00:39:50,390 --> 00:39:48,560
so once all of the launch locks are

1042
00:39:52,950 --> 00:39:50,400
released and this is for both the

1043
00:39:54,630 --> 00:39:52,960
forward and the aft cbm the ground is

1044
00:39:57,270 --> 00:39:54,640
going to command these pedals open to a

1045
00:39:58,870 --> 00:39:57,280
45 degree position and which is going to

1046
00:40:01,190 --> 00:39:58,880
verify that they did

1047
00:40:02,310 --> 00:40:01,200
deploy in that position and then the

1048
00:40:03,910 --> 00:40:02,320
ground is going to go ahead and close

1049
00:40:05,510 --> 00:40:03,920
them and butch is going to verify that

1050
00:40:07,270 --> 00:40:05,520
they are closed

1051
00:40:09,109 --> 00:40:07,280
once that's complete he's going to head

1052
00:40:11,510 --> 00:40:09,119
back to that tool box

1053
00:40:15,349 --> 00:40:11,520
put his socket away

1054
00:40:18,870 --> 00:40:17,270
and so butch and terry will be back at

1055
00:40:21,589 --> 00:40:18,880
the airlock and that's the

1056
00:40:23,190 --> 00:40:21,599
the planned tasks for the cva we do

1057
00:40:25,750 --> 00:40:23,200
anticipate we'll have some time for the

1058
00:40:28,470 --> 00:40:25,760
get-aheads the first get ahead we would

1059
00:40:30,790 --> 00:40:28,480
be putting wire ties on the s0 truss and

1060
00:40:33,589 --> 00:40:30,800
this is getting a head start for the

1061
00:40:36,630 --> 00:40:33,599
third eva

1062
00:40:39,109 --> 00:40:36,640
another task we can do is to be removing

1063
00:40:41,670 --> 00:40:39,119

a light that's on a camera port that's a

1064
00:40:43,109 --> 00:40:41,680
p1 lower outboard work site so the light

1065
00:40:45,349 --> 00:40:43,119
is dim there so we'll bring the light

1066
00:40:47,910 --> 00:40:45,359
inside and get that fixed

1067
00:40:49,670 --> 00:40:47,920
another task would be reconfiguring the

1068
00:40:51,670 --> 00:40:49,680
seat of cart the seat carts the crew and

1069
00:40:53,190 --> 00:40:51,680
equipment translation aid so we

1070
00:40:55,349 --> 00:40:53,200
basically want to put these in a lower

1071
00:40:57,430 --> 00:40:55,359
profile for the mt the mobile

1072
00:40:59,670 --> 00:40:57,440
transporter so it won't have any

1073
00:41:02,390 --> 00:40:59,680
clearance issues with it so we tie some

1074
00:41:06,710 --> 00:41:02,400
brake handles back

1075
00:41:08,309 --> 00:41:06,720
we go ahead and remove a coupler

1076
00:41:10,309 --> 00:41:08,319
there's the coupler shown there and also

1077
00:41:12,790 --> 00:41:10,319
a swing arm so we remove the coupler and

1078
00:41:14,390 --> 00:41:12,800
the swingarm and we pull those off and

1079
00:41:15,670 --> 00:41:14,400
translate over to

1080
00:41:17,270 --> 00:41:15,680
along the s

1081
00:41:18,470 --> 00:41:17,280
along the truss to

1082
00:41:19,990 --> 00:41:18,480
s0

1083
00:41:22,309 --> 00:41:20,000
where we're going to go ahead and stow

1084
00:41:24,630 --> 00:41:22,319
that out of the way on the wedge face

1085
00:41:28,710 --> 00:41:26,950
this is showing the port cedar cart

1086
00:41:31,750 --> 00:41:28,720
where at this location all we would need

1087
00:41:34,390 --> 00:41:31,760
to do is take a tether to tie down these

1088
00:41:35,990 --> 00:41:34,400

brake handles

1089
00:41:37,030 --> 00:41:36,000
another task we can do is back at the

1090
00:41:39,430 --> 00:41:37,040
airlock

1091
00:41:41,270 --> 00:41:39,440
there is a known sharp edge along the

1092
00:41:44,150 --> 00:41:41,280
handrail of the airlock

1093
00:41:46,390 --> 00:41:44,160
and so we have a handrail clamp that can

1094
00:41:48,470 --> 00:41:46,400
go over that sharp edge you can see it

1095
00:41:50,069 --> 00:41:48,480
here in the picture so we install that

1096
00:41:52,150 --> 00:41:50,079
and so since this is such a highly

1097
00:41:54,470 --> 00:41:52,160
traveled area we install that clamp and

1098
00:41:56,470 --> 00:41:54,480
then the crew doesn't need to worry

1099
00:41:57,990 --> 00:41:56,480
about um cutting their glove or anything

1100
00:41:59,750 --> 00:41:58,000
else on their spacesuit when going over

1101
00:42:02,870 --> 00:41:59,760
that handrail

1102
00:42:06,069 --> 00:42:02,880
and so that is the get aheads that we

1103
00:42:08,710 --> 00:42:06,079
can do for the cva and that uh that's it

1104
00:42:10,230 --> 00:42:08,720
for the video um i also have some tools

1105
00:42:11,430 --> 00:42:10,240
to show you of

1106
00:42:13,750 --> 00:42:11,440
how we're going to be doing some of the

1107
00:42:15,750 --> 00:42:13,760
lubrication

1108
00:42:18,230 --> 00:42:15,760
so this was the the lee was never

1109
00:42:20,950 --> 00:42:18,240
intended to be lubricated in this manner

1110
00:42:23,030 --> 00:42:20,960
so we developed what we call the blt

1111
00:42:25,030 --> 00:42:23,040
this is the the ball screw lubrication

1112
00:42:27,910 --> 00:42:25,040
tool it's made out of a probe and some

1113
00:42:29,190 --> 00:42:27,920

wire ties and lots of tape on it

1114
00:42:31,910 --> 00:42:29,200
and um

1115
00:42:32,950 --> 00:42:31,920
so we have a grease gun

1116
00:42:36,790 --> 00:42:32,960
that we

1117
00:42:40,710 --> 00:42:38,470
inserting the grease on right into this

1118
00:42:42,630 --> 00:42:40,720
uh little cup holder here

1119
00:42:45,589 --> 00:42:42,640
and then inserting this into

1120
00:42:47,829 --> 00:42:45,599
the latches on the lead

1121
00:42:49,750 --> 00:42:47,839
we also have

1122
00:42:52,150 --> 00:42:49,760
several of these eba wipes that we'll

1123
00:42:53,510 --> 00:42:52,160
have at the work site

1124
00:42:57,349 --> 00:42:53,520
just to contain

1125
00:43:01,589 --> 00:42:59,750
and so we've got wipes that you can use

1126
00:43:03,270 --> 00:43:01,599
to to catch any of the grease that's

1127
00:43:05,510 --> 00:43:03,280
needed

1128
00:43:07,990 --> 00:43:05,520
okay

1129
00:43:10,069 --> 00:43:08,000
and those are the details i have for eva

1130
00:43:13,510 --> 00:43:10,079
30 with that i'll pass it on to art

1131
00:43:15,270 --> 00:43:13,520
thomason to talk the details of eva 31

1132
00:43:17,910 --> 00:43:15,280
great thanks a lot sarah

1133
00:43:21,190 --> 00:43:17,920
hello i'm art thomason i am the eva

1134
00:43:22,790 --> 00:43:21,200
officer for us eva 31 during the

1135
00:43:24,470 --> 00:43:22,800
development of the cva i've had the

1136
00:43:26,470 --> 00:43:24,480
privilege of working with an outstanding

1137
00:43:28,950 --> 00:43:26,480
team i'd like to recognize jordan

1138
00:43:30,150 --> 00:43:28,960

lindsey david simon and brian alpert for

1139
00:43:32,309 --> 00:43:30,160
all the great work they've done in

1140
00:43:34,470 --> 00:43:32,319
getting us ready to perform this eba in

1141
00:43:36,309 --> 00:43:34,480
space i'd also like to recognize the

1142
00:43:37,190 --> 00:43:36,319
crew that will be performing this eva on

1143
00:43:39,109 --> 00:43:37,200
orbit

1144
00:43:41,349 --> 00:43:39,119
we have terry verts

1145
00:43:42,390 --> 00:43:41,359
butch wilmore and samantha christa

1146
00:43:44,230 --> 00:43:42,400
ferretti

1147
00:43:46,150 --> 00:43:44,240
terry will be coming out in the suit

1148
00:43:49,190 --> 00:43:46,160
with the red stripes indicating he is

1149
00:43:50,710 --> 00:43:49,200
the lead space walker or ev1

1150
00:43:53,829 --> 00:43:50,720
butch will be wearing the suit with the

1151
00:43:56,230 --> 00:43:53,839
white stripes as ev2 and then samantha

1152
00:43:58,470 --> 00:43:56,240
will be the ivy or intravehicular crew

1153
00:44:00,470 --> 00:43:58,480
member she'll be helping both terry and

1154
00:44:02,550 --> 00:44:00,480
butch get suited up for this spacewalk

1155
00:44:04,470 --> 00:44:02,560
and out the door successfully

1156
00:44:06,550 --> 00:44:04,480
now the purpose of the cva is to install

1157
00:44:10,390 --> 00:44:06,560
the common communications for visiting

1158
00:44:11,589 --> 00:44:10,400
vehicle system or c2v2 as we call it

1159
00:44:14,309 --> 00:44:11,599
excuse me

1160
00:44:16,630 --> 00:44:14,319
c2v2 will aid visiting vehicles and

1161
00:44:18,950 --> 00:44:16,640
rendezvous and docking

1162
00:44:21,910 --> 00:44:18,960
with the international space station now

1163
00:44:23,109 --> 00:44:21,920

this system the c2v2 system consists of

1164
00:44:25,829 --> 00:44:23,119
two booms

1165
00:44:28,309 --> 00:44:25,839
four antennas and three reflectors on

1166
00:44:29,589 --> 00:44:28,319
the cva we'll also be routing 400 feet

1167
00:44:32,470 --> 00:44:29,599
of cable

1168
00:44:33,510 --> 00:44:32,480
this cable consists of four 100 foot

1169
00:44:34,870 --> 00:44:33,520
legs

1170
00:44:37,589 --> 00:44:34,880
that will be routed from the center of

1171
00:44:39,430 --> 00:44:37,599
the space station out to each antenna

1172
00:44:41,349 --> 00:44:39,440
now fortunately butch and terry both had

1173
00:44:42,950 --> 00:44:41,359
an opportunity to see this hardware

1174
00:44:44,710 --> 00:44:42,960
during training in the neutral buoyancy

1175
00:44:45,910 --> 00:44:44,720
lab so they're definitely familiar with

1176
00:44:47,430 --> 00:44:45,920
the hardware

1177
00:44:49,750 --> 00:44:47,440
since they've seen it we've had we've

1178
00:44:51,510 --> 00:44:49,760
tweaked the the plan a little bit to

1179
00:44:53,829 --> 00:44:51,520
increase efficiency

1180
00:44:55,670 --> 00:44:53,839
but we've uplinked procedures briefing

1181
00:44:57,109 --> 00:44:55,680
packages and videos to make sure they

1182
00:44:59,829 --> 00:44:57,119
have all the details they need to

1183
00:45:01,109 --> 00:44:59,839
perform a successful space walk

1184
00:45:02,710 --> 00:45:01,119
with that we can get into more of the

1185
00:45:07,349 --> 00:45:02,720
details and the choreography of the

1186
00:45:12,470 --> 00:45:10,470
so starting out for us eva 31

1187
00:45:14,390 --> 00:45:12,480
terry will come out first he'll be the

1188
00:45:17,190 --> 00:45:14,400

lead space walker

1189
00:45:19,430 --> 00:45:17,200
wearing the suit with the red stripes

1190
00:45:21,750 --> 00:45:19,440
butch will pass out the large oru bag

1191
00:45:24,150 --> 00:45:21,760
with the four cable reels in it

1192
00:45:26,870 --> 00:45:24,160
he'll also pass out the larger of the

1193
00:45:28,790 --> 00:45:26,880
two booms the p3 boom and butch will

1194
00:45:30,950 --> 00:45:28,800
come out with the shorter the two booms

1195
00:45:33,190 --> 00:45:30,960
that will be going on the starboard side

1196
00:45:35,030 --> 00:45:33,200
here you see both booms the boom on the

1197
00:45:37,589 --> 00:45:35,040
bottom is the port boom that terry will

1198
00:45:39,510 --> 00:45:37,599
bring out it has a reflector bag and an

1199
00:45:41,270 --> 00:45:39,520
antenna bag attached to it

1200
00:45:43,190 --> 00:45:41,280
the boom at the top of the page is the

1201
00:45:46,550 --> 00:45:43,200
starboard boom that butch will bring out

1202
00:45:49,030 --> 00:45:46,560
and it has an antenna bag on it

1203
00:45:50,069 --> 00:45:49,040
here you see the antenna bag the hi-fi

1204
00:45:52,069 --> 00:45:50,079
hardware

1205
00:45:54,069 --> 00:45:52,079
we configure the antennas in this way to

1206
00:45:55,430 --> 00:45:54,079
protect the delicate surface on the end

1207
00:45:57,589 --> 00:45:55,440
of the antennas

1208
00:45:59,270 --> 00:45:57,599
here you see an antenna in the upper

1209
00:46:01,510 --> 00:45:59,280
right hand corner that white surface is

1210
00:46:03,109 --> 00:46:01,520
the area that we're trying to protect we

1211
00:46:04,790 --> 00:46:03,119
also have a protective cover that will

1212
00:46:09,030 --> 00:46:04,800
be installed on it now you see that

1213
00:46:13,270 --> 00:46:10,790

at this point both crew members will

1214
00:46:15,670 --> 00:46:13,280
head to their respective work sites

1215
00:46:17,190 --> 00:46:15,680
butch will head har will head starboard

1216
00:46:20,150 --> 00:46:17,200
and here you see terry

1217
00:46:22,470 --> 00:46:20,160
headed port terry will translate over

1218
00:46:25,430 --> 00:46:22,480
the rat's nest we call it that because

1219
00:46:28,150 --> 00:46:25,440
of all the cabling in the area

1220
00:46:31,670 --> 00:46:28,160
so he'll continue out to the p3 or port

1221
00:46:35,990 --> 00:46:33,829
there he'll install his boom into a

1222
00:46:38,150 --> 00:46:36,000
worksite interface or width

1223
00:46:40,550 --> 00:46:38,160
this width is typically used for foot

1224
00:46:42,470 --> 00:46:40,560
restraints for crew members but this

1225
00:46:45,589 --> 00:46:42,480
hardware has been adapted to install

1226
00:46:47,190 --> 00:46:45,599
into this mechanism

1227
00:46:49,589 --> 00:46:47,200
once he gets the boom installed terry

1228
00:46:51,510 --> 00:46:49,599
will remove both bags and stow those on

1229
00:46:57,190 --> 00:46:51,520
structure

1230
00:47:01,589 --> 00:46:59,510
you see that opening up here flashing

1231
00:47:03,190 --> 00:47:01,599
he'll remove both antennas and install

1232
00:47:04,950 --> 00:47:03,200
them on the boom

1233
00:47:06,870 --> 00:47:04,960
from there he'll remove the protective

1234
00:47:08,550 --> 00:47:06,880
cover from the antennas and stow those

1235
00:47:10,470 --> 00:47:08,560
in the crewlock bag

1236
00:47:12,390 --> 00:47:10,480
here you see the antennas in their final

1237
00:47:14,710 --> 00:47:12,400
configuration we have both antennas

1238
00:47:16,550 --> 00:47:14,720

installed now we also have retro

1239
00:47:18,230 --> 00:47:16,560
reflectors installed we're going to wait

1240
00:47:19,430 --> 00:47:18,240
till the end of the eva to get these

1241
00:47:20,710 --> 00:47:19,440
installed

1242
00:47:22,069 --> 00:47:20,720
because they're delicate and we want to

1243
00:47:25,270 --> 00:47:22,079
protect the

1244
00:47:27,109 --> 00:47:25,280
glass on those reflectors

1245
00:47:28,790 --> 00:47:27,119
so meanwhile while terry is working on

1246
00:47:30,470 --> 00:47:28,800
the port side butch will head out to the

1247
00:47:32,630 --> 00:47:30,480
starboard side

1248
00:47:33,750 --> 00:47:32,640
he'll head out to s3 or the starboard 3

1249
00:47:35,349 --> 00:47:33,760
truss

1250
00:47:36,390 --> 00:47:35,359
he'll install the shorter of the two

1251
00:47:40,710 --> 00:47:36,400
booms

1252
00:47:45,349 --> 00:47:43,190
once he gets that installed he'll move

1253
00:47:47,030 --> 00:47:45,359
his crew lock bag with antennas in it

1254
00:47:48,870 --> 00:47:47,040
off to a handrail

1255
00:47:51,510 --> 00:47:48,880
and then he'll open up that bag and

1256
00:47:53,750 --> 00:47:51,520
install both antennas into the boom

1257
00:47:57,270 --> 00:47:53,760
he'll use a pit pin or pull in pull out

1258
00:47:58,950 --> 00:47:57,280
pin to secure these to the boom

1259
00:48:02,470 --> 00:47:58,960
once both are installed he'll remove the

1260
00:48:04,309 --> 00:48:02,480
protective covering from the antennas

1261
00:48:05,750 --> 00:48:04,319
this point he'll close up the bag and

1262
00:48:07,750 --> 00:48:05,760
leave it at the work site because we'll

1263
00:48:09,109 --> 00:48:07,760

use it to bring back in caps later in

1264
00:48:10,549 --> 00:48:09,119
the eva

1265
00:48:15,829 --> 00:48:10,559
so at this point both crew members will

1266
00:48:19,589 --> 00:48:17,510
here you see butch headed back to the

1267
00:48:20,870 --> 00:48:19,599
large oru bag this contains the four

1268
00:48:23,030 --> 00:48:20,880
cable reels

1269
00:48:24,870 --> 00:48:23,040
that will be deployed during the eva

1270
00:48:27,910 --> 00:48:24,880
he's going to move this bag to the u.s

1271
00:48:31,510 --> 00:48:27,920
laboratory to get it in close proximity

1272
00:48:34,950 --> 00:48:31,520
to the debris shield that the c2v z2 v2

1273
00:48:36,470 --> 00:48:34,960
system connects under

1274
00:48:39,430 --> 00:48:36,480
so here you see butch and terry working

1275
00:48:41,190 --> 00:48:39,440
together to remove the debris shield

1276
00:48:44,390 --> 00:48:41,200
they'll demate a connector under that

1277
00:48:47,190 --> 00:48:44,400
shield and make the c2 v2 connector and

1278
00:48:49,829 --> 00:48:47,200
then re-integrate as a j7 connector that

1279
00:48:51,589 --> 00:48:49,839
they demated into the c2v2 cable

1280
00:48:54,470 --> 00:48:51,599
here you see the j7 connector that the

1281
00:48:58,790 --> 00:48:54,480
crew will demate this actually runs to

1282
00:49:02,710 --> 00:49:00,870
here you see the c2v2 connector the

1283
00:49:04,630 --> 00:49:02,720
connector on the left is the one that

1284
00:49:07,349 --> 00:49:04,640
will attach underneath the shield the

1285
00:49:11,430 --> 00:49:07,359
one on the right will reintegrate the

1286
00:49:16,710 --> 00:49:13,109
the crew will then work together to

1287
00:49:18,549 --> 00:49:16,720
reinstall the shield

1288
00:49:20,549 --> 00:49:18,559

at this point butch will head over to

1289
00:49:21,990 --> 00:49:20,559
the larger oru bag and he'll retrieve

1290
00:49:24,630 --> 00:49:22,000
two cable reels

1291
00:49:29,349 --> 00:49:24,640
he'll hand one to terry and he'll keep

1292
00:49:34,549 --> 00:49:31,670
and they'll get ready to route the port

1293
00:49:36,390 --> 00:49:34,559
legs here you see four of the cable bags

1294
00:49:38,230 --> 00:49:36,400
these bags are all tied together by one

1295
00:49:39,990 --> 00:49:38,240
connector that you see at the bottom of

1296
00:49:42,549 --> 00:49:40,000
the pitch here that connects underneath

1297
00:49:44,950 --> 00:49:42,559
the shield here you see the 100 feet of

1298
00:49:47,109 --> 00:49:44,960
cable coiled up inside of one of the

1299
00:49:48,630 --> 00:49:47,119
bags

1300
00:49:50,710 --> 00:49:48,640
as i mentioned both crew members will be

1301
00:49:51,670 --> 00:49:50,720
getting set to head out port for their

1302
00:49:54,069 --> 00:49:51,680
routing

1303
00:49:56,390 --> 00:49:54,079
this graphic shows the two legs at route

1304
00:49:57,750 --> 00:49:56,400
port which they'll take care of first

1305
00:50:00,230 --> 00:49:57,760
once that's complete they'll route the

1306
00:50:06,230 --> 00:50:00,240
two starboard legs

1307
00:50:11,349 --> 00:50:08,069
so terry will head out first he'll

1308
00:50:14,150 --> 00:50:11,359
translate over the rat's nest

1309
00:50:20,710 --> 00:50:14,160
he'll be taking the aft translation path

1310
00:50:25,670 --> 00:50:22,630
and along the way he'll be securing this

1311
00:50:27,270 --> 00:50:25,680
cable with copper wire ties

1312
00:50:29,109 --> 00:50:27,280
and that will secure the cable to

1313
00:50:31,910 --> 00:50:29,119

handrails to make sure that it doesn't

1314
00:50:34,309 --> 00:50:31,920
move and cause any issues

1315
00:50:36,390 --> 00:50:34,319
once he arrives at the boom he'll remove

1316
00:50:37,750 --> 00:50:36,400
two caps from the antennas

1317
00:50:39,750 --> 00:50:37,760
these are to protect the electrical

1318
00:50:43,030 --> 00:50:39,760
connections he'll then remove the

1319
00:50:45,109 --> 00:50:43,040
remaining slack out of his cable bag

1320
00:50:50,150 --> 00:50:45,119
and then he will mate that cable to the

1321
00:50:55,030 --> 00:50:52,150
meanwhile butch will be following terry

1322
00:50:57,990 --> 00:50:55,040
about 20 feet behind you can see his

1323
00:51:00,549 --> 00:50:58,000
cable routing path here as he transl

1324
00:51:02,549 --> 00:51:00,559
translates along the rat's nest he'll be

1325
00:51:03,670 --> 00:51:02,559
actually putting both sets of cables

1326
00:51:05,829 --> 00:51:03,680
into

1327
00:51:07,430 --> 00:51:05,839
one set of wire ties

1328
00:51:09,510 --> 00:51:07,440
until he gets to the point that you see

1329
00:51:12,069 --> 00:51:09,520
here at this point butch will break off

1330
00:51:13,750 --> 00:51:12,079
and start routing his cable on the

1331
00:51:17,109 --> 00:51:13,760
forward path

1332
00:51:18,950 --> 00:51:17,119
along the nader side of the port truss

1333
00:51:22,069 --> 00:51:18,960
this will separate both cables by about

1334
00:51:23,910 --> 00:51:22,079
18 inches and it will protect the system

1335
00:51:26,230 --> 00:51:23,920
from being taken out by a single debris

1336
00:51:28,309 --> 00:51:26,240
strike

1337
00:51:30,069 --> 00:51:28,319
so once butch arrives he'll hand his

1338
00:51:31,670 --> 00:51:30,079

cable off to terry he'll make that to

1339
00:51:33,990 --> 00:51:31,680
the outboard antenna

1340
00:51:36,390 --> 00:51:34,000
completing the connections on the port

1341
00:51:37,990 --> 00:51:36,400
side

1342
00:51:41,030 --> 00:51:38,000
the last thing to do with this work site

1343
00:51:43,270 --> 00:51:41,040
will be to install two retro reflectors

1344
00:51:45,109 --> 00:51:43,280
onto the boom

1345
00:51:46,870 --> 00:51:45,119
terry will take care of that here you

1346
00:51:48,950 --> 00:51:46,880
see the reflectors that will be used

1347
00:51:51,430 --> 00:51:48,960
during this eva it's used for visiting

1348
00:51:52,950 --> 00:51:51,440
vehicle range finding you also see the

1349
00:51:54,390 --> 00:51:52,960
delicate glass surfaces that we're

1350
00:51:56,230 --> 00:51:54,400
trying to protect and that's why we want

1351
00:51:58,630 --> 00:51:56,240
to install these last thing before we

1352
00:51:59,990 --> 00:51:58,640
head out from the work site

1353
00:52:02,630 --> 00:52:00,000
at this point they'll start cleaning up

1354
00:52:04,710 --> 00:52:02,640
this work site

1355
00:52:06,549 --> 00:52:04,720
a butch will take the reflector bag i'm

1356
00:52:08,790 --> 00:52:06,559
sorry terry will take the reflector bag

1357
00:52:11,190 --> 00:52:08,800
and bundle that to his

1358
00:52:12,950 --> 00:52:11,200
empty cable reel bag

1359
00:52:14,549 --> 00:52:12,960
butch will take the antenna bag and

1360
00:52:16,870 --> 00:52:14,559
he'll bundle that with his empty cable

1361
00:52:17,670 --> 00:52:16,880
reel bag both crew members will head

1362
00:52:20,150 --> 00:52:17,680
back

1363
00:52:22,630 --> 00:52:20,160

to the u.s laboratory they'll stow their

1364
00:52:25,270 --> 00:52:22,640
empty reel bags and the empty crew lock

1365
00:52:28,950 --> 00:52:25,280
bag in the large oru bag

1366
00:52:32,870 --> 00:52:28,960
and they'll both pick up a cable reel

1367
00:52:34,710 --> 00:52:32,880
and this time they'll head out starboard

1368
00:52:36,790 --> 00:52:34,720
butch will lead this time and here we

1369
00:52:38,870 --> 00:52:36,800
see butch's translation path he'll take

1370
00:52:41,349 --> 00:52:38,880
the aft path

1371
00:52:45,030 --> 00:52:41,359
out to s3 and terry will be taking the

1372
00:52:49,270 --> 00:52:47,430
once butch arrives at s3

1373
00:52:51,030 --> 00:52:49,280
he'll get ready to remove the two

1374
00:52:52,950 --> 00:52:51,040
protective caps

1375
00:52:57,589 --> 00:52:52,960
from the antenna

1376
00:53:02,230 --> 00:52:59,670
then he'll remove the remaining slack

1377
00:53:04,870 --> 00:53:02,240
out of his bag

1378
00:53:06,630 --> 00:53:04,880
and attach that to the inboard antenna

1379
00:53:07,990 --> 00:53:06,640
at this time terry should be arriving at

1380
00:53:10,790 --> 00:53:08,000
the work site

1381
00:53:12,630 --> 00:53:10,800
he'll drop off the reflector bag

1382
00:53:15,270 --> 00:53:12,640
and leave that for butch he'll then pick

1383
00:53:17,030 --> 00:53:15,280
up the crew lock bag that now has

1384
00:53:18,470 --> 00:53:17,040
caps and protective covers in it and

1385
00:53:22,150 --> 00:53:18,480
he'll bundle that

1386
00:53:23,589 --> 00:53:22,160
with his empty cable reel bag

1387
00:53:25,589 --> 00:53:23,599
terry will then pull out the remaining

1388
00:53:28,549 --> 00:53:25,599

slack of his cable hand that off to

1389
00:53:31,030 --> 00:53:28,559
butch and butch will mate the final

1390
00:53:32,950 --> 00:53:31,040
connection to the c2v2 system the

1391
00:53:37,270 --> 00:53:32,960
outboard connector

1392
00:53:41,109 --> 00:53:38,870
at this point terry will head back

1393
00:53:43,510 --> 00:53:41,119
towards the airlock he'll take his empty

1394
00:53:45,670 --> 00:53:43,520
real bag and crew luck bag he'll stow

1395
00:53:50,870 --> 00:53:45,680
those into the larger u-bag

1396
00:53:54,950 --> 00:53:52,710
meanwhile butch will finish up out on

1397
00:53:57,589 --> 00:53:54,960
the starboard truss he'll install the

1398
00:53:59,829 --> 00:53:57,599
final retro reflector onto the starboard

1399
00:54:03,030 --> 00:53:59,839
boom

1400
00:54:05,030 --> 00:54:03,040
once this is complete he'll take the

1401
00:54:07,510 --> 00:54:05,040
empty reflector bag

1402
00:54:10,309 --> 00:54:07,520
and he'll stow that on his cable reel

1403
00:54:12,870 --> 00:54:10,319
bag and head back to the airlock butch

1404
00:54:15,109 --> 00:54:12,880
will ingress first with those two bags

1405
00:54:16,390 --> 00:54:15,119
then terry will pass in his large oru

1406
00:54:18,870 --> 00:54:16,400
bag

1407
00:54:20,470 --> 00:54:18,880
and then terry will ingress

1408
00:54:25,990 --> 00:54:20,480
and he will close and lock the hatch

1409
00:54:29,829 --> 00:54:28,150
now during the video i did mention that

1410
00:54:31,109 --> 00:54:29,839
we have a cable reel bag showed you some

1411
00:54:32,790 --> 00:54:31,119
pictures of that

1412
00:54:35,349 --> 00:54:32,800
this actually shows a mod this is a

1413
00:54:37,589 --> 00:54:35,359

mock-up of the bag so

1414
00:54:41,030 --> 00:54:37,599
on the ground we packed this bag with a

1415
00:54:46,150 --> 00:54:43,030
if i can get it open here

1416
00:54:47,589 --> 00:54:46,160
so the reel sorry this is the reel here

1417
00:54:49,990 --> 00:54:47,599
the connector that attaches to the

1418
00:54:52,309 --> 00:54:50,000
antenna installs into this slot and then

1419
00:54:54,549 --> 00:54:52,319
we reeled up all 100 feet of cable onto

1420
00:54:56,950 --> 00:54:54,559
this so then when the crew gets it they

1421
00:54:58,870 --> 00:54:56,960
see a bag like this with a small slit of

1422
00:55:00,069 --> 00:54:58,880
the cable coming out so when the crew

1423
00:55:01,990 --> 00:55:00,079
translates

1424
00:55:04,870 --> 00:55:02,000
out to their work site the cable deploys

1425
00:55:07,829 --> 00:55:04,880
automatically as they head out this bag

1426
00:55:10,470 --> 00:55:07,839
also has pockets on each end these

1427
00:55:13,030 --> 00:55:10,480
pockets hold wire tie caddies

1428
00:55:15,430 --> 00:55:13,040
these wire tie caddies hold nine wire

1429
00:55:19,030 --> 00:55:15,440
ties each these wire ties are used to

1430
00:55:21,430 --> 00:55:19,040
secure the cable back to structure

1431
00:55:23,109 --> 00:55:21,440
i think that concludes the us eva 31

1432
00:55:24,950 --> 00:55:23,119
briefing i'll head back to the or hand

1433
00:55:26,870 --> 00:55:24,960
it back to the moderator for questions

1434
00:55:28,390 --> 00:55:26,880
all right thank you again to all of our

1435
00:55:30,150 --> 00:55:28,400
panelists for walking us through that

1436
00:55:32,470 --> 00:55:30,160
again we'll open it up for questions now

1437
00:55:33,829 --> 00:55:32,480
we're going to start here in the room

1438
00:55:35,589 --> 00:55:33,839

and then go to the phone bridge and then

1439
00:55:37,349 --> 00:55:35,599
take a couple off of social media if

1440
00:55:39,270 --> 00:55:37,359
you're on the phone bridge go ahead and

1441
00:55:41,589 --> 00:55:39,280
press star one if you have a question to

1442
00:55:43,589 --> 00:55:41,599
get added into the queue okay i always

1443
00:55:45,109 --> 00:55:43,599
go left to right so let's start with

1444
00:55:47,750 --> 00:55:45,119
eric okay

1445
00:55:49,430 --> 00:55:47,760
i guess question for ken todd

1446
00:55:51,430 --> 00:55:49,440
so when all the work is done including

1447
00:55:52,549 --> 00:55:51,440
these ebays and others i suspect later

1448
00:55:54,710 --> 00:55:52,559
this year

1449
00:55:56,710 --> 00:55:54,720
um sort of describe to me the situation

1450
00:55:58,470 --> 00:55:56,720
with reports how many ports per docking

1451
00:56:00,150 --> 00:55:58,480
will you have and

1452
00:56:01,910 --> 00:56:00,160
are is each of them assigned to a

1453
00:56:03,430 --> 00:56:01,920
specific kind of vehicle and so how many

1454
00:56:04,710 --> 00:56:03,440
we have for

1455
00:56:08,069 --> 00:56:04,720
the russian vehicles how many we have

1456
00:56:10,630 --> 00:56:08,079
for progress and so forth sure

1457
00:56:12,309 --> 00:56:10,640
when you look at the usos our our goal

1458
00:56:13,990 --> 00:56:12,319
by the end of the year

1459
00:56:17,670 --> 00:56:14,000
is to have

1460
00:56:19,510 --> 00:56:17,680
two birthing ports uh for the commercial

1461
00:56:22,230 --> 00:56:19,520
crew vehicles

1462
00:56:24,470 --> 00:56:22,240
and those ports would be node uh

1463
00:56:25,910 --> 00:56:24,480

node two forward where the pma2 is right

1464
00:56:27,910 --> 00:56:25,920
now um

1465
00:56:29,750 --> 00:56:27,920
and we'll have an international docking

1466
00:56:32,870 --> 00:56:29,760
adapter at that location we'll also have

1467
00:56:35,190 --> 00:56:32,880
one on the node 2 zenith location which

1468
00:56:37,670 --> 00:56:35,200
by that time we'll have pma3 pressurized

1469
00:56:39,990 --> 00:56:37,680
mating adapter number three relocated to

1470
00:56:42,470 --> 00:56:40,000
that zenith port and we will also put an

1471
00:56:44,710 --> 00:56:42,480
ida on that one as well so that those

1472
00:56:47,670 --> 00:56:44,720
will be are two ports for the commercial

1473
00:56:49,270 --> 00:56:47,680
crew vehicles and uh either one of the

1474
00:56:50,789 --> 00:56:49,280
the the folks who are currently building

1475
00:56:52,950 --> 00:56:50,799
that hardware can come to either one of

1476
00:56:55,270 --> 00:56:52,960
those ports so so there's no issue with

1477
00:56:57,670 --> 00:56:55,280
with that part of it as far as the the

1478
00:57:00,390 --> 00:56:57,680
cargo vehicles uh we'll have the the

1479
00:57:03,430 --> 00:57:00,400
node 2 nader location that we currently

1480
00:57:05,030 --> 00:57:03,440
use today that's our primary location

1481
00:57:07,030 --> 00:57:05,040
but

1482
00:57:08,950 --> 00:57:07,040
because we're taking the backup

1483
00:57:11,510 --> 00:57:08,960
port that's up on top the node 2 zenith

1484
00:57:14,069 --> 00:57:11,520
and making that a a crude vehicle

1485
00:57:15,589 --> 00:57:14,079
port with an ida and a pma on it now we

1486
00:57:17,990 --> 00:57:15,599
have to create another one so that's

1487
00:57:20,789 --> 00:57:18,000
where we'll we'll put the the node 1

1488
00:57:21,829 --> 00:57:20,799

nader location will become the second

1489
00:57:24,230 --> 00:57:21,839
port

1490
00:57:25,990 --> 00:57:24,240
for for birthing of commercial cargo

1491
00:57:28,150 --> 00:57:26,000
vehicles

1492
00:57:30,150 --> 00:57:28,160
so if you think of a two nader two nader

1493
00:57:32,150 --> 00:57:30,160
ports for the commercial cargo vehicles

1494
00:57:34,470 --> 00:57:32,160
and then you have the the front

1495
00:57:36,470 --> 00:57:34,480
and the and the zenith for the for the

1496
00:57:39,349 --> 00:57:36,480
crew vehicles

1497
00:57:40,950 --> 00:57:39,359
that's right two for cargo two for crew

1498
00:57:43,270 --> 00:57:40,960
and then when you look on the russian

1499
00:57:46,230 --> 00:57:43,280
segment uh their their number of ports

1500
00:57:49,510 --> 00:57:46,240
is has not changed any uh they'll still

1501
00:57:51,829 --> 00:57:49,520
have the uh the fgb location uh which

1502
00:57:54,150 --> 00:57:51,839
they have mrm uh

1503
00:57:54,950 --> 00:57:54,160
one there now

1504
00:57:57,910 --> 00:57:54,960
and

1505
00:58:00,630 --> 00:57:57,920
that's uh they docus soyuz there at this

1506
00:58:03,030 --> 00:58:00,640
point they also have mrm2 where they

1507
00:58:04,309 --> 00:58:03,040
which is up on the zenith side which is

1508
00:58:06,470 --> 00:58:04,319
where they dock

1509
00:58:08,069 --> 00:58:06,480
also and the other soyuz and then they

1510
00:58:10,549 --> 00:58:08,079
in addition to that they they dock

1511
00:58:12,870 --> 00:58:10,559
progress vehicles currently on the aft

1512
00:58:15,589 --> 00:58:12,880
uh which is where they docked yesterday

1513
00:58:17,829 --> 00:58:15,599

um the aft part of the service module

1514
00:58:19,670 --> 00:58:17,839
and then also in the docking compartment

1515
00:58:25,589 --> 00:58:19,680
they dock a progress well there as well

1516
00:58:27,430 --> 00:58:26,630
okay

1517
00:58:29,349 --> 00:58:27,440
gene

1518
00:58:31,349 --> 00:58:29,359
how much is the supply chain been a

1519
00:58:35,670 --> 00:58:31,359
challenge for you when configuring these

1520
00:58:38,710 --> 00:58:36,870
the uh

1521
00:58:40,710 --> 00:58:38,720
i don't know that it's been that much of

1522
00:58:42,710 --> 00:58:40,720
a challenge i mean certainly i think

1523
00:58:44,390 --> 00:58:42,720
we're we're starting to get get up and

1524
00:58:48,630 --> 00:58:44,400
running pretty good with the commercial

1525
00:58:49,990 --> 00:58:48,640
cargo capability and and uh

1526
00:58:51,829 --> 00:58:50,000
you know that's that's going to be key

1527
00:58:53,750 --> 00:58:51,839
to us in terms of being able to do the

1528
00:58:55,349 --> 00:58:53,760
job that we've set out to do this year

1529
00:58:57,190 --> 00:58:55,359
the spacex vehicles have to bring the

1530
00:59:00,789 --> 00:58:57,200
docking adapters for us

1531
00:59:04,069 --> 00:59:00,799
um so so in terms of the logistics part

1532
00:59:05,829 --> 00:59:04,079
of it um it's going to be critical

1533
00:59:07,430 --> 00:59:05,839
but but very much doable i think we'll

1534
00:59:10,549 --> 00:59:07,440
still be able to continue you know

1535
00:59:12,870 --> 00:59:10,559
maintain a healthy science complement

1536
00:59:15,750 --> 00:59:12,880
throughout if we're able to to get all

1537
00:59:17,670 --> 00:59:15,760
the spacex flights we need this year

1538
00:59:19,829 --> 00:59:17,680

as well we'll have an hdv flight out in

1539
00:59:21,190 --> 00:59:19,839
the in the summer early fall time frame

1540
00:59:22,870 --> 00:59:21,200
as well so

1541
00:59:24,470 --> 00:59:22,880
we'll we'll uh i think we'll be okay

1542
00:59:26,549 --> 00:59:24,480
logistics wise and we should still be

1543
00:59:30,549 --> 00:59:26,559
able to uh to finish out the work ahead

1544
00:59:35,510 --> 00:59:32,789
thanks i'm mark caro for aviation

1545
00:59:37,030 --> 00:59:35,520
weakness also for um

1546
00:59:38,549 --> 00:59:37,040
uh kenny todd

1547
00:59:40,549 --> 00:59:38,559
can you um

1548
00:59:43,829 --> 00:59:40,559
can you elaborate a little bit more on

1549
00:59:46,630 --> 00:59:43,839
the on the failure modes of the phantom

1550
00:59:48,789 --> 00:59:46,640
separators did they just not start so

1551
00:59:50,789 --> 00:59:48,799
you can't do a spacewalk or could they

1552
00:59:52,390 --> 00:59:50,799
fail during a spacewalk and what would

1553
00:59:53,510 --> 00:59:52,400
be the consequence

1554
00:59:55,670 --> 00:59:53,520
sure

1555
00:59:57,829 --> 00:59:55,680
relative to

1556
00:59:59,510 --> 00:59:57,839
a condition for going out of the hatches

1557
01:00:01,750 --> 00:59:59,520
is we have to have the fan pep pump

1558
01:00:04,630 --> 01:00:01,760
setups running it needs to be spinning

1559
01:00:06,309 --> 01:00:04,640
in order for us to to go outside

1560
01:00:08,309 --> 01:00:06,319
in this instance for the two suits that

1561
01:00:10,309 --> 01:00:08,319
we're talking about

1562
01:00:12,630 --> 01:00:10,319
we haven't had any issues at this point

1563
01:00:15,910 --> 01:00:12,640

with the fan pump steps and them not not

1564
01:00:18,230 --> 01:00:15,920
spinning up and uh and so we feel very

1565
01:00:20,549 --> 01:00:18,240
good about that at this point one of the

1566
01:00:22,309 --> 01:00:20,559
things that we are working on is to is

1567
01:00:25,109 --> 01:00:22,319
to make sure that we we're comfortable

1568
01:00:27,430 --> 01:00:25,119
that once the crew is outside the hatch

1569
01:00:29,750 --> 01:00:27,440
that there won't be any degradation

1570
01:00:31,750 --> 01:00:29,760
associated with this corrosion

1571
01:00:33,270 --> 01:00:31,760
that could cause the the pump to seize

1572
01:00:36,309 --> 01:00:33,280
once you're outside

1573
01:00:38,470 --> 01:00:36,319
now if you encounter that scenario again

1574
01:00:40,230 --> 01:00:38,480
our our ops guys here will tell you that

1575
01:00:41,589 --> 01:00:40,240
that's something they understand exactly

1576
01:00:44,150 --> 01:00:41,599
what to do

1577
01:00:46,390 --> 01:00:44,160
when they when they hit that scenario

1578
01:00:47,589 --> 01:00:46,400
and all the way up to getting the crew

1579
01:00:48,630 --> 01:00:47,599
back in

1580
01:00:51,750 --> 01:00:48,640
there's a

1581
01:00:52,870 --> 01:00:51,760
totally separate backup system

1582
01:00:55,349 --> 01:00:52,880
in the suit

1583
01:00:56,390 --> 01:00:55,359
that provides plenty of capability for

1584
01:00:58,470 --> 01:00:56,400
the crew to

1585
01:01:02,390 --> 01:00:58,480
to return and ingress the airlock and

1586
01:01:05,030 --> 01:01:02,400
get back on on o2 back in the airlock so

1587
01:01:08,309 --> 01:01:05,040
from that standpoint uh this is

1588
01:01:11,030 --> 01:01:08,319

not a risk to crew if you will in terms

1589
01:01:12,309 --> 01:01:11,040
of loss of life this is you know we want

1590
01:01:14,230 --> 01:01:12,319
to go out of the hatch we want to make

1591
01:01:16,470 --> 01:01:14,240
sure that we've got suits that'll that

1592
01:01:18,630 --> 01:01:16,480
are run for the entirety of the eva but

1593
01:01:21,270 --> 01:01:18,640
if there's anything out there that that

1594
01:01:22,870 --> 01:01:21,280
surprises us once we get out there

1595
01:01:24,789 --> 01:01:22,880
we have a way to deal with it and it's

1596
01:01:26,230 --> 01:01:24,799
it's the same way that that we would

1597
01:01:28,230 --> 01:01:26,240
have dealt with any other failure in

1598
01:01:31,589 --> 01:01:28,240
that particular area uh leading up to

1599
01:01:36,789 --> 01:01:33,670
i think that's the

1600
01:01:38,630 --> 01:01:36,799
30-minute emergency auction but also

1601
01:01:39,829 --> 01:01:38,640
wondered if you could talk about the

1602
01:01:42,150 --> 01:01:39,839
heritage

1603
01:01:45,190 --> 01:01:42,160
of the fan pump separators in the two

1604
01:01:46,150 --> 01:01:45,200
suits that are assigned to wilmore and

1605
01:01:47,510 --> 01:01:46,160
burns

1606
01:01:48,630 --> 01:01:47,520
sure um

1607
01:01:51,349 --> 01:01:48,640
the suit

1608
01:01:54,870 --> 01:01:51,359
that that terry will be in we refer to

1609
01:01:56,549 --> 01:01:54,880
as 05 that particular fan pumps up uh

1610
01:01:59,029 --> 01:01:56,559
was installed

1611
01:02:01,510 --> 01:01:59,039
in december uh that was indeed the first

1612
01:02:04,230 --> 01:02:01,520
suit that that had the the fan pumps up

1613
01:02:07,430 --> 01:02:04,240

that didn't spin up and so so we flew

1614
01:02:11,109 --> 01:02:07,440
another one up and and installed it in

1615
01:02:12,710 --> 01:02:11,119
in the early december time frame and and

1616
01:02:14,710 --> 01:02:12,720
again that one

1617
01:02:16,230 --> 01:02:14,720
has been through several cycles since

1618
01:02:18,069 --> 01:02:16,240
that point

1619
01:02:20,150 --> 01:02:18,079
we're continuing to keep our eye on it

1620
01:02:22,390 --> 01:02:20,160
in terms one of the signatures that you

1621
01:02:24,549 --> 01:02:22,400
see with this corrosion is you see

1622
01:02:27,510 --> 01:02:24,559
a higher current signature

1623
01:02:28,470 --> 01:02:27,520
draw on the motor and uh and

1624
01:02:30,549 --> 01:02:28,480
and

1625
01:02:32,470 --> 01:02:30,559
there's nothing there that that at this

1626
01:02:34,630 --> 01:02:32,480
point that's uh

1627
01:02:37,349 --> 01:02:34,640
leading us to believe that that it's

1628
01:02:38,390 --> 01:02:37,359
going to seize up we are seeing some

1629
01:02:40,789 --> 01:02:38,400
some

1630
01:02:42,150 --> 01:02:40,799
peaks in the data that that lead us to

1631
01:02:45,109 --> 01:02:42,160
believe there is some corrosion in the

1632
01:02:47,910 --> 01:02:45,119
bearings at this point um based on on

1633
01:02:50,789 --> 01:02:47,920
water getting or getting introduced into

1634
01:02:52,630 --> 01:02:50,799
into the back side of the fan there

1635
01:02:54,789 --> 01:02:52,640
but again a large part of what we're

1636
01:02:58,230 --> 01:02:54,799
doing now is trying to assure ourselves

1637
01:02:59,829 --> 01:02:58,240
that that corrosion is uh is limited to

1638
01:03:01,670 --> 01:02:59,839

the point that it won't

1639
01:03:03,109 --> 01:03:01,680
cause the fan to have a problem once it

1640
01:03:05,349 --> 01:03:03,119
goes outside

1641
01:03:07,589 --> 01:03:05,359
and uh and that we can

1642
01:03:08,710 --> 01:03:07,599
we can get through the eba without an

1643
01:03:11,829 --> 01:03:08,720
issue

1644
01:03:13,670 --> 01:03:11,839
so a lot of work going on in that area

1645
01:03:16,549 --> 01:03:13,680
the other suit with o3 that's that's the

1646
01:03:18,390 --> 01:03:16,559
newest suit on orbit right now and uh to

1647
01:03:20,549 --> 01:03:18,400
my knowledge that is the

1648
01:03:22,950 --> 01:03:20,559
the fan pumps up that went up with that

1649
01:03:25,190 --> 01:03:22,960
suit uh so i we haven't we haven't

1650
01:03:26,470 --> 01:03:25,200
changed that one out at this point

1651
01:03:28,829 --> 01:03:26,480
um

1652
01:03:31,829 --> 01:03:28,839
uh i will tell you that that once we

1653
01:03:33,270 --> 01:03:31,839
suspected that we had a problem in this

1654
01:03:35,829 --> 01:03:33,280
area um

1655
01:03:37,589 --> 01:03:35,839
with with water getting behind this fan

1656
01:03:39,670 --> 01:03:37,599
these fans based on the number of times

1657
01:03:42,150 --> 01:03:39,680
that we're cycling the fan pumps and

1658
01:03:45,109 --> 01:03:42,160
putting extra water into that area

1659
01:03:47,270 --> 01:03:45,119
we implemented a a dry out procedure

1660
01:03:50,390 --> 01:03:47,280
that allows us to get a little more

1661
01:03:53,029 --> 01:03:50,400
airflow in that area so uh at least

1662
01:03:53,750 --> 01:03:53,039
these two suits um we've we've been able

1663
01:03:55,510 --> 01:03:53,760

to

1664
01:03:59,349 --> 01:03:55,520
through the last series of flushes that

1665
01:04:01,029 --> 01:03:59,359
we've done implement a

1666
01:04:03,349 --> 01:04:01,039
new strategy for getting a little more

1667
01:04:06,390 --> 01:04:03,359
air into that area and drying them out

1668
01:04:07,670 --> 01:04:06,400
so that so that we can minimize any any

1669
01:04:11,750 --> 01:04:07,680
further

1670
01:04:12,870 --> 01:04:11,760
degradation to the best that we can

1671
01:04:17,029 --> 01:04:12,880
robert

1672
01:04:18,870 --> 01:04:17,039
just to work off mark's question and to

1673
01:04:22,150 --> 01:04:18,880
verify you said the timing would depend

1674
01:04:23,829 --> 01:04:22,160
on your understanding of the van pump um

1675
01:04:26,710 --> 01:04:23,839
so but as of right now you're still

1676
01:04:28,230 --> 01:04:26,720
working towards friday being the first

1677
01:04:30,230 --> 01:04:28,240
spacewalk correct

1678
01:04:31,910 --> 01:04:30,240
at this point i think

1679
01:04:34,230 --> 01:04:31,920
i'm going to i'm going to hedge a little

1680
01:04:37,270 --> 01:04:34,240
bit on that i've got an immt a mission

1681
01:04:39,029 --> 01:04:37,280
management team meeting tomorrow morning

1682
01:04:41,829 --> 01:04:39,039
i think there's enough data still left

1683
01:04:43,589 --> 01:04:41,839
on the table that that

1684
01:04:44,870 --> 01:04:43,599
i'm not i'm not going to throw that out

1685
01:04:46,630 --> 01:04:44,880
here and say we're absolutely going to

1686
01:04:47,990 --> 01:04:46,640
go on friday i don't want to put that

1687
01:04:49,270 --> 01:04:48,000
kind of pressure on the team from a

1688
01:04:50,710 --> 01:04:49,280

schedule standpoint i know there's

1689
01:04:52,309 --> 01:04:50,720
enough

1690
01:04:55,270 --> 01:04:52,319
work being done and

1691
01:04:57,190 --> 01:04:55,280
analysis still to be completed

1692
01:04:58,950 --> 01:04:57,200
i can't i'm not saying we can't do it

1693
01:05:00,470 --> 01:04:58,960
but at this point i don't want to i

1694
01:05:02,390 --> 01:05:00,480
don't think i want to

1695
01:05:03,910 --> 01:05:02,400
want to necessarily stamp approval for

1696
01:05:05,589 --> 01:05:03,920
friday on it just yet i want to wait and

1697
01:05:06,789 --> 01:05:05,599
get through the mission management team

1698
01:05:09,589 --> 01:05:06,799
in the morning and see where the team

1699
01:05:11,430 --> 01:05:09,599
stands and see where the data leads us

1700
01:05:13,190 --> 01:05:11,440
and if you did have to delay that first

1701
01:05:15,029 --> 01:05:13,200
one is it a day for day slip with the

1702
01:05:17,589 --> 01:05:15,039
others as well

1703
01:05:19,670 --> 01:05:17,599
our our thinking at this point uh with

1704
01:05:21,670 --> 01:05:19,680
this being a triple and knowing that

1705
01:05:22,950 --> 01:05:21,680
we're we've got

1706
01:05:24,390 --> 01:05:22,960
you know

1707
01:05:26,390 --> 01:05:24,400
butch coming back here in the middle of

1708
01:05:28,789 --> 01:05:26,400
march we're operating in a window here

1709
01:05:31,190 --> 01:05:28,799
trying to figure out the best way if we

1710
01:05:32,309 --> 01:05:31,200
don't start this this triple set on

1711
01:05:33,910 --> 01:05:32,319
friday

1712
01:05:36,150 --> 01:05:33,920
how to do it in a way that it doesn't

1713
01:05:38,230 --> 01:05:36,160

totally derail some of the other things

1714
01:05:41,190 --> 01:05:38,240
we have going on between now and when

1715
01:05:43,270 --> 01:05:41,200
when butch comes home so

1716
01:05:45,589 --> 01:05:43,280
our thinking right now is to try to stay

1717
01:05:47,750 --> 01:05:45,599
on the on the dates that we have so if

1718
01:05:49,190 --> 01:05:47,760
we don't do the first dva on

1719
01:05:51,190 --> 01:05:49,200
on friday

1720
01:05:52,710 --> 01:05:51,200
chances are based on whatever it is that

1721
01:05:54,309 --> 01:05:52,720
drives us off of friday if it's

1722
01:05:57,109 --> 01:05:54,319
additional data if it's completion of

1723
01:05:58,710 --> 01:05:57,119
testing or whatever we our best guess

1724
01:06:01,029 --> 01:05:58,720
probably is to try to go to tuesday

1725
01:06:02,150 --> 01:06:01,039
which is where our second eva was at

1726
01:06:03,990 --> 01:06:02,160
this point

1727
01:06:06,470 --> 01:06:04,000
and and so that way we can kind of keep

1728
01:06:08,309 --> 01:06:06,480
the spacing and we'll just uh we'll just

1729
01:06:09,349 --> 01:06:08,319
evaluate the third eva and if we have

1730
01:06:11,109 --> 01:06:09,359
time on the

1731
01:06:12,630 --> 01:06:11,119
on the on the back end we'll drop it in

1732
01:06:14,710 --> 01:06:12,640
before we bring butch home if

1733
01:06:17,190 --> 01:06:14,720
everything's continuing to to look good

1734
01:06:18,630 --> 01:06:17,200
on all the different fronts

1735
01:06:20,309 --> 01:06:18,640
okay we'll go ahead and go to the phone

1736
01:06:21,670 --> 01:06:20,319
bridge at this point again if you have a

1737
01:06:23,670 --> 01:06:21,680
question you're on the phone bridge

1738
01:06:25,430 --> 01:06:23,680

press star one you'll get added into the

1739
01:06:29,190 --> 01:06:25,440
queue so why don't we go ahead and start

1740
01:06:33,029 --> 01:06:31,670
hi cat can you tell us if there's a

1741
01:06:34,950 --> 01:06:33,039
deadline by which you have to make a

1742
01:06:37,829 --> 01:06:34,960
decision if the spacewalk will go ahead

1743
01:06:41,910 --> 01:06:39,670
well i think i think i've got all the

1744
01:06:43,910 --> 01:06:41,920
way up till till

1745
01:06:45,589 --> 01:06:43,920
tomorrow

1746
01:06:47,750 --> 01:06:45,599
probably about middle of the day we need

1747
01:06:50,470 --> 01:06:47,760
to get the word on board to the crew our

1748
01:06:53,190 --> 01:06:50,480
ops team needs to start getting into the

1749
01:06:54,870 --> 01:06:53,200
the final preps which means

1750
01:06:56,950 --> 01:06:54,880
the team that's going to execute the eva

1751
01:06:58,309 --> 01:06:56,960
needs to know that so that they can get

1752
01:07:01,109 --> 01:06:58,319
the proper

1753
01:07:03,109 --> 01:07:01,119
personnel rested and and ready to go so

1754
01:07:04,870 --> 01:07:03,119
i think we've got a little bit of runway

1755
01:07:06,309 --> 01:07:04,880
um but uh

1756
01:07:08,309 --> 01:07:06,319
again i i

1757
01:07:10,470 --> 01:07:08,319
we can't run it too late into the day

1758
01:07:12,710 --> 01:07:10,480
tomorrow uh just uh just because of the

1759
01:07:14,230 --> 01:07:12,720
crew day and and making sure that uh

1760
01:07:17,910 --> 01:07:14,240
that they're fully aware of what we're

1761
01:07:21,190 --> 01:07:19,430
okay that's all we have on the phone

1762
01:07:23,190 --> 01:07:21,200
bridge for right now let's take a couple

1763
01:07:25,109 --> 01:07:23,200

of social media questions we've been

1764
01:07:27,029 --> 01:07:25,119
soliciting some from our followers i

1765
01:07:28,470 --> 01:07:27,039
think we have time for one or two yeah i

1766
01:07:30,230 --> 01:07:28,480
think we're getting a lot of questions

1767
01:07:32,309 --> 01:07:30,240
on uh social media but we only have time

1768
01:07:34,069 --> 01:07:32,319
for a couple so this one comes from

1769
01:07:35,910 --> 01:07:34,079
margaret on twitter she wants to know

1770
01:07:40,230 --> 01:07:35,920
what will be the most challenging aspect

1771
01:07:40,240 --> 01:07:45,990
or the first one the first one

1772
01:07:50,549 --> 01:07:48,150
most challenging uh

1773
01:07:52,230 --> 01:07:50,559
probably just the the overall

1774
01:07:53,109 --> 01:07:52,240
length of the the number of cables that

1775
01:07:55,029 --> 01:07:53,119
they

1776
01:07:56,870 --> 01:07:55,039
need to route and and keeping that

1777
01:07:58,710 --> 01:07:56,880
straight it's there's nothing that's

1778
01:08:01,109 --> 01:07:58,720
very

1779
01:08:03,510 --> 01:08:01,119
especially difficult about this eva but

1780
01:08:05,029 --> 01:08:03,520
it is a lot of a lot of cables and wire

1781
01:08:10,710 --> 01:08:05,039
ties to manipulate and things so some

1782
01:08:13,829 --> 01:08:11,910
i understand the astronauts will be

1783
01:08:16,709 --> 01:08:13,839
routing cable outside the station what

1784
01:08:20,870 --> 01:08:16,719
activities did they do on iss to prepare

1785
01:08:24,789 --> 01:08:22,709
i know butch told me that he was he was

1786
01:08:26,630 --> 01:08:24,799
doing the hand exercises that they they

1787
01:08:28,229 --> 01:08:26,640
do so

1788
01:08:30,309 --> 01:08:28,239

making sure their hands are in good

1789
01:08:32,149 --> 01:08:30,319
shape for that as well as of course all

1790
01:08:33,990 --> 01:08:32,159
of our normal eva preparations that they

1791
01:08:35,269 --> 01:08:34,000
do studying the timelines and getting

1792
01:08:37,269 --> 01:08:35,279
their suits ready

1793
01:08:38,950 --> 01:08:37,279
so

1794
01:08:40,870 --> 01:08:38,960
okay let's take a couple of quick

1795
01:08:41,749 --> 01:08:40,880
follow-ups here in the room

1796
01:08:45,349 --> 01:08:41,759
mark

1797
01:08:47,910 --> 01:08:45,359
arthur thomas and

1798
01:08:49,990 --> 01:08:47,920
i'm sorry i think i made some notes on

1799
01:08:51,669 --> 01:08:50,000
the kinds of communications that will be

1800
01:08:53,590 --> 01:08:51,679
covered with these two different

1801
01:08:55,510 --> 01:08:53,600
antennas but could you go over the range

1802
01:08:57,510 --> 01:08:55,520
is there some navigation and guidance in

1803
01:08:59,189 --> 01:08:57,520
there is it voice that kind of thing

1804
01:09:01,430 --> 01:08:59,199
trying to doing docking

1805
01:09:03,669 --> 01:09:01,440
for visiting vehicles yeah

1806
01:09:05,590 --> 01:09:03,679
it's so it's just telemetry i get a 16.

1807
01:09:07,110 --> 01:09:05,600
that's right and there's also reflectors

1808
01:09:08,789 --> 01:09:07,120
that are installed and so lasers are

1809
01:09:13,510 --> 01:09:08,799
shined on those reflectors for range

1810
01:09:16,630 --> 01:09:14,870
okay eric

1811
01:09:18,550 --> 01:09:16,640
uh yeah just a quick follow-up how many

1812
01:09:20,229 --> 01:09:18,560
runs in the nbl did these guys do in

1813
01:09:23,430 --> 01:09:20,239

preparation for each of these space

1814
01:09:25,430 --> 01:09:23,440
walks would they do like you know eva 29

1815
01:09:27,590 --> 01:09:25,440
six times in the pool and then do eba 30

1816
01:09:31,189 --> 01:09:27,600
or did they kind of combine the tasks

1817
01:09:35,269 --> 01:09:32,630
yeah we uh

1818
01:09:37,349 --> 01:09:35,279
butch and butch and terry saw the first

1819
01:09:38,789 --> 01:09:37,359
eva they each saw it once with a

1820
01:09:42,390 --> 01:09:38,799
different crew member and they saw it

1821
01:09:43,990 --> 01:09:42,400
once together um you know in in the post

1822
01:09:46,630 --> 01:09:44,000
shuttle era we don't get to practice

1823
01:09:48,470 --> 01:09:46,640
every eva multiple times like we used to

1824
01:09:50,789 --> 01:09:48,480
and so we have changed our

1825
01:09:52,950 --> 01:09:50,799
our training so that it's a

1826
01:09:55,110 --> 01:09:52,960
skills-based kind of thing so they get i

1827
01:09:56,790 --> 01:09:55,120
think it's 10 nbl runs through their

1828
01:09:58,470 --> 01:09:56,800
entire training that

1829
01:10:00,070 --> 01:09:58,480
that covers all of the contingency

1830
01:10:01,910 --> 01:10:00,080
things they could need to repair on the

1831
01:10:05,110 --> 01:10:01,920
space station as well as skills they

1832
01:10:06,390 --> 01:10:05,120
might need to do on planned dvas

1833
01:10:09,669 --> 01:10:06,400
and as far as

1834
01:10:11,590 --> 01:10:09,679
pva 30 goes the crew did run some runs

1835
01:10:13,669 --> 01:10:11,600
the first half of the eda with removing

1836
01:10:16,070 --> 01:10:13,679
the pma2 cover and then

1837
01:10:18,470 --> 01:10:16,080
the finishing the cable routing as far

1838
01:10:20,790 --> 01:10:18,480

as the the lead lubrication we had some

1839
01:10:23,910 --> 01:10:20,800
work just in a 1g environment because

1840
01:10:25,669 --> 01:10:23,920
the the hardware at the mbl wasn't

1841
01:10:27,270 --> 01:10:25,679
mocked up to the highest fidelity that

1842
01:10:28,950 --> 01:10:27,280
we need to do

1843
01:10:31,910 --> 01:10:28,960
to to actually get the lubrication in

1844
01:10:33,910 --> 01:10:31,920
all the spots so terry did do a run

1845
01:10:37,189 --> 01:10:33,920
in the mbl with a lead that was

1846
01:10:39,110 --> 01:10:37,199
basically an empty cavity of the latches

1847
01:10:41,030 --> 01:10:39,120
so they they have some

1848
01:10:43,110 --> 01:10:41,040
great training videos on board and

1849
01:10:46,550 --> 01:10:43,120
they're practicing using you know the

1850
01:10:49,110 --> 01:10:46,560
blt to get to the lubrication spots um

1851
01:10:51,030 --> 01:10:49,120
and then the rest of the eva with butch

1852
01:10:53,830 --> 01:10:51,040
on node three it's it's rather you know

1853
01:10:55,830 --> 01:10:53,840
that standard standard ops of removing

1854
01:11:06,310 --> 01:10:55,840
hardware and you know bolts and and

1855
01:11:09,270 --> 01:11:07,750
um

1856
01:11:14,390 --> 01:11:09,280
they're

1857
01:11:15,910 --> 01:11:14,400
to do it but you know we don't

1858
01:11:18,149 --> 01:11:15,920
anticipate anything

1859
01:11:20,390 --> 01:11:18,159
surprising during these evas since they

1860
01:11:23,510 --> 01:11:20,400
even though they didn't do a full end

1861
01:11:26,630 --> 01:11:23,520
run to run of these spacewalks

1862
01:11:28,550 --> 01:11:26,640
okay one more real quick robert uh rob

1863
01:11:30,229 --> 01:11:28,560

perlman with collect space um just

1864
01:11:33,430 --> 01:11:30,239
stepping back for a moment this

1865
01:11:35,669 --> 01:11:33,440
if these do get off this week or next

1866
01:11:38,310 --> 01:11:35,679
they're coming about a month before

1867
01:11:40,870 --> 01:11:38,320
the 50th anniversary of eba

1868
01:11:43,030 --> 01:11:40,880
can anyone who wants to take it uh

1869
01:11:45,669 --> 01:11:43,040
talk about what um the complexity of

1870
01:11:51,030 --> 01:11:45,679
this eba sort of says about how far

1871
01:11:51,040 --> 01:11:53,750
yeah

1872
01:11:57,750 --> 01:11:55,110
i mean from

1873
01:11:59,510 --> 01:11:57,760
from eva 30 standpoint lubricating the

1874
01:12:01,910 --> 01:11:59,520
the lee you know was never intended to

1875
01:12:03,590 --> 01:12:01,920
be lubricated that way um

1876
01:12:04,950 --> 01:12:03,600
it's been on over it for a while and

1877
01:12:06,070 --> 01:12:04,960
they

1878
01:12:08,070 --> 01:12:06,080
think it needs some of this wet

1879
01:12:10,470 --> 01:12:08,080
lubrication just so just for the fact

1880
01:12:12,630 --> 01:12:10,480
that you develop a tool that's on board

1881
01:12:15,110 --> 01:12:12,640
you know you develop a tool out of items

1882
01:12:17,110 --> 01:12:15,120
that are on board to lubricate what you

1883
01:12:18,630 --> 01:12:17,120
actually need to fix it because we can't

1884
01:12:20,550 --> 01:12:18,640
bring it home to fix it

1885
01:12:23,910 --> 01:12:20,560
i think that does say a lot of how far

1886
01:12:25,990 --> 01:12:23,920
we've come of adapting to hardware being

1887
01:12:27,830 --> 01:12:26,000
up in space for a long time and fixing

1888
01:12:29,910 --> 01:12:27,840

things with what you have on orbit to

1889
01:12:31,910 --> 01:12:29,920
get the job done

1890
01:12:33,590 --> 01:12:31,920
i think kind of to build on on what

1891
01:12:35,590 --> 01:12:33,600
karina says we've we've changed things

1892
01:12:37,510 --> 01:12:35,600
since the shuttle era too where we would

1893
01:12:40,390 --> 01:12:37,520
do maybe 10 runs in the water they would

1894
01:12:41,910 --> 01:12:40,400
get this eva choreographed the crew knew

1895
01:12:44,470 --> 01:12:41,920
every single detail

1896
01:12:45,910 --> 01:12:44,480
where now we plant it on the ground get

1897
01:12:48,709 --> 01:12:45,920
it ironed out on the ground and we send

1898
01:12:50,630 --> 01:12:48,719
them our briefing packages videos

1899
01:12:53,110 --> 01:12:50,640
the graphic like you saw that we showed

1900
01:12:55,350 --> 01:12:53,120
here all that stuff helps the crew study

1901
01:12:58,149 --> 01:12:55,360
on board and minimizes the training they

1902
01:13:01,430 --> 01:12:59,430
okay well that's going to go ahead and

1903
01:13:04,550 --> 01:13:01,440
wrap it up for us today thanks again for

1904
01:13:06,470 --> 01:13:04,560
joining us for this eva preview briefing

1905
01:13:08,229 --> 01:13:06,480
and as always you can go onto our

1906
01:13:09,669 --> 01:13:08,239
website get all the latest times

1907
01:13:11,750 --> 01:13:09,679
coverage times

1908
01:13:13,590 --> 01:13:11,760
and the latest information on these evas

1909
01:13:16,870 --> 01:13:13,600
as they get ready to unfold at