1
00:00:03,750 --> 00:00:02,149
good afternoon and welcome back to

2
00:00:06,230 --> 00:00:03,760
nasa's johnson space center as we

3
00:00:07,749 --> 00:00:06,240
continue to take a look at the sts-134

4
00:00:09,589 --> 00:00:07,759
mission and endeavors flight to the

5
00:00:11,350 --> 00:00:09,599
international space station there's

6
00:00:12,789 --> 00:00:11,360
going to be four space walks planned for

7
00:00:15,110 --> 00:00:12,799
this mission these will also be the

8
00:00:16,630 --> 00:00:15,120
final spacewalks ever conducted by a

9
00:00:18,470 --> 00:00:16,640
space shuttle crew so here to give us

10
00:00:20,310 --> 00:00:18,480
more details about all of that is

11
00:00:23,349 --> 00:00:20,320
allison bolinger she is the lead

12
00:00:25,509 --> 00:00:23,359
spacewalk officer for sts-134 go ahead

13
00:00:27,509 --> 00:00:25,519

thanks josh i'm very excited to be here

14
00:00:29,750 --> 00:00:27,519
today to talk about the spacewalks that

15
00:00:31,750 --> 00:00:29,760
we will be performing on the sts-134

16
00:00:33,830 --> 00:00:31,760
mission as josh mentioned we have four

17
00:00:36,069 --> 00:00:33,840
spacewalks planned on this mission they

18
00:00:38,229 --> 00:00:36,079
will occur on flight days five seven

19
00:00:39,910 --> 00:00:38,239
nine and eleven we will be utilizing

20
00:00:41,910 --> 00:00:39,920
three of endeavour's crew members to

21
00:00:43,510 --> 00:00:41,920
perform these spacewalks and each of

22
00:00:46,069 --> 00:00:43,520
these crew members brings a very unique

23
00:00:49,029 --> 00:00:46,079
experience space to our team

24
00:00:50,549 --> 00:00:49,039
our lead spacewalker ev1 is drew feustel

25
00:00:52,549 --> 00:00:50,559
drew will be wearing the suit that's

26
00:00:54,389 --> 00:00:52,559
marked with a solid red stripe drew

27
00:00:56,430 --> 00:00:54,399
comes to us with three space walks under

28
00:00:58,790 --> 00:00:56,440
his belt which he performed during the

29
00:01:00,470 --> 00:00:58,800
sts-125 mission which was the most

30
00:01:02,470 --> 00:01:00,480
recent hubble telescope servicing

31
00:01:04,229 --> 00:01:02,480
mission so this will be drew's first

32
00:01:06,230 --> 00:01:04,239
trip to the international space station

33
00:01:08,870 --> 00:01:06,240
and he will be performing spacewalks one

34
00:01:10,630 --> 00:01:08,880
two and three no stranger to spacewalk

35
00:01:13,030 --> 00:01:10,640
however i'm sorry no stranger to the

36
00:01:15,190 --> 00:01:13,040
international space station is our ev2

37
00:01:17,190 --> 00:01:15,200
crew member who will be mike fink mike

38
00:01:19,590 --> 00:01:17,200

has spent just a little over a year on

39
00:01:21,749 --> 00:01:19,600
the space station during expeditions 9

40
00:01:23,990 --> 00:01:21,759
and 18. during that time on the space

41
00:01:25,830 --> 00:01:24,000
station mike performed six space walks

42
00:01:28,070 --> 00:01:25,840
however all of those space walks were in

43
00:01:31,749 --> 00:01:28,080
the russian orlan suit so these will be

44
00:01:33,510 --> 00:01:31,759
his first spacewalks in the u.s emu he

45
00:01:36,069 --> 00:01:33,520
will be wearing the all-white suit on

46
00:01:38,390 --> 00:01:36,079
eva's 2 3 and 4.

47
00:01:40,390 --> 00:01:38,400
our ev3 crew member will be greg

48
00:01:42,469 --> 00:01:40,400
chamotov greg will be wearing the suit

49
00:01:44,310 --> 00:01:42,479
marked with the broken red stripes greg

50
00:01:46,630 --> 00:01:44,320
is also no stranger to space station he

51
00:01:47,590 --> 00:01:46,640
spent a little over six months up there

52
00:01:50,389 --> 00:01:47,600
during the

53
00:01:52,310 --> 00:01:50,399
expanding expedition 17 and 18. these

54
00:01:55,109 --> 00:01:52,320
will be his first spacewalks and he will

55
00:01:57,429 --> 00:01:55,119
be performing evas 1 and 4.

56
00:01:58,709 --> 00:01:57,439
the role of the task iv crew member or

57
00:02:00,709 --> 00:01:58,719
the person who remains inside the

58
00:02:02,550 --> 00:02:00,719
shuttle to choreograph the space walks

59
00:02:04,950 --> 00:02:02,560
will be performed by as i call it the

60
00:02:06,550 --> 00:02:04,960
odd man in or one of the three eva crew

61
00:02:08,869 --> 00:02:06,560
members who is not outside performing

62
00:02:10,630 --> 00:02:08,879
the space walk that day

63
00:02:13,270 --> 00:02:10,640

endeavors commander mark kelly will

64
00:02:15,510 --> 00:02:13,280
serve as our suit iv or the crew member

65
00:02:17,110 --> 00:02:15,520
in charge of getting the eva crew ready

66
00:02:18,790 --> 00:02:17,120
to go out the door which includes

67
00:02:21,350 --> 00:02:18,800
depressing and repressing the iss

68
00:02:23,350 --> 00:02:21,360
airlock he will be assisted by iss crew

69
00:02:24,790 --> 00:02:23,360
members paolo nespoli and ron garan to

70
00:02:27,030 --> 00:02:24,800
help with his duties

71
00:02:29,350 --> 00:02:27,040
wrapping up our eva team is endeavour's

72
00:02:31,350 --> 00:02:29,360
pilot greg box johnson i'll refer to him

73
00:02:33,509 --> 00:02:31,360
as greg i'm sorry as box so as not to

74
00:02:35,430 --> 00:02:33,519
confuse him with greg chamitov

75
00:02:40,790 --> 00:02:35,440
greg will be flying box will be flying

76
00:02:42,949 --> 00:02:40,800
the robotic arm for us on evas 2 and 4.

77
00:02:44,710 --> 00:02:42,959
another unique aspect to our mission

78
00:02:46,229 --> 00:02:44,720
will be the first time use of a new

79
00:02:48,390 --> 00:02:46,239
pre-breathe protocol which i believe you

80
00:02:50,470 --> 00:02:48,400
heard about earlier in derek's briefing

81
00:02:52,470 --> 00:02:50,480
this new protocol the protocols are

82
00:02:54,309 --> 00:02:52,480
generally used to purge the eva crew

83
00:02:56,229 --> 00:02:54,319
member's body of nitrogen prior to

84
00:02:58,070 --> 00:02:56,239
egressing to perform an eva to avoid

85
00:03:00,550 --> 00:02:58,080
getting decompression sickness or the

86
00:03:02,710 --> 00:03:00,560
bends on currently our pre-flight plan

87
00:03:05,350 --> 00:03:02,720
on evas 1 2 and 4

88
00:03:07,350 --> 00:03:05,360

is to utilize the nominal eva kampa

89
00:03:09,350 --> 00:03:07,360
pre-booth protocol which is the protocol

90
00:03:13,270 --> 00:03:09,360
in which the crew members are isolated

91
00:03:15,990 --> 00:03:13,280
in the iss airlock at 10.2 psi overnight

92
00:03:18,550 --> 00:03:16,000
for eva 3 however we will be we will be

93
00:03:21,110 --> 00:03:18,560
utilizing this new aisle or in-suit

94
00:03:23,270 --> 00:03:21,120
light exercise pre-breathe protocol this

95
00:03:25,910 --> 00:03:23,280
protocol starts the morning of the eva

96
00:03:27,830 --> 00:03:25,920
and looks very similar to the morning of

97
00:03:29,270 --> 00:03:27,840
camp out day of eva with a slight

98
00:03:30,869 --> 00:03:29,280
exception that i'll talk about and show

99
00:03:32,869 --> 00:03:30,879
you a video of

100
00:03:35,270 --> 00:03:32,879
the crew members will begin the day by

101
00:03:38,309 --> 00:03:35,280
donning oxygen masks we will depress the

102
00:03:40,070 --> 00:03:38,319
airlock down to 10.2 psi this will be

103
00:03:41,750 --> 00:03:40,080
with the two eevee crew members and the

104
00:03:44,550 --> 00:03:41,760
three ivy crew members who will assist

105
00:03:45,990 --> 00:03:44,560
in donning it's at this time at 10.2 psi

106
00:03:47,990 --> 00:03:46,000
that the crew members will don their

107
00:03:51,270 --> 00:03:48,000
suits then we will repress the airlock

108
00:03:53,350 --> 00:03:51,280
back up to 14.7 psi they will perform

109
00:03:54,630 --> 00:03:53,360
the nominal 50 minute in-suit resting

110
00:03:56,789 --> 00:03:54,640
pre-breathe which you've seen with the

111
00:03:58,710 --> 00:03:56,799
camp protocol and then for this new

112
00:04:01,350 --> 00:03:58,720
aisle protocol we will add an additional

113
00:04:05,830 --> 00:04:01,360

50 minutes of light in suit exercise so

114
00:04:09,670 --> 00:04:08,070
alright so this is video that was taken

115
00:04:11,670 --> 00:04:09,680
during one of our training runs at the

116
00:04:13,509 --> 00:04:11,680
neutral buoyancy lab

117
00:04:15,190 --> 00:04:13,519
on the left side we've got

118
00:04:16,789 --> 00:04:15,200
crew member mike fink on the right side

119
00:04:19,270 --> 00:04:16,799
we have drew feustel and you can see

120
00:04:21,270 --> 00:04:19,280
they're performing the light exercise

121
00:04:23,270 --> 00:04:21,280
as we as just as you could see it's

122
00:04:25,670 --> 00:04:23,280
extremely light exercise something that

123
00:04:28,230 --> 00:04:25,680
i fondly refer to as a slow motion hokey

124
00:04:29,990 --> 00:04:28,240
pokey so during the 50 minutes of this

125
00:04:31,510 --> 00:04:30,000
exercise the crew members will be doing

126
00:04:33,430 --> 00:04:31,520
these slight flutter kicks with their

127
00:04:35,110 --> 00:04:33,440
legs for four minutes they will rest for

128
00:04:36,790 --> 00:04:35,120
a minute they will exercise again for

129
00:04:39,430 --> 00:04:36,800
four minutes they will rest for another

130
00:04:41,830 --> 00:04:39,440
minute and we will continue this for the

131
00:04:43,590 --> 00:04:41,840
next 50 minutes as derek mentioned there

132
00:04:44,790 --> 00:04:43,600
are quite a few benefits to this new

133
00:04:46,150 --> 00:04:44,800
protocol

134
00:04:47,510 --> 00:04:46,160
the first one is that the crew members

135
00:04:49,189 --> 00:04:47,520
are not isolated in the airlock

136
00:04:51,270 --> 00:04:49,199
overnight so they can have a normal

137
00:04:53,110 --> 00:04:51,280
night before eva and a normal morning of

138
00:04:55,030 --> 00:04:53,120

eva when they first wake up the crew

139
00:04:56,629 --> 00:04:55,040
members spend less time on the oxygen

140
00:04:59,270 --> 00:04:56,639
masks which can be uncomfortable for

141
00:05:01,350 --> 00:04:59,280
some crew members and we are also

142
00:05:04,070 --> 00:05:01,360
expecting this protocol to use less of

143
00:05:05,670 --> 00:05:04,080
station's precious resource of oxygen so

144
00:05:07,590 --> 00:05:05,680
there's been quite a bit of planning on

145
00:05:09,110 --> 00:05:07,600
the ground that has gone into preparing

146
00:05:11,350 --> 00:05:09,120
this protocol for flight so i'm very

147
00:05:14,070 --> 00:05:11,360
excited to see it in action on eva 3 and

148
00:05:15,430 --> 00:05:14,080
possibly eva4

149
00:05:16,629 --> 00:05:15,440
with that i'll go ahead and start

150
00:05:17,909 --> 00:05:16,639
detailing

151
00:05:20,469 --> 00:05:17,919
the different tasks that we'll be

152
00:05:22,950 --> 00:05:20,479
performing on the evas we will start out

153
00:05:25,029 --> 00:05:22,960
eva 1 with our highest eva mission

154
00:05:26,629 --> 00:05:25,039
priority which is to retrieve two

155
00:05:28,390 --> 00:05:26,639
experiments that are currently located

156
00:05:29,510 --> 00:05:28,400
on the s3 truss

157
00:05:32,310 --> 00:05:29,520
these experiments are called the

158
00:05:35,270 --> 00:05:32,320
materials iss experiments or missy 7a

159
00:05:37,590 --> 00:05:35,280
and 7b these experiments were installed

160
00:05:40,710 --> 00:05:37,600
during the sts-129 mission on the

161
00:05:42,629 --> 00:05:40,720
express logistics carrier or elc 2. we

162
00:05:43,990 --> 00:05:42,639
will retrieve these experiments and then

163
00:05:45,830 --> 00:05:44,000

take them to the payload bay for the

164
00:05:47,430 --> 00:05:45,840
return home while we're in the payload

165
00:05:49,590 --> 00:05:47,440
bay we'll retrieve a new missy 8

166
00:05:52,390 --> 00:05:49,600
experiment which drew will install in

167
00:05:53,990 --> 00:05:52,400
the spot where missy 7a was located

168
00:05:56,629 --> 00:05:54,000
the middle part of this eva will be

169
00:05:58,710 --> 00:05:56,639
dedicated to setting up for eva2's

170
00:06:00,950 --> 00:05:58,720
ammonia refill of the cooling system out

171
00:06:03,110 --> 00:06:00,960
on the p6 truss this is the cooling

172
00:06:04,469 --> 00:06:03,120
system that cools the batteries for the

173
00:06:07,670 --> 00:06:04,479
solar arrays out there it's also

174
00:06:10,230 --> 00:06:07,680
referred to as the pvtcs or photovoltaic

175
00:06:11,909 --> 00:06:10,240
photovoltaic thermal control system this

176
00:06:13,510 --> 00:06:11,919
system has been experienced a slight

177
00:06:15,350 --> 00:06:13,520
leak over the past few years and needs

178
00:06:17,350 --> 00:06:15,360
to be refilled with ammonia in order for

179
00:06:19,189 --> 00:06:17,360
it to keep properly functioning

180
00:06:21,430 --> 00:06:19,199
this task isn't as straightforward as it

181
00:06:23,350 --> 00:06:21,440
seems since the p6 truss is isolated

182
00:06:25,590 --> 00:06:23,360
from the primary ammonia tank located on

183
00:06:27,510 --> 00:06:25,600
the p1 side of the truss we will need to

184
00:06:29,749 --> 00:06:27,520
hook up a series of jumpers that span

185
00:06:33,029 --> 00:06:29,759
from the p1 ammonia tank assembly all

186
00:06:34,629 --> 00:06:33,039
the way out board to the p6 truss on eva

187
00:06:36,469 --> 00:06:34,639
1 we will work on setting up those

188
00:06:38,070 --> 00:06:36,479

jumpers and venting the nitrogen pad

189
00:06:41,110 --> 00:06:38,080
that was launched inside these jumpers

190
00:06:43,270 --> 00:06:41,120
in preparation for eva2

191
00:06:45,189 --> 00:06:43,280
we'll finish up the eva by translating

192
00:06:47,270 --> 00:06:45,199
down to the lab and installing two new

193
00:06:49,510 --> 00:06:47,280
antennas in their associated octopus of

194
00:06:51,430 --> 00:06:49,520
cables these antennas will eventually

195
00:06:53,830 --> 00:06:51,440
talk wirelessly to experiments that are

196
00:07:01,749 --> 00:06:53,840
located on the express logistics carrier

197
00:07:07,670 --> 00:07:04,870
ev1 we'll start out at the airlock with

198
00:07:09,430 --> 00:07:07,680
drew feustel and greg chamitov

199
00:07:11,589 --> 00:07:09,440
both crew members will translate out to

200
00:07:13,589 --> 00:07:11,599
the starboard side of the truss

201
00:07:16,309 --> 00:07:13,599
to the elc 2 where they will start their

202
00:07:19,430 --> 00:07:16,319
work on the missy 7a and 7b experiments

203
00:07:21,589 --> 00:07:19,440
they will demate existing electrical and

204
00:07:23,350 --> 00:07:21,599
data cables they will close the the

205
00:07:24,469 --> 00:07:23,360
doors on the experiment they will

206
00:07:31,029 --> 00:07:24,479
release it and then stow it on their

207
00:07:35,189 --> 00:07:32,309
here's some footage from the neutral

208
00:07:40,230 --> 00:07:35,199
buoyancy lab of drew and greg practicing

209
00:07:43,029 --> 00:07:41,589
once they have the experiments both

210
00:07:44,790 --> 00:07:43,039
stowed on their body restraint tethers

211
00:07:46,550 --> 00:07:44,800
they will translate down to endeavour's

212
00:07:48,150 --> 00:07:46,560
payload bay

213
00:07:49,589 --> 00:07:48,160

greg will work on the starboard side of

214
00:07:51,830 --> 00:07:49,599
the payload bay drew will work on the

215
00:07:53,430 --> 00:07:51,840
port side they will work on transferring

216
00:07:54,790 --> 00:07:53,440
the missing experiments from their body

217
00:07:57,350 --> 00:07:54,800
restraint tethers to the sidewall

218
00:07:59,029 --> 00:07:57,360
carriers for the return trip home

219
00:08:00,710 --> 00:07:59,039
drew will translate aft in the payload

220
00:08:02,550 --> 00:08:00,720
bay then to retrieve the missy 8

221
00:08:03,909 --> 00:08:02,560
experiment

222
00:08:06,869 --> 00:08:03,919
both crew members will then translate

223
00:08:08,309 --> 00:08:06,879
back up to the s3 truss

224
00:08:10,309 --> 00:08:08,319
drew will translate to the top of the

225
00:08:13,189 --> 00:08:10,319
elc2 once again where he will install

226
00:08:13,990 --> 00:08:13,199
the new missy 8 you'll open the cover on

227
00:08:15,430 --> 00:08:14,000
it

228
00:08:17,670 --> 00:08:15,440
and then install two connectors

229
00:08:22,070 --> 00:08:17,680
providing data and power you also take

230
00:08:25,909 --> 00:08:24,070
meanwhile greg will work on installing a

231
00:08:27,270 --> 00:08:25,919
light on the s3 truss this is called a

232
00:08:29,430 --> 00:08:27,280
cedar light or crew equipment and

233
00:08:30,629 --> 00:08:29,440
translation aid light

234
00:08:32,469 --> 00:08:30,639
here's a photo of the light in the

235
00:08:33,990 --> 00:08:32,479
install location the light has a single

236
00:08:35,750 --> 00:08:34,000
bolt and there's a single electrical

237
00:08:36,550 --> 00:08:35,760
connector that provides power to this

238
00:08:37,990 --> 00:08:36,560

light

239
00:08:39,350 --> 00:08:38,000
once he's complete at that work site

240
00:08:42,149 --> 00:08:39,360
he'll translate a little further

241
00:08:43,589 --> 00:08:42,159
outboard to the p3 sarge or sola alpha

242
00:08:45,430 --> 00:08:43,599
rotary joint where he will work on

243
00:08:47,190 --> 00:08:45,440
reinstalling a cover that protects that

244
00:08:49,430 --> 00:08:47,200
sarge this cover was first removed

245
00:08:51,750 --> 00:08:49,440
during an increment 16 eva this cover

246
00:08:53,110 --> 00:08:51,760
has six bolts

247
00:08:54,470 --> 00:08:53,120
once complete on the starboard side of

248
00:08:55,829 --> 00:08:54,480
the truss both crew members will

249
00:08:57,590 --> 00:08:55,839
translate over to the port side of the

250
00:09:00,470 --> 00:08:57,600
truss to start setting up for that fill

251
00:09:01,910 --> 00:09:00,480
on eva2 they will demate a 16 foot long

252
00:09:03,910 --> 00:09:01,920
jumper that we have that's currently

253
00:09:05,670 --> 00:09:03,920
stowed on the p4 bulkhead they will need

254
00:09:07,829 --> 00:09:05,680
to lock the port sarge in order to do

255
00:09:09,910 --> 00:09:07,839
this greg will work on installing the

256
00:09:11,590 --> 00:09:09,920
port side of the p4 side of this jumper

257
00:09:14,949 --> 00:09:11,600
and drew will work on installing the p3

258
00:09:18,150 --> 00:09:16,230
once they have that jumper installed

259
00:09:20,710 --> 00:09:18,160
drew will translate outboard to the p5

260
00:09:22,630 --> 00:09:20,720
p6 junction where he will demate

261
00:09:24,310 --> 00:09:22,640
a fluid line he will mate it up to a

262
00:09:25,990 --> 00:09:24,320
nitrogen vent tool at this point in time

263
00:09:28,230 --> 00:09:26,000

we have a continuous pipeline running

264
00:09:30,310 --> 00:09:28,240
from p5 all the way into the p1 ammonia

265
00:09:38,389 --> 00:09:30,320
tank assembly he will vent the nitrogen

266
00:09:41,829 --> 00:09:39,910
and then he will translate outboard to

267
00:09:45,590 --> 00:09:41,839
the final jumper that runs to the p6

268
00:09:47,030 --> 00:09:45,600
pvtcs he will dema demate that jumper

269
00:09:48,790 --> 00:09:47,040
make the nitrogen vent tool and then

270
00:09:58,070 --> 00:09:48,800
once again vent the nitrogen pad from

271
00:10:01,509 --> 00:09:59,350
once we're complete with venting the

272
00:10:03,110 --> 00:10:01,519
nitrogen from the p3 p4 jumper we will

273
00:10:04,870 --> 00:10:03,120
need to demate one side of it in order

274
00:10:07,190 --> 00:10:04,880
to allow the port sarge to rotate

275
00:10:09,110 --> 00:10:07,200
between evas for power generation so

276
00:10:10,550 --> 00:10:09,120
greg will work on demating the p3 side

277
00:10:12,069 --> 00:10:10,560
of that jumper

278
00:10:13,990 --> 00:10:12,079
he will route it back over to its

279
00:10:15,590 --> 00:10:14,000
stowage panel on p4 where he will mate

280
00:10:17,430 --> 00:10:15,600
it and then he will secure the line with

281
00:10:19,350 --> 00:10:17,440
a wire tie on a handrail to ensure that

282
00:10:23,990 --> 00:10:19,360
it doesn't get caught up in the serge

283
00:10:28,710 --> 00:10:25,990
both crew members will then translate

284
00:10:30,230 --> 00:10:28,720
over to the u.s lab node 2 interface on

285
00:10:35,030 --> 00:10:30,240
the nader side there where they will set

286
00:10:39,190 --> 00:10:37,350
drew will first set up a medium bag that

287
00:10:43,269 --> 00:10:39,200
contains the two antennas as well as

288
00:10:46,310 --> 00:10:45,190

and greg will start his work on the top

289
00:10:48,150 --> 00:10:46,320
side of the lab where he will be

290
00:10:49,670 --> 00:10:48,160
removing two existing handrails and

291
00:10:51,350 --> 00:10:49,680
installing two new and hand rails that

292
00:10:52,389 --> 00:10:51,360
already have the antennas integrated on

293
00:11:01,590 --> 00:10:52,399
them

294
00:11:07,670 --> 00:11:03,670
here's a flight photo

295
00:11:09,190 --> 00:11:07,680
integrated on the handrail and here's

296
00:11:13,990 --> 00:11:09,200
some footage from the neutral buoyancy

297
00:11:17,350 --> 00:11:15,829
he's complete he will translate nader on

298
00:11:19,509 --> 00:11:17,360
the lab to help drew with their next

299
00:11:21,750 --> 00:11:19,519
task of installing this octopus of cable

300
00:11:23,110 --> 00:11:21,760
they will release a gap spanner open up

301
00:11:25,509 --> 00:11:23,120
a shield which will

302
00:11:27,590 --> 00:11:25,519
which will reveal an existing ews or

303
00:11:29,590 --> 00:11:27,600
external wireless instrumentation system

304
00:11:31,910 --> 00:11:29,600
cable which they will demate and then

305
00:11:33,670 --> 00:11:31,920
they will work on installing this new

306
00:11:35,269 --> 00:11:33,680
set of cables they have two connections

307
00:11:36,949 --> 00:11:35,279
that they need to make underneath this

308
00:11:39,030 --> 00:11:36,959
shield then they will work on routing

309
00:11:40,389 --> 00:11:39,040
the six legs of this cable

310
00:11:42,150 --> 00:11:40,399
once they've made those connections

311
00:11:43,990 --> 00:11:42,160
under the shield they'll work together

312
00:11:45,670 --> 00:11:44,000
to close it up and install the two zeus

313
00:11:46,949 --> 00:11:45,680

fasteners three zeus fasteners that hold

314
00:11:49,030 --> 00:11:46,959
it down

315
00:11:49,990 --> 00:11:49,040
they will then finish de-mating that old

316
00:11:51,990 --> 00:11:50,000
e-wiss

317
00:11:53,750 --> 00:11:52,000
cable it will be tempted in a bag to

318
00:11:56,150 --> 00:11:53,760
return inside

319
00:11:57,670 --> 00:11:56,160
they will route two lines of this cable

320
00:12:00,550 --> 00:11:57,680
up to the antennas that greg just

321
00:12:03,750 --> 00:12:02,150
it will route another two lines and

322
00:12:05,670 --> 00:12:03,760
they'll just temp stow those for future

323
00:12:06,949 --> 00:12:05,680
use

324
00:12:08,870 --> 00:12:06,959
and then they will finally install the

325
00:12:10,550 --> 00:12:08,880
final two legs of this cable into those

326
00:12:15,269 --> 00:12:10,560
e-whis antennas so that that system

327
00:12:17,990 --> 00:12:16,470
once they're complete at the work site

328
00:12:19,670 --> 00:12:18,000
greg will reinstall the gap spanner and

329
00:12:22,310 --> 00:12:19,680
work on ensuring all the tools have been

330
00:12:24,870 --> 00:12:22,320
stowed inside the medium bag to return

331
00:12:26,230 --> 00:12:24,880
back to the air lock and drew will head

332
00:12:28,389 --> 00:12:26,240
off early to translate back to the

333
00:12:30,790 --> 00:12:28,399
airlock to start more preparation work

334
00:12:34,470 --> 00:12:30,800
for the eva2 ammonia fill he will

335
00:12:36,310 --> 00:12:34,480
retrieve a few tools from the larger

336
00:12:39,910 --> 00:12:36,320
fluid quick disconnect bag which he will

337
00:12:41,750 --> 00:12:39,920
relocate to the vent tool extender bag

338
00:12:43,509 --> 00:12:41,760

he will also work on retrieving from the

339
00:12:45,110 --> 00:12:43,519
airlock a bag that contains two of the

340
00:12:47,670 --> 00:12:45,120
power jumper cables that we will be

341
00:12:49,190 --> 00:12:47,680
installing on eva3 our airlock is so

342
00:12:51,750 --> 00:12:49,200
full on eva3 that we need to

343
00:12:55,910 --> 00:12:51,760
preemptively stow these cables external

344
00:12:58,790 --> 00:12:57,430
once complete with that task both crew

345
00:13:00,389 --> 00:12:58,800
members will translate back to the

346
00:13:04,710 --> 00:13:00,399
airlock they will ingress and that

347
00:13:09,750 --> 00:13:07,110
eva2 has two main objectives the first

348
00:13:11,829 --> 00:13:09,760
of those objectives is to finish up the

349
00:13:13,990 --> 00:13:11,839
ammonia fill of the p6 cooling system

350
00:13:15,590 --> 00:13:14,000
that we set up for on eva1 once this

351
00:13:17,670 --> 00:13:15,600
fill is complete we need to vent

352
00:13:19,990 --> 00:13:17,680
residual ammonia from those lines and we

353
00:13:22,389 --> 00:13:20,000
will do this in two separate vents the

354
00:13:24,949 --> 00:13:22,399
next major task on this eva is to

355
00:13:27,990 --> 00:13:24,959
perform a re-lubrication of the port

356
00:13:29,590 --> 00:13:28,000
sarge or solar alpha rotary joint this

357
00:13:32,550 --> 00:13:29,600
preventative maintenance was first

358
00:13:34,230 --> 00:13:32,560
performed on the sts-126 mission in

359
00:13:36,629 --> 00:13:34,240
order to do this we will remove six

360
00:13:38,389 --> 00:13:36,639
protective covers over the sarge we will

361
00:13:40,710 --> 00:13:38,399
use two different styles of grease guns

362
00:13:42,550 --> 00:13:40,720
to apply a first coat of lubrication to

363
00:13:45,030 --> 00:13:42,560

the sarge we will then wait for the

364
00:13:46,550 --> 00:13:45,040
ground to rotate the starch 200 degrees

365
00:13:48,310 --> 00:13:46,560
we'll come back out apply the second

366
00:13:49,990 --> 00:13:48,320
coat of lubrication and then reinstall

367
00:13:51,750 --> 00:13:50,000
those protective covers

368
00:13:53,750 --> 00:13:51,760
while this 200 degree rotation of the

369
00:13:56,150 --> 00:13:53,760
sarge is ongoing we have a few tasks for

370
00:13:58,710 --> 00:13:56,160
the crew members to perform drew will be

371
00:14:01,269 --> 00:13:58,720
utilizing his grease gun once again to

372
00:14:02,949 --> 00:14:01,279
apply a thin coat of grease to dexter's

373
00:14:04,949 --> 00:14:02,959
latching end effector he will apply

374
00:14:07,269 --> 00:14:04,959
grease to those snares to help it

375
00:14:09,110 --> 00:14:07,279
function properly and mike will work on

376
00:14:11,750 --> 00:14:09,120
installing some stowage beams that will

377
00:14:12,790 --> 00:14:11,760
eventually hold radiator grapple bars so

378
00:14:17,350 --> 00:14:12,800
with that we can go ahead and roll the

379
00:14:20,949 --> 00:14:19,269
eva2 will start out at the airlock once

380
00:14:23,430 --> 00:14:20,959
again with crew members drew feustel and

381
00:14:24,389 --> 00:14:23,440
mike fink

382
00:14:27,110 --> 00:14:24,399
drew

383
00:14:28,790 --> 00:14:27,120
the airlock where he will retrieve the

384
00:14:31,110 --> 00:14:28,800
ventral extender bag he will still that

385
00:14:32,710 --> 00:14:31,120
in his body restraint tether

386
00:14:34,550 --> 00:14:32,720
mike will retrieve a medium bag that

387
00:14:36,550 --> 00:14:34,560
contains the tools for his port sarge

388
00:14:38,470 --> 00:14:36,560

lubrication he will translate out to the

389
00:14:40,389 --> 00:14:38,480
port sarge and set up shop out there

390
00:14:41,590 --> 00:14:40,399
with his bag

391
00:14:43,829 --> 00:14:41,600
they will then work together to

392
00:14:47,269 --> 00:14:43,839
reinstall that p3p4 jumper that was

393
00:14:50,230 --> 00:14:47,279
temporarily stowed at the end of eva1

394
00:14:51,750 --> 00:14:50,240
drew will reconnect the p3 side

395
00:14:53,670 --> 00:14:51,760
then he will translate outward to the

396
00:14:59,110 --> 00:14:53,680
midpoint of p6 where he will temporarily

397
00:15:04,230 --> 00:15:00,949
meanwhile mike will make his way back to

398
00:15:06,790 --> 00:15:04,240
the p the p1 a 500 panel which we call

399
00:15:08,150 --> 00:15:06,800
home plate this panel is is hooked up to

400
00:15:09,910 --> 00:15:08,160
the ammonia tank assembly which is a

401
00:15:11,670 --> 00:15:09,920
large box above mic it's currently set

402
00:15:13,269 --> 00:15:11,680
up for a vent configuration in a

403
00:15:15,430 --> 00:15:13,279
contingency case when they needed to

404
00:15:16,949 --> 00:15:15,440
vent the ammonia tank he will relocate

405
00:15:18,949 --> 00:15:16,959
it to a fill location which will now

406
00:15:20,870 --> 00:15:18,959
allow ammonia to flow from this ammonia

407
00:15:23,030 --> 00:15:20,880
tank outboard so at this time the ground

408
00:15:25,030 --> 00:15:23,040
will perform an initial leak check of

409
00:15:26,550 --> 00:15:25,040
the pipeline to verify everything solid

410
00:15:27,910 --> 00:15:26,560
and it looks good

411
00:15:29,350 --> 00:15:27,920
once the leak check is complete

412
00:15:31,829 --> 00:15:29,360
verifying we have a good line from the

413
00:15:34,389 --> 00:15:31,839

ammonia tank assembly out to p5 drew

414
00:15:36,710 --> 00:15:34,399
will mate a p5 p6 jumper allowing the

415
00:15:38,310 --> 00:15:36,720
ammonia to flow even further outboard

416
00:15:40,550 --> 00:15:38,320
then he will translate out to the final

417
00:15:42,389 --> 00:15:40,560
jumper where he will throw two valves

418
00:15:45,670 --> 00:15:42,399
which will allow ammonia to finally flow

419
00:15:46,949 --> 00:15:45,680
to its final destination of the p6 pvtcs

420
00:15:49,350 --> 00:15:46,959
this ammonia fill should take

421
00:15:51,269 --> 00:15:49,360
approximately 10 minutes

422
00:15:53,030 --> 00:15:51,279
during that time he will be setting up

423
00:15:54,949 --> 00:15:53,040
the vent tool extension in preparation

424
00:15:56,470 --> 00:15:54,959
for the two vents that we need to do he

425
00:15:59,430 --> 00:15:56,480
will aim the nozzle of the vent tool

426
00:16:01,110 --> 00:15:59,440
extension in a retrograde direction

427
00:16:03,110 --> 00:16:01,120
once we're complete with the fill drew

428
00:16:04,629 --> 00:16:03,120
will demate one side of this jumper and

429
00:16:07,509 --> 00:16:04,639
we'll install a cap to ensure the

430
00:16:09,350 --> 00:16:07,519
ammonia stays nicely inside that pvtcs

431
00:16:11,269 --> 00:16:09,360
then he will work on routing the ventral

432
00:16:19,269 --> 00:16:11,279
extension line inboard to set up for the

433
00:16:23,350 --> 00:16:21,269
to start the vent he will demate the p5

434
00:16:25,509 --> 00:16:23,360
jumper from its p6 male and made it up

435
00:16:27,430 --> 00:16:25,519
to the vent tool extension

436
00:16:29,430 --> 00:16:27,440
once he starts this vent it takes about

437
00:16:30,870 --> 00:16:29,440
17 minutes to vent the ammonia that's

438
00:16:35,189 --> 00:16:30,880

running from this jumper all the way

439
00:16:38,310 --> 00:16:36,790
while all of the outboard operations

440
00:16:39,350 --> 00:16:38,320
have been going on with the fill and

441
00:16:41,269 --> 00:16:39,360
vent

442
00:16:43,509 --> 00:16:41,279
mike has been working diligently at the

443
00:16:45,269 --> 00:16:43,519
port sarge to start that lubrication his

444
00:16:47,590 --> 00:16:45,279
first task is to remove the six

445
00:16:49,430 --> 00:16:47,600
protective covers over the sarge

446
00:16:51,350 --> 00:16:49,440
once he has those covers removed he will

447
00:16:53,189 --> 00:16:51,360
be using an eva camera to take some

448
00:16:55,910 --> 00:16:53,199
pictures and then he will also be using

449
00:16:58,310 --> 00:16:55,920
an eva wipe to take some samples of the

450
00:17:00,629 --> 00:16:58,320
grease that was left over from sts-126

451
00:17:02,870 --> 00:17:00,639
so folks on the ground can analyze that

452
00:17:04,789 --> 00:17:02,880
he will then make use of two grease guns

453
00:17:06,710 --> 00:17:04,799
to perform this lubrication the top left

454
00:17:08,630 --> 00:17:06,720
picture shows the j-hook nozzle grease

455
00:17:16,710 --> 00:17:08,640
gun and the top right shows the straight

456
00:17:21,350 --> 00:17:19,270
once the 17-minute vent is complete

457
00:17:23,510 --> 00:17:21,360
drew will remate the p5 jumper to its

458
00:17:25,350 --> 00:17:23,520
dummy mail on p5 and he will work on

459
00:17:33,909 --> 00:17:25,360
rerouting the vent tool extension

460
00:17:37,029 --> 00:17:35,350
this smaller jumper vent should only

461
00:17:38,549 --> 00:17:37,039
take approximately four minutes however

462
00:17:40,710 --> 00:17:38,559
it has the unique constraint that we

463
00:17:42,150 --> 00:17:40,720

need to initiate this vent during an

464
00:17:43,830 --> 00:17:42,160
eclipse pass

465
00:17:45,590 --> 00:17:43,840
so if the day night cycles do not work

466
00:17:47,830 --> 00:17:45,600
out in our favor drew will simply head

467
00:17:49,750 --> 00:17:47,840
inboard and assist mike in the port

468
00:17:52,549 --> 00:17:49,760
sarge lubrication he has his own set of

469
00:17:54,070 --> 00:17:52,559
grease guns to help out with this

470
00:17:57,029 --> 00:17:54,080
once we're done with the four minute

471
00:18:02,950 --> 00:17:57,039
vent drew will relocate this jumper to a

472
00:18:06,630 --> 00:18:04,789
and then he will work on coiling and

473
00:18:12,310 --> 00:18:06,640
stowing the ventral extension back in

474
00:18:15,750 --> 00:18:14,070
then he will stow the ventual extension

475
00:18:19,190 --> 00:18:15,760
bag on his body restraint tether and he

476
00:18:23,590 --> 00:18:20,630
now that we're complete with the ammonia

477
00:18:25,110 --> 00:18:23,600
fill we need to stow the p3p4 jumper so

478
00:18:28,230 --> 00:18:25,120
the two crew members will work together

479
00:18:30,150 --> 00:18:28,240
to install it back on its p4 stowage

480
00:18:32,630 --> 00:18:30,160
bulkhead

481
00:18:34,470 --> 00:18:32,640
and then once we verify that all

482
00:18:36,070 --> 00:18:34,480
tools tethers and crew members are

483
00:18:38,150 --> 00:18:36,080
inboard of the sarge we'll give the

484
00:18:40,870 --> 00:18:38,160
ground a go to start its 200 degree

485
00:18:42,390 --> 00:18:40,880
rotation this rotation will not be

486
00:18:44,310 --> 00:18:42,400
nearly as fast as shown here it will

487
00:18:46,710 --> 00:18:44,320
take approximately 45 minutes to do this

488
00:18:48,630 --> 00:18:46,720

200 degree rotation

489
00:18:49,990 --> 00:18:48,640
while that's ongoing drew will translate

490
00:18:51,909 --> 00:18:50,000
back to the home plate panel to

491
00:18:53,669 --> 00:18:51,919
reconfigure that jumper to the vent

492
00:18:56,950 --> 00:18:53,679
location for the ammonia tank assembly

493
00:18:58,470 --> 00:18:56,960
in a contingency case

494
00:19:00,150 --> 00:18:58,480
and then he will translate up to the

495
00:19:02,470 --> 00:19:00,160
port crew equipment aid in translation

496
00:19:03,990 --> 00:19:02,480
or ceda cart where he will retrieve a

497
00:19:05,750 --> 00:19:04,000
foot restraint he will still then in his

498
00:19:08,710 --> 00:19:05,760
body restraint tether and then translate

499
00:19:10,390 --> 00:19:08,720
to the nader side of the p1 truss

500
00:19:12,630 --> 00:19:10,400
at this time he'll start working with

501
00:19:14,230 --> 00:19:12,640
box who's inside the station flying the

502
00:19:16,230 --> 00:19:14,240
station's robotic arm which is grappled

503
00:19:17,669 --> 00:19:16,240
to dexter

504
00:19:19,750 --> 00:19:17,679
drew and box will work together to

505
00:19:21,270 --> 00:19:19,760
maneuver dexter so that drew can install

506
00:19:23,110 --> 00:19:21,280
his foot restraint and then he will work

507
00:19:24,950 --> 00:19:23,120
on installing a lens cover over the

508
00:19:28,470 --> 00:19:24,960
camera that's on

509
00:19:30,150 --> 00:19:28,480
that's on dexter's latching end effector

510
00:19:31,350 --> 00:19:30,160
he will then work on retrieving the

511
00:19:32,549 --> 00:19:31,360
straight nozzle grease gun that he

512
00:19:33,590 --> 00:19:32,559
brought with him

513
00:19:35,590 --> 00:19:33,600

and he will start performing the

514
00:19:39,510 --> 00:19:35,600
lubrication on spdm's latching and

515
00:19:42,230 --> 00:19:40,789
here's a view of what drew will be

516
00:19:43,909 --> 00:19:42,240
looking at you can see the snares

517
00:19:45,510 --> 00:19:43,919
located inside the latching defector and

518
00:19:47,510 --> 00:19:45,520
also the camera that he just installed

519
00:19:49,190 --> 00:19:47,520
the lens cover on here's some footage

520
00:19:55,110 --> 00:19:49,200
from the neutral buoyancy lab of drew

521
00:19:58,070 --> 00:19:56,630
once they're complete with the full

522
00:19:59,990 --> 00:19:58,080
lubrication

523
00:20:01,909 --> 00:20:00,000
drew will work with box to maneuver

524
00:20:09,830 --> 00:20:01,919
dexter once again so that he can utilize

525
00:20:13,190 --> 00:20:11,190
drew will then retrieve that foot

526
00:20:19,990 --> 00:20:13,200
restraint and stow it back on the port

527
00:20:23,029 --> 00:20:21,669
meanwhile mike had translated back to

528
00:20:24,950 --> 00:20:23,039
the airlock and he had stowed the

529
00:20:26,470 --> 00:20:24,960
ventual extension bag back on top of the

530
00:20:28,870 --> 00:20:26,480
airlock where it was originally located

531
00:20:30,630 --> 00:20:28,880
prior to the eva he also retrieved a

532
00:20:32,630 --> 00:20:30,640
medium bag that contained the two

533
00:20:34,870 --> 00:20:32,640
grapple bar stowage beams

534
00:20:36,630 --> 00:20:34,880
then translates to the zenith side of s1

535
00:20:38,630 --> 00:20:36,640
where he works on installing first the

536
00:20:40,710 --> 00:20:38,640
inboard grapple bar stowage beam this

537
00:20:42,390 --> 00:20:40,720
beam has two bolts and then he'll work

538
00:20:47,510 --> 00:20:42,400

on installing the outboard stowage beam

539
00:20:50,710 --> 00:20:49,029
once both crew members are complete with

540
00:20:51,990 --> 00:20:50,720
their work inboard of the sarge and the

541
00:20:53,750 --> 00:20:52,000
ground is verified that the surge

542
00:20:55,510 --> 00:20:53,760
rotation is complete both crew members

543
00:20:57,669 --> 00:20:55,520
will translate outboard to finish up the

544
00:20:59,669 --> 00:20:57,679
port sarge lubrication they will use

545
00:21:01,830 --> 00:20:59,679
their own sets of guns to apply one more

546
00:21:03,590 --> 00:21:01,840
final coat of lubrication to the sarge

547
00:21:05,830 --> 00:21:03,600
race ring then they will work together

548
00:21:07,350 --> 00:21:05,840
to reinstall the six covers that protect

549
00:21:09,110 --> 00:21:07,360
the sarge

550
00:21:11,190 --> 00:21:09,120
four of these six covers have four bolts

551
00:21:16,549 --> 00:21:11,200
apiece and two of these covers have six

552
00:21:19,350 --> 00:21:17,830
once they're complete with the cover

553
00:21:21,270 --> 00:21:19,360
install they're verified that they have

554
00:21:23,190 --> 00:21:21,280
all of their tools and tethers packed

555
00:21:24,870 --> 00:21:23,200
inside that medium bag

556
00:21:26,470 --> 00:21:24,880
they will retrieve that verify the work

557
00:21:31,029 --> 00:21:26,480
site is clear then they will translate

558
00:21:31,039 --> 00:21:41,750
and that completes eva ii

559
00:21:45,909 --> 00:21:43,990
eva3 will be spent mostly on the russian

560
00:21:47,510 --> 00:21:45,919
segment so we're very lucky to have mike

561
00:21:49,909 --> 00:21:47,520
fink with all of his vast russian

562
00:21:52,149 --> 00:21:49,919
experience performing this eva the first

563
00:21:54,870 --> 00:21:52,159

task will be to install a power and data

564
00:21:56,470 --> 00:21:54,880
grapple fixture on the russian fgb the

565
00:21:58,950 --> 00:21:56,480
power and data grapple fixture along

566
00:22:00,549 --> 00:21:58,960
with its power and data cables and a

567
00:22:02,950 --> 00:22:00,559
video signal conditioner that we will

568
00:22:04,950 --> 00:22:02,960
install next to it will allow the ssrms

569
00:22:07,270 --> 00:22:04,960
or stations robotic arm to eventually

570
00:22:09,350 --> 00:22:07,280
walk off and use this as a base

571
00:22:11,669 --> 00:22:09,360
for future use once we're complete with

572
00:22:13,510 --> 00:22:11,679
that task we will work on installing

573
00:22:15,190 --> 00:22:13,520
the two power cables that we temp stowed

574
00:22:18,070 --> 00:22:15,200
outside the airlock at the end of eva

575
00:22:19,669 --> 00:22:18,080
one we refer to these as y-jumper cables

576
00:22:21,750 --> 00:22:19,679
we have a port side cable and a

577
00:22:24,310 --> 00:22:21,760
starboard side cable these cables run

578
00:22:27,270 --> 00:22:24,320
from node one port node one forward to

579
00:22:30,149 --> 00:22:27,280
node one nader and then a node one

580
00:22:32,470 --> 00:22:30,159
afternator and then back to the fgb

581
00:22:35,110 --> 00:22:32,480
and this will provide a redundancy to

582
00:22:36,789 --> 00:22:35,120
the russian segment and its power so

583
00:22:41,350 --> 00:22:36,799
with that we can go ahead and roll eva3

584
00:22:45,510 --> 00:22:43,669
eva 3 will start out at the joint

585
00:22:47,510 --> 00:22:45,520
airlock once again with crew members

586
00:22:49,669 --> 00:22:47,520
drew feustel and mike fink drew will

587
00:22:51,190 --> 00:22:49,679
first work on relocating that power

588
00:22:56,470 --> 00:22:51,200

cable bag that he temp slowed at the end

589
00:22:59,669 --> 00:22:57,830
mike will work on retrieving a

590
00:23:01,270 --> 00:22:59,679
medium-sized bag with a crew lock bag

591
00:23:02,870 --> 00:23:01,280
inside of it and he will set up shop on

592
00:23:11,190 --> 00:23:02,880
the port side of the truss

593
00:23:14,310 --> 00:23:12,870
mike will then install a gap spanner

594
00:23:17,909 --> 00:23:14,320
that will help with the translation

595
00:23:21,029 --> 00:23:19,270
and the two crew members will work

596
00:23:23,430 --> 00:23:21,039
together to remove five pieces of

597
00:23:24,870 --> 00:23:23,440
multi-layer insulation or mli that's

598
00:23:28,149 --> 00:23:24,880
currently protecting the install

599
00:23:30,070 --> 00:23:28,159
locations for the pdgf and the vsc once

600
00:23:31,830 --> 00:23:30,080
this mli is removed they will bundle it

601
00:23:33,750 --> 00:23:31,840
together with a wire tie and then use a

602
00:23:35,510 --> 00:23:33,760
few additional wire ties to secure it to

603
00:23:37,430 --> 00:23:35,520
a handrail in the russian segment this

604
00:23:39,990 --> 00:23:37,440
mli will probably be jettisoned on a

605
00:23:41,750 --> 00:23:40,000
future russian eva

606
00:23:43,350 --> 00:23:41,760
both crew members will then translate

607
00:23:45,990 --> 00:23:43,360
back to the airlock to assist one

608
00:23:47,750 --> 00:23:46,000
another with retrieving the pdgf and its

609
00:23:49,190 --> 00:23:47,760
frame as you can see it's a fairly large

610
00:23:50,789 --> 00:23:49,200
piece of equipment so they will both be

611
00:23:52,710 --> 00:23:50,799
tethered to it and

612
00:23:55,350 --> 00:23:52,720
kind of instrument back to its install

613
00:23:56,950 --> 00:23:55,360

location on the port side of the fgb

614
00:23:58,310 --> 00:23:56,960
once they get it soft docked they will

615
00:24:01,909 --> 00:23:58,320
tighten the three feet that hold the

616
00:24:06,549 --> 00:24:03,510
then they will work on installing the

617
00:24:08,470 --> 00:24:06,559
video signal conditioner this vsc has a

618
00:24:10,230 --> 00:24:08,480
single bolt

619
00:24:12,149 --> 00:24:10,240
and then they will route three cables

620
00:24:14,070 --> 00:24:12,159
that are installed on the pdgf to this

621
00:24:15,590 --> 00:24:14,080
video signal conditioner then they will

622
00:24:17,590 --> 00:24:15,600
retrieve and route a fourth cable which

623
00:24:20,789 --> 00:24:17,600
was temporarily stowed by a previous

624
00:24:23,990 --> 00:24:22,549
once that's installed

625
00:24:25,990 --> 00:24:24,000
once all the cables are installed they

626
00:24:28,230 --> 00:24:26,000
will install a hard protective cover on

627
00:24:29,750 --> 00:24:28,240
top of the vsc so at this point in time

628
00:24:31,830 --> 00:24:29,760
that we will start work on installing

629
00:24:33,830 --> 00:24:31,840
the y-jumpers

630
00:24:36,870 --> 00:24:33,840
first retrieve the port jumper and then

631
00:24:38,789 --> 00:24:36,880
he will make his way up to the forward

632
00:24:40,710 --> 00:24:38,799
zenith side of node one into an area we

633
00:24:42,630 --> 00:24:40,720
call the rat's nest because there are so

634
00:24:44,549 --> 00:24:42,640
so many cables inside there he will

635
00:24:46,950 --> 00:24:44,559
demate an existing cable from the rat's

636
00:24:49,029 --> 00:24:46,960
nest and temp stow this y-jumper then he

637
00:24:50,870 --> 00:24:49,039
will translate to node one aft nader

638
00:24:54,710 --> 00:24:50,880

where he will demate another existing

639
00:24:56,310 --> 00:24:54,720
connector and temp stow the y-jumper

640
00:24:59,830 --> 00:24:56,320
at this point time drew will start his

641
00:25:02,070 --> 00:24:59,840
work on the pma-1 fgb interface where he

642
00:25:03,990 --> 00:25:02,080
will demand a connector from the fgb

643
00:25:05,590 --> 00:25:04,000
made it to this new y-jumper and then he

644
00:25:07,430 --> 00:25:05,600
will also demate

645
00:25:09,909 --> 00:25:07,440
a second connector which will route down

646
00:25:12,149 --> 00:25:09,919
to the pdgf once drew is complete with

647
00:25:14,789 --> 00:25:12,159
his work he will give mike a go to start

648
00:25:17,029 --> 00:25:14,799
making his connections mike will make

649
00:25:19,190 --> 00:25:17,039
the rat's nest cable to one end of the y

650
00:25:20,870 --> 00:25:19,200
jumper he will then secure the cable

651
00:25:23,830 --> 00:25:20,880
with wire ties to make sure it doesn't

652
00:25:25,350 --> 00:25:23,840
interfere with translation paths

653
00:25:28,070 --> 00:25:25,360
and then he will translate back down to

654
00:25:32,470 --> 00:25:28,080
node one nader aft again where he will

655
00:25:33,909 --> 00:25:32,480
mate up the second leg of the y-jumper

656
00:25:36,070 --> 00:25:33,919
at this point in time we've completed

657
00:25:37,669 --> 00:25:36,080
work on the port side of the y-jumper

658
00:25:39,190 --> 00:25:37,679
install the ground will start verifying

659
00:25:40,870 --> 00:25:39,200
the connections we made and we'll also

660
00:25:43,029 --> 00:25:40,880
start putting inhibits in place for the

661
00:25:44,950 --> 00:25:43,039
starboard side of these y-jumpers this

662
00:25:46,789 --> 00:25:44,960
task should take about 45 minutes so

663
00:25:50,149 --> 00:25:46,799

during that time we will finish up the

664
00:25:52,710 --> 00:25:50,159
pdgf install by routing the final 1553

665
00:25:54,789 --> 00:25:52,720
data cable this cable routes from

666
00:26:02,950 --> 00:25:54,799
connectors coming off of the pdgf and

667
00:26:05,990 --> 00:26:04,390
once complete with that work and once we

668
00:26:07,750 --> 00:26:06,000
verify that the ground has the inhibits

669
00:26:08,789 --> 00:26:07,760
in place for the starboard y jumper

670
00:26:09,990 --> 00:26:08,799
install

671
00:26:11,669 --> 00:26:10,000
mike will make his way with the

672
00:26:13,430 --> 00:26:11,679
starboard cable back up to the rat's

673
00:26:14,789 --> 00:26:13,440
nest area once again this time on the

674
00:26:16,789 --> 00:26:14,799
starboard side

675
00:26:20,950 --> 00:26:16,799
he will demate an existing rat's nest

676
00:26:24,549 --> 00:26:22,470
then he will translate to node one

677
00:26:29,430 --> 00:26:24,559
afternator where he will demate an

678
00:26:33,110 --> 00:26:30,870
and then drew will start his work once

679
00:26:35,190 --> 00:26:33,120
again on the pma1 fgb interface where he

680
00:26:36,950 --> 00:26:35,200
will demate an fgb cable that he hooks

681
00:26:38,390 --> 00:26:36,960
up to his y-jumper

682
00:26:40,470 --> 00:26:38,400
and then he'll demand a second cable

683
00:26:42,149 --> 00:26:40,480
from the fgb which will route down to

684
00:26:43,669 --> 00:26:42,159
the pdgf

685
00:26:45,190 --> 00:26:43,679
just like on the starboard side once

686
00:26:47,350 --> 00:26:45,200
drew is done with his work he'll give

687
00:26:49,830 --> 00:26:47,360
mike the go mike will start making his

688
00:26:52,390 --> 00:26:49,840

connections he'll first hook up the rats

689
00:26:56,070 --> 00:26:52,400
nest cable to the y jumper

690
00:26:59,750 --> 00:26:57,750
and then make his way

691
00:27:03,510 --> 00:26:59,760
to the node 1 nader aft where he'll

692
00:27:04,950 --> 00:27:03,520
finish up the y jumper install task

693
00:27:07,190 --> 00:27:04,960
once complete both crew members will

694
00:27:09,350 --> 00:27:07,200
translate back over to the pdgf install

695
00:27:11,750 --> 00:27:09,360
site mike will work on cleaning up the

696
00:27:13,669 --> 00:27:11,760
work site and drew will take photos of

697
00:27:15,269 --> 00:27:13,679
the fgb thrusters which are located

698
00:27:17,669 --> 00:27:15,279
right there as well as the newly

699
00:27:19,590 --> 00:27:17,679
installed pdgf both crew members will

700
00:27:25,190 --> 00:27:19,600
then translate back to the airlock and

701
00:27:29,990 --> 00:27:27,830
eva4 is mainly dedicated to stowing

702
00:27:31,909 --> 00:27:30,000
endeavour's orbital boom sensor system

703
00:27:34,389 --> 00:27:31,919
or boom as i'll refer to it on the space

704
00:27:35,990 --> 00:27:34,399
station for a future contingency use in

705
00:27:38,789 --> 00:27:36,000
order to stow this we'll make use of

706
00:27:40,549 --> 00:27:38,799
stands that the sts-123 mission first

707
00:27:43,750 --> 00:27:40,559
used when they stowed the boom in pres

708
00:27:46,389 --> 00:27:43,760
in preparation for sts-124 in order to

709
00:27:48,789 --> 00:27:46,399
get the most use out of this boom as a

710
00:27:50,470 --> 00:27:48,799
contingency tool on station we will need

711
00:27:52,230 --> 00:27:50,480
to change out the grapple fixture which

712
00:27:55,029 --> 00:27:52,240
is located at the end of the boom the

713
00:27:57,029 --> 00:27:55,039

boom currently has an efgf or electrical

714
00:27:58,789 --> 00:27:57,039
flight releasable grapple fixture and

715
00:28:00,870 --> 00:27:58,799
this grapple fixture is not compatible

716
00:28:02,310 --> 00:28:00,880
with the station's robotic arm so we

717
00:28:04,710 --> 00:28:02,320
will work on removing that grapple

718
00:28:07,269 --> 00:28:04,720
fixture and then retrieving a power and

719
00:28:09,110 --> 00:28:07,279
data grapple fixture pdgf from p6 which

720
00:28:11,029 --> 00:28:09,120
is no longer being used and we will

721
00:28:13,190 --> 00:28:11,039
install that on the orbiter boom sensor

722
00:28:16,149 --> 00:28:13,200
system in order to make it more useful

723
00:28:19,110 --> 00:28:16,159
for future station contingencies we'll

724
00:28:21,190 --> 00:28:19,120
finish out the eva on the p3 truss and

725
00:28:23,750 --> 00:28:21,200
the newly installed express logistics

726
00:28:25,830 --> 00:28:23,760
carrier 3 doing some work on dexter's

727
00:28:28,710 --> 00:28:25,840
spare arm which launched on this carrier

728
00:28:30,389 --> 00:28:28,720
when the sts-123 mission first assembled

729
00:28:32,070 --> 00:28:30,399
dexter they had some difficulty

730
00:28:34,230 --> 00:28:32,080
releasing the fasteners that held

731
00:28:36,230 --> 00:28:34,240
dexter's arm and the launch equipment

732
00:28:37,990 --> 00:28:36,240
and so in order to make lives easier for

733
00:28:39,590 --> 00:28:38,000
future station crews and the unlikely

734
00:28:41,510 --> 00:28:39,600
event that they'll need dexter's spare

735
00:28:43,190 --> 00:28:41,520
arm we're going to preemptively release

736
00:28:45,669 --> 00:28:43,200
those fasteners using a specially

737
00:28:47,830 --> 00:28:45,679
designed tool to help lighten the load

738
00:28:48,870 --> 00:28:47,840

on our crew members

739
00:28:52,870 --> 00:28:48,880
with that we can go ahead and roll the

740
00:28:56,710 --> 00:28:54,710
eva 4 will start at the joint airlock

741
00:28:59,110 --> 00:28:56,720
once again with crew members mike fink

742
00:29:00,950 --> 00:28:59,120
and greg chamitov

743
00:29:03,269 --> 00:29:00,960
mike will have a medium bag that

744
00:29:05,110 --> 00:29:03,279
contains the adapter assembly that we

745
00:29:07,269 --> 00:29:05,120
will need to install the pdgf on the

746
00:29:08,950 --> 00:29:07,279
boom he will temporarily stow that on

747
00:29:11,430 --> 00:29:08,960
the s1 truss

748
00:29:12,950 --> 00:29:11,440
and greg will work on reconfiguring and

749
00:29:15,909 --> 00:29:12,960
retrieving a foot restraint which is

750
00:29:17,350 --> 00:29:15,919
currently on the airlock toolbox

751
00:29:19,190 --> 00:29:17,360
he'll stow that on his body restraint

752
00:29:21,190 --> 00:29:19,200
tether and then translate up to the s1

753
00:29:23,029 --> 00:29:21,200
truss

754
00:29:27,750 --> 00:29:23,039
once he's up there he will install that

755
00:29:31,110 --> 00:29:29,430
then he will ingress it ingress the foot

756
00:29:33,110 --> 00:29:31,120
restraint and then both crew members

757
00:29:34,710 --> 00:29:33,120
will work on their own respective stands

758
00:29:36,470 --> 00:29:34,720
and they'll work with box who's inside

759
00:29:38,389 --> 00:29:36,480
the station flying the station's robotic

760
00:29:40,470 --> 00:29:38,399
arm which is grappled to the midpoint of

761
00:29:42,149 --> 00:29:40,480
the boom they'll work together to back

762
00:29:44,389 --> 00:29:42,159
the boom into place to where the eva

763
00:29:46,070 --> 00:29:44,399

crew members can take control of it

764
00:29:47,830 --> 00:29:46,080
box will back off the arm and the two

765
00:29:50,230 --> 00:29:47,840
eva crew members will work together to

766
00:29:52,630 --> 00:29:50,240
slowly back the boom into the stands

767
00:29:55,110 --> 00:29:52,640
they will then lock it in place

768
00:29:57,269 --> 00:29:55,120
mike will start work on the sensor end

769
00:29:59,430 --> 00:29:57,279
of the boom

770
00:30:00,870 --> 00:29:59,440
since without the efgf there's no way to

771
00:30:02,149 --> 00:30:00,880
apply power to these sensors they're

772
00:30:03,990 --> 00:30:02,159
eventually going to die so we will

773
00:30:05,510 --> 00:30:04,000
demate the electrical connectors from

774
00:30:06,950 --> 00:30:05,520
these sensors and install two new

775
00:30:10,789 --> 00:30:06,960
grounding connectors which will ground

776
00:30:14,470 --> 00:30:12,789
while that works ongoing greg is

777
00:30:16,310 --> 00:30:14,480
reconfiguring a foot restraint and

778
00:30:17,909 --> 00:30:16,320
working with box to maneuver the arm

779
00:30:26,789 --> 00:30:17,919
back so greg can install that foot

780
00:30:29,750 --> 00:30:28,310
greg will be using the arm as a work

781
00:30:38,149 --> 00:30:29,760
platform later in the eva for the

782
00:30:42,310 --> 00:30:39,590
both crew members will then translate

783
00:30:43,830 --> 00:30:42,320
all the way out board to the p6 truss

784
00:30:45,990 --> 00:30:43,840
greg will work on setting up the foot

785
00:30:47,510 --> 00:30:46,000
restraint for mike to ingress mike will

786
00:30:49,590 --> 00:30:47,520
hop in the foot restraint install a

787
00:30:51,029 --> 00:30:49,600
handling aid on the pdgf and then

788
00:30:52,950 --> 00:30:51,039

together they will release the four

789
00:30:54,389 --> 00:30:52,960
fasteners that are holding the pdgf on

790
00:30:56,149 --> 00:30:54,399
the p6 truss

791
00:31:00,070 --> 00:30:56,159
once released they will stow the grapple

792
00:31:01,669 --> 00:31:00,080
fixture on mike's body restraint tether

793
00:31:02,710 --> 00:31:01,679
and greg will retrieve the foot

794
00:31:04,149 --> 00:31:02,720
restraint

795
00:31:05,990 --> 00:31:04,159
both crew members will then start making

796
00:31:08,310 --> 00:31:06,000
their way back towards the s1 truss and

797
00:31:09,509 --> 00:31:08,320
the boom greg will make a quick pit stop

798
00:31:14,630 --> 00:31:09,519
where he will drop off that foot

799
00:31:18,310 --> 00:31:16,549
and then greg will work with box to

800
00:31:19,669 --> 00:31:18,320
slowly maneuver the arm into position to

801
00:31:25,190 --> 00:31:19,679
where greg can ingress the foot

802
00:31:28,789 --> 00:31:26,789
greg will then maneuver over to mike

803
00:31:30,549 --> 00:31:28,799
where he will retrieve the pdgf and stow

804
00:31:32,310 --> 00:31:30,559
that on his body restraint tether and

805
00:31:35,430 --> 00:31:32,320
then both crew members will translate up

806
00:31:37,430 --> 00:31:35,440
to the grapple fixture swap location

807
00:31:39,669 --> 00:31:37,440
they will work on releasing the efgf

808
00:31:41,029 --> 00:31:39,679
which has six bolts once they release

809
00:31:43,190 --> 00:31:41,039
that they will need to peel back the

810
00:31:45,509 --> 00:31:43,200
efgf and cut the electrical cable that

811
00:31:47,029 --> 00:31:45,519
runs down to those sensors mike will

812
00:31:49,190 --> 00:31:47,039
stow that in the medium bag then they

813
00:31:50,870 --> 00:31:49,200

will work on installing the pdgf adapter

814
00:31:52,630 --> 00:31:50,880
assembly or paa

815
00:31:54,549 --> 00:31:52,640
this has six bolts and then it provides

816
00:31:58,310 --> 00:31:54,559
a mounting ring for the pdgf to be

817
00:32:01,430 --> 00:31:59,830
they'll then work together to install

818
00:32:04,070 --> 00:32:01,440
the pdgf and tighten down the four

819
00:32:05,669 --> 00:32:04,080
fasteners that hold it in place

820
00:32:07,909 --> 00:32:05,679
and we now have a new grapple fixture on

821
00:32:09,509 --> 00:32:07,919
the end of the boom

822
00:32:11,430 --> 00:32:09,519
greg will then work with box to maneuver

823
00:32:13,269 --> 00:32:11,440
back to his egress position where he

824
00:32:15,029 --> 00:32:13,279
will egress the apfr and then catch a

825
00:32:17,509 --> 00:32:15,039
free ride over to the starboard seat of

826
00:32:20,549 --> 00:32:19,110
greg we'll transfer the foot restraint

827
00:32:31,990 --> 00:32:20,559
from the arm

828
00:32:36,389 --> 00:32:34,070
greg then translates to the zenith f

829
00:32:38,310 --> 00:32:36,399
side of s zero where he inspects and

830
00:32:40,549 --> 00:32:38,320
cinches a long duration title tether

831
00:32:45,509 --> 00:32:40,559
which is currently holding down dexter's

832
00:32:49,350 --> 00:32:47,269
meanwhile mike has retrieved that medium

833
00:32:51,029 --> 00:32:49,360
bag that contained the efgf which was

834
00:32:53,110 --> 00:32:51,039
removed from the boom and he translates

835
00:32:54,789 --> 00:32:53,120
down to endeavour's payload bay once

836
00:32:56,870 --> 00:32:54,799
he's down there he opens up the door on

837
00:32:59,750 --> 00:32:56,880
endeavour's port toolbox or tool stowage

838
00:33:01,990 --> 00:32:59,760

assembly and he will transfer the efgf

839
00:33:04,230 --> 00:33:02,000
grapple fixture from his medium bag to

840
00:33:07,350 --> 00:33:04,240
this port tsa so it can return home with

841
00:33:11,669 --> 00:33:09,590
once he's complete stowing that grapple

842
00:33:12,470 --> 00:33:11,679
fixture in the tsa he will close the

843
00:33:14,870 --> 00:33:12,480
door

844
00:33:16,230 --> 00:33:14,880
and tighten the four latches

845
00:33:18,870 --> 00:33:16,240
and then both crew members will start

846
00:33:21,029 --> 00:33:18,880
making their way out to the port truss

847
00:33:23,029 --> 00:33:21,039
once out on p3

848
00:33:24,710 --> 00:33:23,039
they will translate along the newly

849
00:33:26,789 --> 00:33:24,720
installed express logistics carrier

850
00:33:28,789 --> 00:33:26,799
elc-3 and this is where they will work

851
00:33:30,950 --> 00:33:28,799
on releasing the three fasteners that

852
00:33:33,590 --> 00:33:30,960
held dexter's spare arm in place for

853
00:33:37,669 --> 00:33:35,669
once the first fastener is is released

854
00:33:39,430 --> 00:33:37,679
they will work together to use a 40 inch

855
00:33:41,190 --> 00:33:39,440
long pry rod this was the tool that was

856
00:33:42,950 --> 00:33:41,200
specially designed for this task one

857
00:33:44,870 --> 00:33:42,960
crew member will insert this pry load

858
00:33:46,470 --> 00:33:44,880
and offload the adjacent fasteners as

859
00:33:47,590 --> 00:33:46,480
the other crew member releases those

860
00:33:50,630 --> 00:33:47,600
fasteners

861
00:33:57,430 --> 00:33:50,640
are two clamps that are still holding

862
00:34:01,110 --> 00:33:59,110
once complete with that task greg will

863
00:34:02,789 --> 00:34:01,120

translate to the opposite side of elc 3

864
00:34:04,070 --> 00:34:02,799
where he will install a protective cover

865
00:34:06,310 --> 00:34:04,080
on the grapple fixture on the high

866
00:34:07,990 --> 00:34:06,320
pressure gas tank he will also take some

867
00:34:13,270 --> 00:34:08,000
photos of a dod

868
00:34:16,710 --> 00:34:14,950
both crew members will clean up their

869
00:34:19,109 --> 00:34:16,720
work site and translate back to the

870
00:34:21,510 --> 00:34:19,119
joint airlock they will ingress

871
00:34:22,950 --> 00:34:21,520
and we will be closing the hatch for the

872
00:34:24,950 --> 00:34:22,960
final time

873
00:34:32,149 --> 00:34:24,960
on an eva conducted by space shuttle

874
00:34:35,510 --> 00:34:33,510
so with that that completes my briefing

875
00:34:37,270 --> 00:34:35,520
i'll hand it back over to you okay let's

876
00:34:38,869 --> 00:34:37,280
take some questions here at the johnson

877
00:34:40,710 --> 00:34:38,879
space center first and we'll see if we

878
00:34:42,950 --> 00:34:40,720
have any of the other centers

879
00:34:44,790 --> 00:34:42,960
who would like to go first go ahead

880
00:34:47,909 --> 00:34:44,800
mark kramer from cbs

881
00:34:50,149 --> 00:34:47,919
the pdgf that comes off p6 was that a

882
00:34:51,829 --> 00:34:50,159
spare or was that used actively and

883
00:34:54,310 --> 00:34:51,839
taking it away does that mean you lose

884
00:34:55,990 --> 00:34:54,320
some capability it was used so that pdgf

885
00:34:57,750 --> 00:34:56,000
doesn't have any power or anything

886
00:35:00,150 --> 00:34:57,760
provided to it so it was never used as a

887
00:35:03,030 --> 00:35:00,160
base for the ssrms it was used when they

888
00:35:04,630 --> 00:35:03,040

first installed p6 on top of z1 during

889
00:35:06,630 --> 00:35:04,640
the foray mission

890
00:35:09,430 --> 00:35:06,640
so it's just it's just out there now not

891
00:35:16,710 --> 00:35:11,670
anyone else

892
00:35:20,950 --> 00:35:18,790
marcia done associated press

893
00:35:23,109 --> 00:35:20,960
um because you had that one extra day

894
00:35:25,270 --> 00:35:23,119
maybe um if you didn't get everything

895
00:35:27,589 --> 00:35:25,280
done during four would you consider a 50

896
00:35:28,870 --> 00:35:27,599
va or are you pretty hard down with four

897
00:35:30,150 --> 00:35:28,880
this time

898
00:35:32,310 --> 00:35:30,160
i think i think we'll be pretty good

899
00:35:34,069 --> 00:35:32,320
with with four evas i don't think it

900
00:35:36,390 --> 00:35:34,079
with that plus one day since we only

901
00:35:38,470 --> 00:35:36,400
have three total crew members we can't

902
00:35:40,069 --> 00:35:38,480
do back-to-back evas so we would need to

903
00:35:42,310 --> 00:35:40,079
add two additional days in order to

904
00:35:44,230 --> 00:35:42,320
support a fifth eva but i think we

905
00:35:46,069 --> 00:35:44,240
should have enough time and this crew is

906
00:35:47,589 --> 00:35:46,079
so well trained that i don't think we

907
00:35:49,109 --> 00:35:47,599
should we should easily be able to fit

908
00:35:51,829 --> 00:35:49,119
all of our nominal tasks within our four

909
00:35:56,790 --> 00:35:53,990
okay claire

910
00:35:58,790 --> 00:35:56,800
hi clara moskowitz with space.com um can

911
00:36:01,270 --> 00:35:58,800
you just talk about in general how these

912
00:36:04,230 --> 00:36:01,280
evas rate in terms of difficulty and

913
00:36:05,829 --> 00:36:04,240

complexity to general evas and also just

914
00:36:07,510 --> 00:36:05,839
how much time the crews have had to put

915
00:36:09,829 --> 00:36:07,520
in to rehearse these

916
00:36:11,510 --> 00:36:09,839
okay great question so let's see i'll

917
00:36:13,030 --> 00:36:11,520
fir i'll answer your second question

918
00:36:14,950 --> 00:36:13,040
first so

919
00:36:16,150 --> 00:36:14,960
in terms of the number of runs that

920
00:36:17,589 --> 00:36:16,160
we've done in the neutral buoyancy lab

921
00:36:19,109 --> 00:36:17,599
for each of the evas it's helped that

922
00:36:20,790 --> 00:36:19,119
we've slipped about nine months since

923
00:36:23,910 --> 00:36:20,800
our original launch date in july so for

924
00:36:25,589 --> 00:36:23,920
eva's one and two we've done 10 runs eva

925
00:36:27,430 --> 00:36:25,599
3 since that was added later in the flow

926
00:36:30,069 --> 00:36:27,440
we've done four runs of that and then

927
00:36:31,910 --> 00:36:30,079
we've done nine runs of eva four

928
00:36:33,510 --> 00:36:31,920
so that's ten ten

929
00:36:36,150 --> 00:36:33,520
four and nine

930
00:36:38,390 --> 00:36:36,160
so in terms of difficulty i would say i

931
00:36:41,190 --> 00:36:38,400
think evas one three and four are

932
00:36:43,190 --> 00:36:41,200
probably standard difficulty level evas

933
00:36:45,270 --> 00:36:43,200
eva2 is the one that

934
00:36:47,430 --> 00:36:45,280
involves quite a bit of choreography

935
00:36:50,630 --> 00:36:47,440
between the ground for both the the

936
00:36:52,069 --> 00:36:50,640
refill of the of the p6 cooling system

937
00:36:53,430 --> 00:36:52,079
the crew members have to wait for goes

938
00:36:55,030 --> 00:36:53,440

from the ground and then have to give

939
00:36:57,030 --> 00:36:55,040
the ground goes and so there's quite a

940
00:36:58,870 --> 00:36:57,040
bit of choreography between

941
00:37:00,710 --> 00:36:58,880
between that fill task and also just the

942
00:37:02,470 --> 00:37:00,720
sheer number of fluid quick disconnects

943
00:37:04,390 --> 00:37:02,480
that we're touching during this eva

944
00:37:06,710 --> 00:37:04,400
those fluid qd's have historically

945
00:37:09,109 --> 00:37:06,720
caused quite a few problems during evas

946
00:37:10,950 --> 00:37:09,119
so we have i think it's a total of 11

947
00:37:12,630 --> 00:37:10,960
fluid fluid cuties that we're touching

948
00:37:14,470 --> 00:37:12,640
throughout this eva multiple times we're

949
00:37:16,310 --> 00:37:14,480
opening and closing them both a few

950
00:37:17,589 --> 00:37:16,320
times on eva one but most of the time on

951
00:37:18,870 --> 00:37:17,599
eva ii

952
00:37:20,630 --> 00:37:18,880
so that's probably one of the most

953
00:37:22,150 --> 00:37:20,640
difficult and challenging tasks on this

954
00:37:23,430 --> 00:37:22,160
flight

955
00:37:35,190 --> 00:37:23,440
okay

956
00:37:39,109 --> 00:37:36,950
angie king with harvard journalism can

957
00:37:40,870 --> 00:37:39,119
you explain again what is it about what

958
00:37:45,030 --> 00:37:40,880
you call the slow hokey pokey that

959
00:37:47,109 --> 00:37:45,040
exercise that makes the aisle possible

960
00:37:48,790 --> 00:37:47,119
i'm definitely not a medical doctor and

961
00:37:50,470 --> 00:37:48,800
i did not stay at a holiday inn express

962
00:37:52,470 --> 00:37:50,480
last night so i can't even pretend to be

963
00:37:54,870 --> 00:37:52,480

one but it's my understanding that it's

964
00:37:56,470 --> 00:37:54,880
it's all about the oxygen exchange so

965
00:37:58,710 --> 00:37:56,480
just the fact that you're in the suit

966
00:38:00,150 --> 00:37:58,720
and you're exerting you know you're

967
00:38:01,349 --> 00:38:00,160
exerting yourself a little bit and

968
00:38:02,790 --> 00:38:01,359
you're kind of getting your heart rate

969
00:38:04,630 --> 00:38:02,800
up so your blood's pumping a little bit

970
00:38:06,470 --> 00:38:04,640
faster and it's so it's all about

971
00:38:08,310 --> 00:38:06,480
exertion level and so you're exchanging

972
00:38:10,230 --> 00:38:08,320
oxygen at a higher rate and then the

973
00:38:11,750 --> 00:38:10,240
actual movement itself helps move any

974
00:38:13,829 --> 00:38:11,760
little nitrogen bubbles that might be in

975
00:38:15,109 --> 00:38:13,839
the veins so it's all about

976
00:38:17,030 --> 00:38:15,119
just kind of working yourself out a

977
00:38:19,349 --> 00:38:17,040
little bit and like you saw it's very

978
00:38:20,470 --> 00:38:19,359
very light exercise that we're talking

979
00:38:21,750 --> 00:38:20,480
about here because we don't want the

980
00:38:23,670 --> 00:38:21,760
crew members to wear themselves out

981
00:38:26,230 --> 00:38:23,680
before they go out the door but just

982
00:38:30,069 --> 00:38:26,240
anything over just sitting there helps

983
00:38:33,990 --> 00:38:30,950
okay

984
00:38:37,829 --> 00:38:35,910
marshad and associated press again this

985
00:38:39,670 --> 00:38:37,839
will be the last shuttle crew going out

986
00:38:42,710 --> 00:38:39,680
on a spacewalk ever

987
00:38:44,470 --> 00:38:42,720
um have you given that much thought or

988
00:38:45,349 --> 00:38:44,480

what what are your thoughts about

989
00:38:46,790 --> 00:38:45,359
you know

990
00:38:48,790 --> 00:38:46,800
30 years of

991
00:38:50,150 --> 00:38:48,800
you know shuttle program ending in the

992
00:38:53,829 --> 00:38:50,160
last the very last shuttle-based

993
00:38:55,910 --> 00:38:53,839
spacewalk right well you know i grew up

994
00:38:58,710 --> 00:38:55,920
i hate to admit it but i was born after

995
00:39:00,950 --> 00:38:58,720
sts-1 so i have only ever known a world

996
00:39:02,710 --> 00:39:00,960
that's had shuttle flights in it so it's

997
00:39:04,710 --> 00:39:02,720
it's going to be a very a very

998
00:39:06,950 --> 00:39:04,720
bittersweet but very proud moment for me

999
00:39:08,470 --> 00:39:06,960
to be able to help execute

1000
00:39:10,470 --> 00:39:08,480
these evas

1001
00:39:11,670 --> 00:39:10,480
and you know i think life aboard the

1002
00:39:13,349 --> 00:39:11,680
space station is still going to be

1003
00:39:15,109 --> 00:39:13,359
exciting in terms of evas we're still

1004
00:39:16,870 --> 00:39:15,119
going to be doing spacewalk so my job

1005
00:39:19,190 --> 00:39:16,880
personally won't won't change that much

1006
00:39:20,390 --> 00:39:19,200
but we'll continue to do spacewalks

1007
00:39:22,630 --> 00:39:20,400
but i think it'll just be a very

1008
00:39:23,990 --> 00:39:22,640
exciting time to actually complete to

1009
00:39:26,230 --> 00:39:24,000
help complete the the space shuttle

1010
00:39:27,349 --> 00:39:26,240
program

1011
00:39:30,950 --> 00:39:27,359
all right is that it in here i think we

1012
00:39:34,150 --> 00:39:32,710
i had to throw it in there sorry we're

1013
00:39:35,430 --> 00:39:34,160

going to wrap up today's briefing coming

1014
00:39:37,630 --> 00:39:35,440
up at two o'clock is going to be the

1015
00:39:39,910 --> 00:39:37,640
crew news conference with the entire

1016
00:39:41,910 --> 00:39:39,920
sts-134 crew so we will take a quick

1017
00:39:42,950 --> 00:39:41,920
break here on nasa tv we will see you