



1
00:00:05,590 --> 00:00:03,750
good morning once again from nasa's

2
00:00:07,990 --> 00:00:05,600
johnson space center in houston as we

3
00:00:10,310 --> 00:00:08,000
continue to take a look at the sts-132

4
00:00:12,310 --> 00:00:10,320
mission and atlantis upcoming flight to

5
00:00:13,669 --> 00:00:12,320
the international space station here to

6
00:00:15,110 --> 00:00:13,679
give us more details about all of the

7
00:00:17,189 --> 00:00:15,120
spacewalks that are planned for this

8
00:00:20,230 --> 00:00:17,199
flight is lisa shore she is the lead

9
00:00:23,349 --> 00:00:20,240
spacewalk officer for sts-132 go ahead

10
00:00:26,630 --> 00:00:23,359
lisa thank you josh

11
00:00:29,109 --> 00:00:26,640
for sts-132 our

12
00:00:31,589 --> 00:00:29,119
spacewalk plan is actually pretty simple

13
00:00:33,910 --> 00:00:31,599

they have three full spacewalks

14

00:00:35,990 --> 00:00:33,920

planned with one simple goal

15

00:00:37,910 --> 00:00:36,000

and that is to install the hardware that

16

00:00:39,910 --> 00:00:37,920

we brought up on a carrier in the

17

00:00:40,869 --> 00:00:39,920

shuttle payload bay under the space

18

00:00:42,069 --> 00:00:40,879

station

19

00:00:46,229 --> 00:00:42,079

from here on out i'm going to be

20

00:00:48,549 --> 00:00:46,239

referring to that carrier as the pallet

21

00:00:51,990 --> 00:00:48,559

the pallet has the redundant space to

22

00:00:54,389 --> 00:00:52,000

ground antenna and boom

23

00:00:57,350 --> 00:00:54,399

on one side along with a platform that's

24

00:00:59,110 --> 00:00:57,360

going to install onto the dexter robot

25

00:01:01,830 --> 00:00:59,120

and then on the other side

26

00:01:03,750 --> 00:01:01,840

we have six batteries

27

00:01:05,670 --> 00:01:03,760

that we're going to install into the

28

00:01:08,070 --> 00:01:05,680

space station to replace

29

00:01:09,990 --> 00:01:08,080

the ones on the foremost solar array

30

00:01:13,109 --> 00:01:10,000

very similar to what took place almost a

31

00:01:15,270 --> 00:01:13,119

year ago on sts-127

32

00:01:17,030 --> 00:01:15,280

the whole crew has going to be involved

33

00:01:19,749 --> 00:01:17,040

in our evas

34

00:01:21,510 --> 00:01:19,759

our commander commander ken ham

35

00:01:24,710 --> 00:01:21,520

will be getting the guys suited up ready

36

00:01:26,950 --> 00:01:24,720

to go out the door for each of the evas

37

00:01:28,149 --> 00:01:26,960

our pilot today antonelli

38

00:01:31,270 --> 00:01:28,159

will be guiding the crew through the

39

00:01:33,270 --> 00:01:31,280

procedures during each of the spacewalks

40

00:01:34,710 --> 00:01:33,280

and then pure sellers himself a veteran

41

00:01:36,710 --> 00:01:34,720

spacewalker

42

00:01:37,830 --> 00:01:36,720

will be our lead space station arm

43

00:01:39,510 --> 00:01:37,840

operator

44

00:01:42,630 --> 00:01:39,520

in the arm is very involved in the

45

00:01:44,630 --> 00:01:42,640

operations of each of these evas

46

00:01:45,590 --> 00:01:44,640

steve bowen mike good and garrett

47

00:01:47,749 --> 00:01:45,600

riesman

48

00:01:50,069 --> 00:01:47,759

again all veteran spacewalkers

49

00:01:51,429 --> 00:01:50,079

will be each be performing two of our

50

00:01:53,190 --> 00:01:51,439

evas

51
00:01:55,830 --> 00:01:53,200
and they'll each take the lead for one

52
00:01:58,310 --> 00:01:55,840
of those evas

53
00:01:59,910 --> 00:01:58,320
as you watch the video you'll see

54
00:02:01,350 --> 00:01:59,920
steve will be wearing the suit with the

55
00:02:03,030 --> 00:02:01,360
red stripe

56
00:02:04,709 --> 00:02:03,040
mike will always wear the suit with the

57
00:02:07,109 --> 00:02:04,719
barber pole stripes

58
00:02:09,910 --> 00:02:07,119
and garrett will wear the unmarked or

59
00:02:13,510 --> 00:02:11,589
for eva one

60
00:02:15,589 --> 00:02:13,520
garrett riesman and steve bowen will be

61
00:02:17,589 --> 00:02:15,599
going out the door garrett will take the

62
00:02:19,430 --> 00:02:17,599
lead on this eva

63
00:02:22,229 --> 00:02:19,440

prior to egress

64

00:02:23,990 --> 00:02:22,239

for this eva the station arm will have

65

00:02:26,550 --> 00:02:24,000

pulled the pallet out of the shuttle

66

00:02:27,990 --> 00:02:26,560

payload bay and installed it

67

00:02:29,430 --> 00:02:28,000

onto the port side of the mobile

68

00:02:31,750 --> 00:02:29,440

transporter

69

00:02:36,949 --> 00:02:31,760

on the truss and we can go ahead and

70

00:02:41,270 --> 00:02:39,030

here you can see is we're going to fly

71

00:02:43,750 --> 00:02:41,280

into our first work site you can see the

72

00:02:45,830 --> 00:02:43,760

mobile transporter

73

00:02:48,550 --> 00:02:45,840

just to the port side of center on the

74

00:02:50,229 --> 00:02:48,560

space station we have the dexter

75

00:02:52,390 --> 00:02:50,239

robot installed on the left side and the

76

00:02:53,750 --> 00:02:52,400

pallet over on the right

77

00:02:55,030 --> 00:02:53,760

the first task that the crew will

78

00:02:56,949 --> 00:02:55,040

perform

79

00:02:58,390 --> 00:02:56,959

will be to

80

00:03:00,229 --> 00:02:58,400

pick up a couple of portable foot

81

00:03:02,550 --> 00:03:00,239

restraints that were left there

82

00:03:04,630 --> 00:03:02,560

for us by the previous mission

83

00:03:06,390 --> 00:03:04,640

and then they will translate those over

84

00:03:08,149 --> 00:03:06,400

to the palette

85

00:03:10,949 --> 00:03:08,159

you can see the palette there

86

00:03:12,390 --> 00:03:10,959

uh that's the six batteries on the one

87

00:03:13,830 --> 00:03:12,400

side that are on the side of the palette

88

00:03:15,350 --> 00:03:13,840

away from the truss

89
00:03:21,750 --> 00:03:15,360
and as we come around there you can see

90
00:03:26,070 --> 00:03:23,750
and then the

91
00:03:29,350 --> 00:03:26,080
dexter robot platform

92
00:03:32,390 --> 00:03:29,360
also known as the eotp the enhanced

93
00:03:34,070 --> 00:03:32,400
oru temporary platform

94
00:03:36,229 --> 00:03:34,080
is there next to the dish and then the

95
00:03:38,149 --> 00:03:36,239
boom is below that

96
00:03:39,430 --> 00:03:38,159
here you can see steve installing his

97
00:03:41,350 --> 00:03:39,440
foot restraint

98
00:03:43,589 --> 00:03:41,360
onto the pallet he'll use that to

99
00:03:44,789 --> 00:03:43,599
stabilize himself as they pull the boom

100
00:03:46,470 --> 00:03:44,799
off

101
00:03:47,910 --> 00:03:46,480
and then garrett is going to install his

102
00:03:49,509 --> 00:03:47,920
foot restraint

103
00:03:52,070 --> 00:03:49,519
onto the arm

104
00:03:53,830 --> 00:03:52,080
and here you can see

105
00:03:56,470 --> 00:03:53,840
steve pulling his foot restraint off the

106
00:03:58,070 --> 00:03:56,480
cedar cart that we took out there

107
00:03:59,110 --> 00:03:58,080
once garrett has the foot restraint on

108
00:04:01,589 --> 00:03:59,120
the arm

109
00:04:03,830 --> 00:04:01,599
he's going to translate over

110
00:04:05,750 --> 00:04:03,840
and assist steve with releasing the boom

111
00:04:08,149 --> 00:04:05,760
from the palette

112
00:04:10,229 --> 00:04:08,159
once the boom has been released

113
00:04:12,830 --> 00:04:10,239

steve will continue to stabilize it

114

00:04:15,589 --> 00:04:12,840

garrett will go ahead ingress the

115

00:04:16,310 --> 00:04:15,599

arm steve will rotate

116

00:04:21,830 --> 00:04:16,320

the

117

00:04:24,390 --> 00:04:21,840

dexter palette

118

00:04:26,550 --> 00:04:24,400

hand the boom over to garrett

119

00:04:29,189 --> 00:04:26,560

and then garrett will carefully

120

00:04:30,790 --> 00:04:29,199

maneuver the boom clear of the pallet

121

00:04:32,710 --> 00:04:30,800

once he's clear of the pallet he's going

122

00:04:35,590 --> 00:04:32,720

to go ahead and reposition the boom for

123

00:04:37,430 --> 00:04:35,600

installation at the z1 work site

124

00:04:39,350 --> 00:04:37,440

steve will then pick up his

125

00:04:41,350 --> 00:04:39,360

foot restraint

126

00:04:43,510 --> 00:04:41,360

translate back over to the

127

00:04:46,150 --> 00:04:43,520

port cedar cart which will drop it off

128

00:04:47,510 --> 00:04:46,160

we'll use that later when we install the

129

00:04:49,670 --> 00:04:47,520

pallet onto the

130

00:04:51,270 --> 00:04:49,680

dexter

131

00:04:52,870 --> 00:04:51,280

and then as we fly over here you can see

132

00:04:53,909 --> 00:04:52,880

that one big dish antenna is the

133

00:04:55,670 --> 00:04:53,919

existing

134

00:04:57,030 --> 00:04:55,680

space to ground antenna on the station

135

00:04:58,950 --> 00:04:57,040

and we are going to install the

136

00:05:00,870 --> 00:04:58,960

redundant system

137

00:05:02,629 --> 00:05:00,880

just starboard of it

138

00:05:04,070 --> 00:05:02,639

whereas that first antenna slopes off to

139

00:05:06,629 --> 00:05:04,080

the side ours

140

00:05:08,390 --> 00:05:06,639

will become a new 14 foot tall straight

141

00:05:09,590 --> 00:05:08,400

up structure right

142

00:05:12,390 --> 00:05:09,600

next to it in the center of the space

143

00:05:15,510 --> 00:05:13,830

so garrett you'll see here is about to

144

00:05:19,350 --> 00:05:15,520

do these big uh we'll call windshield

145

00:05:20,469 --> 00:05:19,360

wiper maneuvers over to the z1

146

00:05:22,870 --> 00:05:20,479

once

147

00:05:24,310 --> 00:05:22,880

he's over at the work site

148

00:05:26,150 --> 00:05:24,320

steve will have translated over there

149

00:05:28,550 --> 00:05:26,160

they'll work together

150

00:05:31,350 --> 00:05:28,560

to position the boom you can see here

151

00:05:33,749 --> 00:05:31,360

working in the neutral buoyancy lab

152

00:05:35,430 --> 00:05:33,759

to practice that steve will go ahead and

153

00:05:38,230 --> 00:05:35,440

drive the bolts there's two bolts that

154

00:05:40,870 --> 00:05:38,240

hold the boom onto the z1 and then

155

00:05:42,469 --> 00:05:40,880

garrett will go ahead and fly back

156

00:05:44,070 --> 00:05:42,479

to pick up the dish

157

00:05:45,189 --> 00:05:44,080

while he's gone steve is going to

158

00:05:47,670 --> 00:05:45,199

connect a couple of electrical

159

00:05:50,070 --> 00:05:47,680

connectors to an interface panel

160

00:05:51,670 --> 00:05:50,080

he'll then grab four other electrical

161

00:05:52,629 --> 00:05:51,680

connectors that were pre-positioned for

162

00:05:56,070 --> 00:05:52,639

us

163

00:05:58,070 --> 00:05:56,080

to the boom

164

00:06:00,550 --> 00:05:58,080

and once that is complete if he still

165

00:06:02,550 --> 00:06:00,560

has time he'll translate up the boom

166

00:06:04,390 --> 00:06:02,560

and remove the thermal cover from the

167

00:06:16,629 --> 00:06:04,400

transmit receive box

168

00:06:23,510 --> 00:06:18,870

okay in the meantime we have garrett as

169

00:06:27,590 --> 00:06:25,590

he'll work with piers

170

00:06:29,430 --> 00:06:27,600

to guide himself in there's two bolts

171

00:06:31,990 --> 00:06:29,440

that hold that dish into its support

172

00:06:35,029 --> 00:06:32,000

equipment on the pallet

173

00:06:36,710 --> 00:06:35,039

he'll drive each of those bolts and then

174

00:06:38,790 --> 00:06:36,720

very carefully

175

00:06:41,990 --> 00:06:38,800

start to lift the dish

176
00:06:43,189 --> 00:06:42,000
out of that support equipment

177
00:06:46,070 --> 00:06:43,199
a little bit of a

178
00:06:49,029 --> 00:06:46,080
tight space here so

179
00:06:50,309 --> 00:06:49,039
they'll work together just get clear of

180
00:06:51,670 --> 00:06:50,319
the pallet

181
00:06:52,790 --> 00:06:51,680
then do a little maneuver out from

182
00:06:54,870 --> 00:06:52,800
underneath the

183
00:06:56,550 --> 00:06:54,880
boom of the arm and then again the big

184
00:06:59,029 --> 00:06:56,560
windshield wiper maneuver

185
00:07:00,710 --> 00:06:59,039
back over to the z1

186
00:07:02,070 --> 00:07:00,720
when garrett arrives at the z1 steve

187
00:07:03,670 --> 00:07:02,080
should be waiting for him at the top of

188
00:07:06,309 --> 00:07:03,680

the boom

189

00:07:08,710 --> 00:07:06,319

they're going to again work together to

190

00:07:11,110 --> 00:07:08,720

very gently bring those two interfaces

191

00:07:12,950 --> 00:07:11,120

together there's some very sensitive

192

00:07:15,029 --> 00:07:12,960

areas up the top there where the actual

193

00:07:16,390 --> 00:07:15,039

signal passes through from the antenna

194

00:07:17,909 --> 00:07:16,400

down into the

195

00:07:19,430 --> 00:07:17,919

boom box

196

00:07:20,390 --> 00:07:19,440

that we call it

197

00:07:22,710 --> 00:07:20,400

and

198

00:07:27,510 --> 00:07:22,720

locate go ahead work together drive four

199

00:07:31,029 --> 00:07:28,550

once the

200

00:07:32,230 --> 00:07:31,039

dish is bolted on there's two electrical

201
00:07:34,550 --> 00:07:32,240
connectors

202
00:07:36,710 --> 00:07:34,560
that need to get

203
00:07:38,150 --> 00:07:36,720
connected

204
00:07:40,550 --> 00:07:38,160
and then

205
00:07:42,070 --> 00:07:40,560
just before garrett leaves they'll go

206
00:07:43,670 --> 00:07:42,080
ahead and work together to install a

207
00:07:48,629 --> 00:07:43,680
thermal shield

208
00:07:51,909 --> 00:07:50,070
you can see that's what white section

209
00:07:54,469 --> 00:07:51,919
that just went on there as soon as that

210
00:07:55,589 --> 00:07:54,479
is complete we'll send garrett back over

211
00:07:57,589 --> 00:07:55,599
to the pallet

212
00:07:58,710 --> 00:07:57,599
to start the retrieval of the dexter

213
00:08:00,469 --> 00:07:58,720

platform

214

00:08:02,550 --> 00:08:00,479

steve will then

215

00:08:04,230 --> 00:08:02,560

proceed to remove two launch locks

216

00:08:05,990 --> 00:08:04,240

gimbal locks we call them

217

00:08:07,830 --> 00:08:06,000

on the antenna those immobilize the

218

00:08:11,430 --> 00:08:07,840

antenna during its

219

00:08:14,629 --> 00:08:12,710

and once he is finished with those

220

00:08:16,710 --> 00:08:14,639

gimbal locks he'll go ahead

221

00:08:18,390 --> 00:08:16,720

clean up that z1 work site

222

00:08:19,909 --> 00:08:18,400

drop a bag off at the airlock and then

223

00:08:21,189 --> 00:08:19,919

meet garrett

224

00:08:23,830 --> 00:08:21,199

back over at the dexter for the

225

00:08:25,670 --> 00:08:23,840

installation of the platform

226

00:08:27,830 --> 00:08:25,680

here you can see garrett once he gets

227

00:08:29,430 --> 00:08:27,840

back over to the pallet

228

00:08:33,430 --> 00:08:29,440

he's driving

229

00:08:38,310 --> 00:08:33,440

one of the four bolts here that hold the

230

00:08:44,230 --> 00:08:41,269

and once that platform is released

231

00:08:45,670 --> 00:08:44,240

he'll again go ahead and

232

00:08:47,590 --> 00:08:45,680

pull that away from the pallet and then

233

00:08:49,509 --> 00:08:47,600

again another big sweeping maneuver just

234

00:08:50,949 --> 00:08:49,519

from one side of the mobile transporter

235

00:08:52,550 --> 00:08:50,959

over to the other side

236

00:08:54,070 --> 00:08:52,560

this is kind of like going around the

237

00:08:57,350 --> 00:08:54,080

block to get your next door neighbor's

238

00:09:00,710 --> 00:08:59,350

so then once garrett's over there with

239

00:09:02,630 --> 00:09:00,720

the pallet

240

00:09:04,870 --> 00:09:02,640

he and steve will work together

241

00:09:07,430 --> 00:09:04,880

to insert four fasteners

242

00:09:09,910 --> 00:09:07,440

that hold the pallet onto the dexter

243

00:09:13,350 --> 00:09:09,920

there's also a hinge pin this platform

244

00:09:18,550 --> 00:09:15,350

during future operations for

245

00:09:21,030 --> 00:09:18,560

into what we call a maintenance position

246

00:09:23,430 --> 00:09:21,040

once garrett and steve are complete with

247

00:09:25,030 --> 00:09:23,440

the fasteners garrett will egress the

248

00:09:27,030 --> 00:09:25,040

arm and then send that away to a

249

00:09:29,670 --> 00:09:27,040

position that he can later take the foot

250

00:09:31,190 --> 00:09:29,680

restraint off of it and clean it up

251
00:09:33,990 --> 00:09:31,200
and if we have time at this point

252
00:09:34,710 --> 00:09:34,000
garrett's going to head and install

253
00:10:08,630 --> 00:09:34,720
a

254
00:10:10,470 --> 00:10:08,640
is either for the dexter itself or for

255
00:10:11,590 --> 00:10:10,480
an ev crew to actually rotate that

256
00:10:13,509 --> 00:10:11,600
pallet

257
00:10:15,509 --> 00:10:13,519
180 degrees in either direction

258
00:10:16,870 --> 00:10:15,519
depending on well

259
00:10:19,910 --> 00:10:16,880
what piece of equipment you would like

260
00:10:22,470 --> 00:10:19,920
to temporarily stow there

261
00:10:24,470 --> 00:10:22,480
while all that is taking place

262
00:10:26,150 --> 00:10:24,480
steve will have translated back over to

263
00:10:27,590 --> 00:10:26,160

the pallet to perform some get-ahead

264

00:10:29,990 --> 00:10:27,600

tasks for us

265

00:10:32,790 --> 00:10:30,000

we're going to have him break torque

266

00:10:35,110 --> 00:10:32,800

on the batteries that are on the pallet

267

00:10:35,829 --> 00:10:35,120

so for each of the six batteries he'll

268

00:10:37,269 --> 00:10:35,839

be

269

00:10:38,949 --> 00:10:37,279

opening up the

270

00:10:42,150 --> 00:10:38,959

thermal cover

271

00:10:44,150 --> 00:10:42,160

and then using a ratchet wrench

272

00:10:46,389 --> 00:10:44,160

to release the torque just by putting

273

00:10:48,069 --> 00:10:46,399

one turn on each of those bolts and then

274

00:10:50,069 --> 00:10:48,079

he'll

275

00:10:53,590 --> 00:10:50,079

torque it back down by hand and that's

276

00:10:55,670 --> 00:10:53,600

so that we can easily use our power tool

277

00:10:57,350 --> 00:10:55,680

during evas two and three to remove the

278

00:10:59,110 --> 00:10:57,360

batteries

279

00:11:02,790 --> 00:10:59,120

from the pallet and you can see here

280

00:11:04,790 --> 00:11:02,800

steve practicing that again in the pool

281

00:11:06,150 --> 00:11:04,800

once he's broken torque on

282

00:11:07,990 --> 00:11:06,160

as many of the batteries we can get

283

00:11:10,160 --> 00:11:08,000

through we'd like to get through all six

284

00:11:11,269 --> 00:11:10,170

but it's not required he'll go ahead and

285

00:11:12,710 --> 00:11:11,279

[Music]

286

00:11:15,110 --> 00:11:12,720

close the thermal

287

00:11:17,670 --> 00:11:15,120

cover back up

288

00:11:20,470 --> 00:11:17,680

and that will be the completion of eva

289

00:11:32,710 --> 00:11:20,480

one we'll bring our bags back inside and

290

00:11:35,670 --> 00:11:34,230

okay

291

00:11:39,110 --> 00:11:35,680

for eva

292

00:11:40,630 --> 00:11:39,120

two we'll have steve bowen and mike good

293

00:11:43,670 --> 00:11:40,640

going out the door

294

00:11:46,230 --> 00:11:43,680

steve will take the lead on this eva

295

00:11:48,230 --> 00:11:46,240

prior to egress on this eva the mobile

296

00:11:50,310 --> 00:11:48,240

transporter will move down to its port

297

00:11:52,069 --> 00:11:50,320

most location

298

00:11:54,870 --> 00:11:52,079

on the trust just prior to the solar

299

00:11:57,350 --> 00:11:54,880

array rotary joint

300

00:11:59,509 --> 00:11:57,360

garrett in piers will then work together

301
00:12:00,870 --> 00:11:59,519
to pull the pallet

302
00:12:02,550 --> 00:12:00,880
off of the

303
00:12:04,870 --> 00:12:02,560
mobile transporter

304
00:12:06,310 --> 00:12:04,880
and extend it all the way out to the p6

305
00:12:08,310 --> 00:12:06,320
segment

306
00:12:14,870 --> 00:12:08,320
for the start of the eva

307
00:12:19,110 --> 00:12:16,710
so here you see we're coming into our

308
00:12:20,310 --> 00:12:19,120
work site at the far port end of the

309
00:12:22,550 --> 00:12:20,320
truss

310
00:12:25,030 --> 00:12:22,560
our first task on this eva is going to

311
00:12:27,269 --> 00:12:25,040
be to move a couple of portable foot

312
00:12:29,750 --> 00:12:27,279
restraints and some gap spanner chains

313
00:12:32,310 --> 00:12:29,760

that have been out there since sts-127

314

00:12:34,389 --> 00:12:32,320

back last july

315

00:12:36,310 --> 00:12:34,399

when they did the very similar task of

316

00:12:39,750 --> 00:12:36,320

rnr

317

00:12:41,590 --> 00:12:39,760

those batteries so steve bowen will grab

318

00:12:43,990 --> 00:12:41,600

each of those foot restraints

319

00:12:45,110 --> 00:12:44,000

bring them over to the opposite side of

320

00:12:47,509 --> 00:12:45,120

the truss

321

00:12:49,750 --> 00:12:47,519

where we'll be doing our battery

322

00:12:50,870 --> 00:12:49,760

remove and replace

323

00:12:52,470 --> 00:12:50,880

and

324

00:12:53,990 --> 00:12:52,480

grab those foot restraints grab that gap

325

00:12:55,110 --> 00:12:54,000

spanner chain install it on the other

326
00:12:57,509 --> 00:12:55,120
side

327
00:13:00,629 --> 00:12:57,519
and while steve is doing that

328
00:13:03,750 --> 00:13:00,639
mike will go around and break torque

329
00:13:05,110 --> 00:13:03,760
on each of the six truss batteries again

330
00:13:07,430 --> 00:13:05,120
with a ratchet wrench similar to what

331
00:13:12,310 --> 00:13:07,440
steve did on the pallet for

332
00:13:15,750 --> 00:13:13,670
once they're complete with all those

333
00:13:17,190 --> 00:13:15,760
prep activities

334
00:13:20,150 --> 00:13:17,200
the first thing we need to do this whole

335
00:13:21,590 --> 00:13:20,160
battery rnr is like a shell game or one

336
00:13:22,949 --> 00:13:21,600
of those puzzles where you move the

337
00:13:25,269 --> 00:13:22,959
numbers around the first thing you need

338
00:13:27,670 --> 00:13:25,279

to do is create an open spot

339

00:13:30,470 --> 00:13:27,680

to start your shuffle so we'll install

340

00:13:32,870 --> 00:13:30,480

some handling aids onto the battery

341

00:13:36,150 --> 00:13:32,880

first a battery that we intend to remove

342

00:13:38,710 --> 00:13:36,160

and then we're also going to install a

343

00:13:40,710 --> 00:13:38,720

we call a ball stack it's a tether metal

344

00:13:44,310 --> 00:13:40,720

tether that can be rigidized to

345

00:13:48,629 --> 00:13:46,790

during the evas

346

00:13:52,470 --> 00:13:48,639

so there you see

347

00:13:59,590 --> 00:13:52,480

mike putting that ball stack in place

348

00:14:05,590 --> 00:14:03,350

mike will go ahead and ingress the

349

00:14:07,269 --> 00:14:05,600

foot restraint we call we call mike the

350

00:14:09,750 --> 00:14:07,279

trust guy and steve will be the pallet

351
00:14:11,110 --> 00:14:09,760
guy because mike takes all the batteries

352
00:14:12,870 --> 00:14:11,120
out of the truss and replaces them and

353
00:14:15,030 --> 00:14:12,880
steve will take the batteries out of the

354
00:14:16,389 --> 00:14:15,040
pallet and replace them

355
00:14:17,350 --> 00:14:16,399
so here you can see they're working

356
00:14:18,629 --> 00:14:17,360
together

357
00:14:19,829 --> 00:14:18,639
mike's pulled the battery out of the

358
00:14:21,750 --> 00:14:19,839
truss

359
00:14:24,470 --> 00:14:21,760
and then they pass it down to the

360
00:14:27,110 --> 00:14:24,480
tempstow location

361
00:14:28,710 --> 00:14:27,120
we'll install it onto that ball stack

362
00:14:30,470 --> 00:14:28,720
and then

363
00:14:31,829 --> 00:14:30,480

tuck it under the truss there to keep it

364

00:14:33,670 --> 00:14:31,839

out of the way during the robotics

365

00:14:35,430 --> 00:14:33,680

operations

366

00:14:37,269 --> 00:14:35,440

and then mike will reposition his foot

367

00:14:39,110 --> 00:14:37,279

restraint for the installation of the

368

00:14:40,550 --> 00:14:39,120

battery

369

00:14:43,590 --> 00:14:40,560

at this point

370

00:14:44,710 --> 00:14:43,600

steve will guide the pallet that appears

371

00:14:46,310 --> 00:14:44,720

as

372

00:14:47,910 --> 00:14:46,320

operating the arm there

373

00:14:49,990 --> 00:14:47,920

guide the pallet in for the removal of

374

00:14:51,590 --> 00:14:50,000

the first battery

375

00:14:53,189 --> 00:14:51,600

you know better and the pallet gets

376

00:14:54,550 --> 00:14:53,199

close enough it'll go ahead and open the

377

00:14:58,150 --> 00:14:54,560

thermal clever

378

00:14:59,750 --> 00:14:58,160

install a couple more handling aids pull

379

00:15:01,670 --> 00:14:59,760

that battery out

380

00:15:04,230 --> 00:15:01,680

here you can see them practicing

381

00:15:05,430 --> 00:15:04,240

that again in the pool

382

00:15:06,870 --> 00:15:05,440

training for this was challenging

383

00:15:08,150 --> 00:15:06,880

because since we couldn't put the pallet

384

00:15:10,790 --> 00:15:08,160

on the arm in the pool we had to

385

00:15:15,030 --> 00:15:10,800

actually put the crew member on the arm

386

00:15:17,670 --> 00:15:16,629

so there's steve pulling the battery out

387

00:15:19,910 --> 00:15:17,680

of the

388

00:15:21,670 --> 00:15:19,920

pallet as he'll do on

389

00:15:24,230 --> 00:15:21,680

eva2

390

00:15:25,590 --> 00:15:24,240

once the battery has been removed

391

00:15:27,189 --> 00:15:25,600

they'll work together to what we call

392

00:15:29,509 --> 00:15:27,199

shepherd the battery down to its install

393

00:15:30,870 --> 00:15:29,519

location that's just basically a hand

394

00:15:32,470 --> 00:15:30,880

handoff

395

00:15:35,269 --> 00:15:32,480

from one crew member to the next kind of

396

00:15:37,110 --> 00:15:35,279

inchworm it down the truss

397

00:15:40,230 --> 00:15:37,120

and then

398

00:15:41,829 --> 00:15:40,240

install it back into the truss these

399

00:15:44,150 --> 00:15:41,839

batteries are about three and a half

400

00:15:47,189 --> 00:15:44,160

feet by three and a half feet each

401
00:15:49,430 --> 00:15:47,199
uh weigh about 365 pounds

402
00:15:51,910 --> 00:15:49,440
so you can imagine uh there when steve

403
00:15:53,430 --> 00:15:51,920
is holding the battery now installing it

404
00:15:55,189 --> 00:15:53,440
back into the pallet you can't see a

405
00:15:57,110 --> 00:15:55,199
whole lot more than battery

406
00:15:59,670 --> 00:15:57,120
so it's really important for

407
00:16:02,470 --> 00:15:59,680
our other crew member mike in this case

408
00:16:07,990 --> 00:16:05,430
the battery into the slot without

409
00:16:09,990 --> 00:16:08,000
hitting any of the other equipment

410
00:16:11,670 --> 00:16:10,000
in between the first and second battery

411
00:16:13,910 --> 00:16:11,680
on the pallet there we need to

412
00:16:15,509 --> 00:16:13,920
reposition our foot restraint and then

413
00:16:17,430 --> 00:16:15,519

reposition the pallet

414

00:16:19,030 --> 00:16:17,440

that's to keep that bottom keel pin on

415

00:16:21,350 --> 00:16:19,040

the pallet from

416

00:16:22,949 --> 00:16:21,360

getting too close to the truss

417

00:16:25,269 --> 00:16:22,959

once that's complete we go ahead and

418

00:16:26,629 --> 00:16:25,279

guide the pallet back in again remove

419

00:16:28,150 --> 00:16:26,639

the battery

420

00:16:31,110 --> 00:16:28,160

and then once more

421

00:16:33,509 --> 00:16:31,120

shepard it over to its install location

422

00:16:35,590 --> 00:16:33,519

on the truss

423

00:16:37,590 --> 00:16:35,600

and then one more time here

424

00:16:39,749 --> 00:16:37,600

we'll move our foot restraint

425

00:16:41,910 --> 00:16:39,759

remove the third battery

426
00:16:44,069 --> 00:16:41,920
from the truss shepherd it back over to

427
00:16:45,189 --> 00:16:44,079
the pallet

428
00:16:46,790 --> 00:16:45,199
and then

429
00:16:49,189 --> 00:16:46,800
mike or i'm sorry

430
00:16:55,350 --> 00:16:49,199
steve will install that battery

431
00:16:59,030 --> 00:16:56,949
okay one more time we'll guide the

432
00:17:01,829 --> 00:16:59,040
pallet

433
00:17:03,590 --> 00:17:01,839
up to the next battery

434
00:17:05,510 --> 00:17:03,600
so here you can see the thermal comer

435
00:17:07,669 --> 00:17:05,520
closing on the second battery guide the

436
00:17:10,069 --> 00:17:07,679
pallet down

437
00:17:11,750 --> 00:17:10,079
install the handling aids and then again

438
00:17:14,309 --> 00:17:11,760

remove the battery

439

00:17:16,470 --> 00:17:14,319
from the pallet

440

00:17:18,230 --> 00:17:16,480
and shepard it back over to the truss to

441

00:17:19,829 --> 00:17:18,240
install it so at this point we have

442

00:17:21,750 --> 00:17:19,839
three new batteries installed in the

443

00:17:24,230 --> 00:17:21,760
truss and two of the old batteries put

444

00:17:25,829 --> 00:17:24,240
back on the pallet for return to earth

445

00:17:28,390 --> 00:17:25,839
at the very end there the crew will

446

00:17:29,190 --> 00:17:28,400
retrieve that temp stowed battery

447

00:17:31,029 --> 00:17:29,200
and

448

00:17:33,669 --> 00:17:31,039
put it back into the pallet close up the

449

00:17:35,350 --> 00:17:33,679
mli

450

00:17:38,470 --> 00:17:35,360
and the arm will then maneuver away to a

451
00:17:42,950 --> 00:17:39,909
where it will back out of the way so we

452
00:17:45,750 --> 00:17:42,960
continue to rotate the solar arrays

453
00:17:47,110 --> 00:17:45,760
in between evas 2 and 3.

454
00:17:48,630 --> 00:17:47,120
when that's complete the crew is going

455
00:17:50,630 --> 00:17:48,640
to go ahead and

456
00:17:54,070 --> 00:17:50,640
do a couple of get-aheads for the next

457
00:17:56,390 --> 00:17:54,080
dva they'll reposition that ball stack

458
00:17:59,190 --> 00:17:56,400
at a different temp stow location

459
00:18:01,270 --> 00:17:59,200
they'll take the foot restraint move it

460
00:18:01,990 --> 00:18:01,280
up to the location that garrett will use

461
00:18:03,350 --> 00:18:02,000
it

462
00:18:05,029 --> 00:18:03,360
to remove the first battery from the

463
00:18:06,950 --> 00:18:05,039

truss on eba 3

464

00:18:08,789 --> 00:18:06,960

and then we have a couple of tool bags

465

00:18:10,230 --> 00:18:08,799

that we took out

466

00:18:11,270 --> 00:18:10,240

on this eva and we're actually going to

467

00:18:13,430 --> 00:18:11,280

leave those

468

00:18:14,870 --> 00:18:13,440

stowed outside in between so they'll

469

00:18:16,390 --> 00:18:14,880

stow those

470

00:18:23,029 --> 00:18:16,400

on the truss also

471

00:18:27,909 --> 00:18:26,230

okay for the third eva

472

00:18:29,669 --> 00:18:27,919

goal is to

473

00:18:32,070 --> 00:18:29,679

finish the r r of the remaining

474

00:18:34,230 --> 00:18:32,080

batteries on the pallet

475

00:18:36,390 --> 00:18:34,240

mike good and garrett riesman will be

476
00:18:37,909 --> 00:18:36,400
going out for this

477
00:18:40,390 --> 00:18:37,919
third eva

478
00:18:42,230 --> 00:18:40,400
with mike taking the lead

479
00:18:44,549 --> 00:18:42,240
we're going to start this eva in the

480
00:18:46,310 --> 00:18:44,559
same arm and pallet configuration that

481
00:18:52,310 --> 00:18:46,320
we did on the last eva we'll go ahead

482
00:18:56,630 --> 00:18:54,470
so again coming into the

483
00:18:58,470 --> 00:18:56,640
same work site

484
00:19:01,190 --> 00:18:58,480
not as much preparation as required on

485
00:19:03,270 --> 00:19:01,200
eba2 since everything's

486
00:19:06,070 --> 00:19:03,280
set up for us

487
00:19:07,990 --> 00:19:06,080
so here you can see

488
00:19:09,510 --> 00:19:08,000

garrett is hanging upside down there

489

00:19:11,190 --> 00:19:09,520

from his foot restraint in what we call

490

00:19:13,590 --> 00:19:11,200

the batman position to remove that first

491

00:19:15,750 --> 00:19:13,600

battery from the truss he'll hand it

492

00:19:18,070 --> 00:19:15,760

down the mic they temp stow it

493

00:19:20,710 --> 00:19:18,080

down there at the bottom

494

00:19:23,350 --> 00:19:20,720

and then they will translate

495

00:19:24,390 --> 00:19:23,360

over to the pallet

496

00:19:26,150 --> 00:19:24,400

again

497

00:19:28,310 --> 00:19:26,160

guide it in

498

00:19:29,750 --> 00:19:28,320

and start the

499

00:19:31,110 --> 00:19:29,760

removal process

500

00:19:33,669 --> 00:19:31,120

over again

501
00:19:37,350 --> 00:19:33,679
so here we have like this time is our

502
00:19:37,360 --> 00:19:42,390
pulling the battery out of the pallet

503
00:19:46,230 --> 00:19:44,710
and then the crew will again shepherd it

504
00:19:48,710 --> 00:19:46,240
down

505
00:19:53,990 --> 00:19:48,720
to the install location

506
00:19:54,000 --> 00:19:57,909
reposition the foot restraint

507
00:20:01,510 --> 00:19:58,950
and then

508
00:20:03,830 --> 00:20:01,520
garrett will ingress the foot restraint

509
00:20:05,110 --> 00:20:03,840
remove the fifth battery from the truss

510
00:20:07,830 --> 00:20:05,120
again shepherd it back over to the

511
00:20:09,909 --> 00:20:07,840
pallet

512
00:20:12,070 --> 00:20:09,919
install it for the return to earth

513
00:20:13,909 --> 00:20:12,080

and here you can see garrett

514

00:20:15,029 --> 00:20:13,919

practicing at the

515

00:20:21,990 --> 00:20:15,039

in the pool

516

00:20:25,990 --> 00:20:24,149

once that battery is complete again

517

00:20:27,990 --> 00:20:26,000

guide the pallet

518

00:20:29,510 --> 00:20:28,000

down to the

519

00:20:39,669 --> 00:20:29,520

position to remove the fifth battery

520

00:20:45,830 --> 00:20:41,270

i'll go ahead and

521

00:20:50,630 --> 00:20:47,909

as you can see it's very slow and

522

00:20:52,470 --> 00:20:50,640

meticulous process

523

00:20:54,149 --> 00:20:52,480

the back side of those batteries has

524

00:20:55,750 --> 00:20:54,159

cooling fins on it so the crew has to be

525

00:20:58,390 --> 00:20:55,760

very careful

526

00:21:03,110 --> 00:20:58,400

not to nick or ding

527

00:21:08,070 --> 00:21:05,350

again pallet backs away

528

00:21:10,230 --> 00:21:08,080

crew will shepherd the battery

529

00:21:12,549 --> 00:21:10,240

down to the install location here you

530

00:21:14,549 --> 00:21:12,559

can see garrett installing the battery

531

00:21:16,950 --> 00:21:14,559

into the truss and then mike again

532

00:21:18,630 --> 00:21:16,960

helping him guide it in there

533

00:21:20,630 --> 00:21:18,640

so it doesn't

534

00:21:22,470 --> 00:21:20,640

hit any of the side walls of the truss

535

00:21:27,270 --> 00:21:22,480

there like i said garrett can't see much

536

00:21:31,510 --> 00:21:28,630

once we're done with the fifth battery

537

00:21:33,350 --> 00:21:31,520

we'll rotate our foot restraint over

538

00:21:36,789 --> 00:21:33,360

to a position that garrett can pull the

539

00:21:43,270 --> 00:21:38,149

again shepherd that back up to the

540

00:21:43,280 --> 00:21:46,630

install it

541

00:21:51,669 --> 00:21:48,470

remove the handling aids

542

00:21:51,679 --> 00:21:55,430

and then again guide the pallet

543

00:22:01,510 --> 00:21:57,750

up to the position that he can pull the

544

00:22:14,870 --> 00:22:03,350

off the pallet for installation into the

545

00:22:18,149 --> 00:22:16,710

we expect these batteries

546

00:22:20,310 --> 00:22:18,159

to take somewhere in the neighborhood of

547

00:22:23,750 --> 00:22:20,320

45 to an hour

548

00:22:26,230 --> 00:22:23,760

for each pair of one from each

549

00:22:27,750 --> 00:22:26,240

one from the pallet one from the truss

550

00:22:29,430 --> 00:22:27,760

again when that six battery is out of

551
00:22:30,710 --> 00:22:29,440
the pallet

552
00:22:31,909 --> 00:22:30,720
garrett will go ahead and install that

553
00:22:33,990 --> 00:22:31,919
into the truss

554
00:22:35,510 --> 00:22:34,000
the crew will then retrieve the temp

555
00:22:38,470 --> 00:22:35,520
stowed battery

556
00:22:41,350 --> 00:22:38,480
shepard that back over to the pallet

557
00:22:43,909 --> 00:22:41,360
install it remove the handling aids for

558
00:22:45,430 --> 00:22:43,919
the final time close up the

559
00:22:47,669 --> 00:22:45,440
thermal cover

560
00:22:49,909 --> 00:22:47,679
and then they'll make sure that

561
00:22:51,350 --> 00:22:49,919
everything's tucked away

562
00:22:52,470 --> 00:22:51,360
for the pallets returned in the shuttle

563
00:22:54,710 --> 00:22:52,480

bay

564

00:22:56,230 --> 00:22:54,720

and that's basically just closing some

565

00:22:58,310 --> 00:22:56,240

quarter turn fasteners making sure all

566

00:22:59,990 --> 00:22:58,320

the coverings are down

567

00:23:02,149 --> 00:23:00,000

and then again the arm will move off to

568

00:23:03,350 --> 00:23:02,159

a clearance position

569

00:23:07,190 --> 00:23:03,360

uh

570

00:23:09,750 --> 00:23:07,200

relocated down the truss so that it can

571

00:23:12,149 --> 00:23:09,760

be put back in the payload bay

572

00:23:14,230 --> 00:23:12,159

at this point the crew is going to

573

00:23:15,669 --> 00:23:14,240

gather up those gap spanner chains that

574

00:23:16,870 --> 00:23:15,679

they installed back at the beginning of

575

00:23:18,230 --> 00:23:16,880

eva2

576

00:23:20,470 --> 00:23:18,240

we're going to grab one of the foot

577

00:23:22,630 --> 00:23:20,480

restraints that we have out there we are

578

00:23:25,430 --> 00:23:22,640

leaving one out for use

579

00:23:27,669 --> 00:23:25,440

on a later shuttle mission

580

00:23:29,430 --> 00:23:27,679

and we will take the

581

00:23:31,430 --> 00:23:29,440

foot restraint the gap spanner chains

582

00:23:33,909 --> 00:23:31,440

and then the two tool bags that we also

583

00:23:35,190 --> 00:23:33,919

had taken out there on eba to

584

00:23:37,190 --> 00:23:35,200

bring everything

585

00:23:39,190 --> 00:23:37,200

back in board

586

00:23:41,029 --> 00:23:39,200

we're going to drop the foot restraint

587

00:23:42,230 --> 00:23:41,039

off

588

00:23:43,990 --> 00:23:42,240

on the

589

00:23:45,430 --> 00:23:44,000

port seat of cart that's one of the

590

00:23:47,190 --> 00:23:45,440

carts attached there to the mobile

591

00:23:48,789 --> 00:23:47,200

transporter

592

00:23:50,870 --> 00:23:48,799

and at this point

593

00:23:52,549 --> 00:23:50,880

if is time remaining

594

00:23:55,029 --> 00:23:52,559

in the eva

595

00:23:57,029 --> 00:23:55,039

we'll go ahead and translate

596

00:23:58,710 --> 00:23:57,039

down to the shuttle

597

00:24:01,430 --> 00:23:58,720

we have a

598

00:24:02,710 --> 00:24:01,440

grapple fixture that we flew up on the

599

00:24:05,669 --> 00:24:02,720

port side

600

00:24:08,149 --> 00:24:05,679

of the shuttle payload bay

601
00:24:09,190 --> 00:24:08,159
so the crew will translate down on their

602
00:24:11,909 --> 00:24:09,200
way

603
00:24:14,310 --> 00:24:11,919
grab a handling aid

604
00:24:15,750 --> 00:24:14,320
that they can install onto the face of

605
00:24:17,669 --> 00:24:15,760
that

606
00:24:19,909 --> 00:24:17,679
grapple fixture

607
00:24:21,830 --> 00:24:19,919
once they have the handling aid

608
00:24:23,110 --> 00:24:21,840
installed

609
00:24:24,390 --> 00:24:23,120
you can see here in the video that's

610
00:24:26,149 --> 00:24:24,400
what they're doing right now is putting

611
00:24:27,669 --> 00:24:26,159
that handling aid on

612
00:24:30,950 --> 00:24:27,679
once that is installed they'll work

613
00:24:32,950 --> 00:24:30,960

together to remove four fasteners

614

00:24:35,350 --> 00:24:32,960

here they are driving

615

00:24:37,110 --> 00:24:35,360

those fasteners to release them

616

00:24:40,950 --> 00:24:37,120

remove the four fasteners that hold the

617

00:24:42,950 --> 00:24:40,960

grapple fixture to the payload bay wall

618

00:24:45,029 --> 00:24:42,960

pull it off

619

00:24:47,029 --> 00:24:45,039

and then

620

00:24:48,710 --> 00:24:47,039

we'll actually use that handling aid

621

00:24:49,909 --> 00:24:48,720

allows us to

622

00:24:51,830 --> 00:24:49,919

stow

623

00:24:54,230 --> 00:24:51,840

that grapple fixture onto

624

00:24:57,110 --> 00:24:54,240

mike good's body restraint tether

625

00:24:58,789 --> 00:24:57,120

on the left side of his spacesuit

626

00:25:00,950 --> 00:24:58,799

they'll then

627

00:25:02,470 --> 00:25:00,960

start the long translation from the

628

00:25:04,230 --> 00:25:02,480

shuttle payload bay back over to the

629

00:25:06,950 --> 00:25:04,240

airlock and we're actually going to take

630

00:25:10,230 --> 00:25:06,960

that grapple fixture back inside

631

00:25:11,830 --> 00:25:10,240

uh where it will be integrated onto some

632

00:25:13,750 --> 00:25:11,840

russian hardware

633

00:25:15,110 --> 00:25:13,760

and the plan is to take

634

00:25:17,029 --> 00:25:15,120

that full assembly with the grapple

635

00:25:19,269 --> 00:25:17,039

fixture and the russian hardware back

636

00:25:22,310 --> 00:25:19,279

out later on a stage eba

637

00:25:24,149 --> 00:25:22,320

front installation onto the fgb so it

638

00:25:27,029 --> 00:25:24,159

would give us a new arm base

639

00:25:30,149 --> 00:25:28,630

and when that is complete the crew is

640

00:25:35,990 --> 00:25:30,159

going to go ahead and come back

641

00:25:40,149 --> 00:25:38,070

that go ahead and concludes the summary

642

00:25:42,950 --> 00:25:40,159

of the eba so if there's any questions

643

00:25:44,230 --> 00:25:42,960

now i can go ahead and take those

644

00:25:45,350 --> 00:25:44,240

okay we'll start off with questions here

645

00:25:50,470 --> 00:25:45,360

at the johnson space center then we'll

646

00:25:52,950 --> 00:25:51,669

nothing here

647

00:25:54,149 --> 00:25:52,960

anybody

648

00:25:55,029 --> 00:25:54,159

sure

649

00:25:56,870 --> 00:25:55,039

um

650

00:25:57,909 --> 00:25:56,880

moving the big batteries right you all

651
00:25:59,830 --> 00:25:57,919
have done stuff like this before is

652
00:26:02,149 --> 00:25:59,840
there anything in your mind especially

653
00:26:03,909 --> 00:26:02,159
challenging about any of these tasks if

654
00:26:05,430 --> 00:26:03,919
being either the the escant you know

655
00:26:07,350 --> 00:26:05,440
clearance issue and making sure you get

656
00:26:09,190 --> 00:26:07,360
it out without dinging something or just

657
00:26:11,190 --> 00:26:09,200
moving these masses around

658
00:26:13,510 --> 00:26:11,200
yeah the challenge i mean especially

659
00:26:14,230 --> 00:26:13,520
with the escant is that the uh

660
00:26:15,750 --> 00:26:14,240
well

661
00:26:17,269 --> 00:26:15,760
one like for the boom i mean like i said

662
00:26:19,350 --> 00:26:17,279
it's eight foot long

663
00:26:21,350 --> 00:26:19,360

so i mean it's just a very large mass

664

00:26:22,870 --> 00:26:21,360

it's not very heavy

665

00:26:24,789 --> 00:26:22,880

but the crew just needs to be careful as

666

00:26:27,190 --> 00:26:24,799

they you know translate it around and we

667

00:26:29,110 --> 00:26:27,200

especially want to make sure we don't

668

00:26:30,950 --> 00:26:29,120

hit any of the other hardware on the

669

00:26:33,590 --> 00:26:30,960

pallet so that's why it's very important

670

00:26:35,830 --> 00:26:33,600

that steve helps garrett lift that boom

671

00:26:37,669 --> 00:26:35,840

up over the gold posts

672

00:26:39,750 --> 00:26:37,679

on the dexter platform

673

00:26:41,750 --> 00:26:39,760

and then when we translate the dish

674

00:26:43,190 --> 00:26:41,760

itself that dish is very fragile that's

675

00:26:45,350 --> 00:26:43,200

a graphite

676

00:26:47,669 --> 00:26:45,360

composite dish

677

00:26:49,269 --> 00:26:47,679

so you can see there on the video it's a

678

00:26:50,710 --> 00:26:49,279

very tight clearance

679

00:26:52,470 --> 00:26:50,720

when garrett goes ahead and pulls that

680

00:26:54,310 --> 00:26:52,480

out so he just needs to be very careful

681

00:26:56,070 --> 00:26:54,320

and then again

682

00:26:57,830 --> 00:26:56,080

when they go to install the dish onto

683

00:26:59,830 --> 00:26:57,840

the boom

684

00:27:01,190 --> 00:26:59,840

we've been told by the engineers

685

00:27:03,350 --> 00:27:01,200

that own that hardware that that's a

686

00:27:04,710 --> 00:27:03,360

very very sensitive interface and any

687

00:27:06,230 --> 00:27:04,720

scratches could

688

00:27:07,990 --> 00:27:06,240

degrade the signal so we need to be

689

00:27:10,230 --> 00:27:08,000

careful with that

690

00:27:11,830 --> 00:27:10,240

as far as the batteries

691

00:27:13,669 --> 00:27:11,840

like i said they are big and kind of

692

00:27:14,710 --> 00:27:13,679

unwieldy you can't see a you know a lot

693

00:27:16,470 --> 00:27:14,720

when you're

694

00:27:17,830 --> 00:27:16,480

actually holding the battery but one of

695

00:27:19,830 --> 00:27:17,840

the biggest challenges on that you can

696

00:27:21,669 --> 00:27:19,840

see it's a very repetitive process you

697

00:27:22,789 --> 00:27:21,679

know so the crew

698

00:27:23,990 --> 00:27:22,799

you know they've trained a lot but they

699

00:27:26,070 --> 00:27:24,000

need to really keep their head in the

700

00:27:27,909 --> 00:27:26,080

game you know to not get

701
00:27:29,430 --> 00:27:27,919
complacent and

702
00:27:30,549 --> 00:27:29,440
make sure they always remember where

703
00:27:33,269 --> 00:27:30,559
they are and

704
00:27:35,269 --> 00:27:33,279
tony antonelli our iv is very very good

705
00:27:37,350 --> 00:27:35,279
at uh keeping everybody you know in the

706
00:27:39,029 --> 00:27:37,360
game and making sure that we're

707
00:27:41,190 --> 00:27:39,039
you know doing what we're supposed to do

708
00:27:43,190 --> 00:27:41,200
and one more for me um i'm given that

709
00:27:44,710 --> 00:27:43,200
you've got three guys doing two each

710
00:27:46,389 --> 00:27:44,720
and everybody's a lead on one is there a

711
00:27:47,750 --> 00:27:46,399
reason for that or is that just

712
00:27:48,870 --> 00:27:47,760
just to spread it spread it around a

713
00:27:50,630 --> 00:27:48,880

little bit i wasn't sure about the

714

00:27:51,909 --> 00:27:50,640

reason um it was really just to spread

715

00:27:53,750 --> 00:27:51,919

it around a little bit i mean it's rare

716

00:27:54,950 --> 00:27:53,760

that you have three veteran spacewalkers

717

00:27:56,710 --> 00:27:54,960

on one mission

718

00:27:58,389 --> 00:27:56,720

um so they each bring something

719

00:28:01,430 --> 00:27:58,399

different to the table you know steve

720

00:28:03,110 --> 00:28:01,440

has done the assembly missions before

721

00:28:04,870 --> 00:28:03,120

mike has done the hubble missions and

722

00:28:06,070 --> 00:28:04,880

garrett actually lived onboard space

723

00:28:07,190 --> 00:28:06,080

station so they each bring something

724

00:28:08,389 --> 00:28:07,200

different so

725

00:28:11,669 --> 00:28:08,399

we only thought it was fair that they

726

00:28:13,269 --> 00:28:11,679

each get to take the lead on an eva

727

00:28:14,630 --> 00:28:13,279

okay that's it from here let's go down

728

00:28:18,549 --> 00:28:14,640

to the kennedy space center in florida

729

00:28:23,430 --> 00:28:21,029

marcia dunn associated press

730

00:28:25,029 --> 00:28:23,440

for the battery work some of that prep

731

00:28:27,029 --> 00:28:25,039

work i know was taken off the last

732

00:28:29,350 --> 00:28:27,039

flight due to some safety concerns and

733

00:28:32,710 --> 00:28:29,360

i'm wondering what changes were made

734

00:28:36,389 --> 00:28:32,720

to make it safe for the upcoming

735

00:28:37,909 --> 00:28:36,399

spacewalks that's a very good question

736

00:28:40,470 --> 00:28:37,919

yes the

737

00:28:42,830 --> 00:28:40,480

originally the relocation of the

738

00:28:45,269 --> 00:28:42,840

portable foot restraints in the gap

739

00:28:48,230 --> 00:28:45,279

spanners along with the breaking of the

740

00:28:50,070 --> 00:28:48,240

torque on the six batteries on the truss

741

00:28:51,830 --> 00:28:50,080

was to take place by the

742

00:28:54,630 --> 00:28:51,840

last shuttle flight

743

00:28:57,590 --> 00:28:56,310

the reason they decided not to do that

744

00:28:59,510 --> 00:28:57,600

was because of

745

00:29:01,590 --> 00:28:59,520

an uncertainty

746

00:29:02,710 --> 00:29:01,600

with an electrical shock hazard that we

747

00:29:05,269 --> 00:29:02,720

had

748

00:29:07,750 --> 00:29:05,279

and so we are flying up

749

00:29:09,830 --> 00:29:07,760

new mini workstations which is the

750

00:29:11,430 --> 00:29:09,840

piece of hardware that the crew wears on

751
00:29:13,029 --> 00:29:11,440
the front of the spacesuits that holds

752
00:29:14,149 --> 00:29:13,039
the tools

753
00:29:15,909 --> 00:29:14,159
for them

754
00:29:18,710 --> 00:29:15,919
those new base plates

755
00:29:20,070 --> 00:29:18,720
are electrically isolated from the suits

756
00:29:21,830 --> 00:29:20,080
and

757
00:29:23,750 --> 00:29:21,840
that will reduce the

758
00:29:25,909 --> 00:29:23,760
hazard back into an acceptable range

759
00:29:29,430 --> 00:29:25,919
when our crew performs the uh that

760
00:29:33,669 --> 00:29:30,710
will they be taking any other

761
00:29:36,310 --> 00:29:33,679
precautions aside from that to

762
00:29:38,549 --> 00:29:36,320
further reduce the risk or is that

763
00:29:42,070 --> 00:29:38,559

enough in terms of the

764

00:29:44,549 --> 00:29:42,080

safety concerns we had we had other

765

00:29:48,389 --> 00:29:44,559

mitigation

766

00:29:50,470 --> 00:29:48,399

that's to always make sure that their

767

00:29:52,630 --> 00:29:50,480

their wrist rings are covered by their

768

00:29:54,389 --> 00:29:52,640

gauntlets

769

00:29:55,350 --> 00:29:54,399

other than that we we don't have any

770

00:29:59,669 --> 00:29:55,360

other

771

00:30:03,830 --> 00:30:01,750

and and lastly for the last question

772

00:30:05,750 --> 00:30:03,840

from here how many um

773

00:30:08,389 --> 00:30:05,760

how what is the distance between that

774

00:30:10,470 --> 00:30:08,399

work site on the far port side and the

775

00:30:12,389 --> 00:30:10,480

airlock in terms of the distance

776

00:30:14,789 --> 00:30:12,399

traveled by the crew not you know as the

777

00:30:16,950 --> 00:30:14,799

bird fly so to speak but from

778

00:30:18,630 --> 00:30:16,960

hand over hand crawling how many feet is

779

00:30:19,590 --> 00:30:18,640

that do you know offhand

780

00:30:21,190 --> 00:30:19,600

um

781

00:30:24,310 --> 00:30:21,200

i don't let me see i don't i don't know

782

00:30:25,750 --> 00:30:24,320

exactly off hand but i know we're

783

00:30:27,909 --> 00:30:25,760

almost towards the end of our tethers

784

00:30:29,909 --> 00:30:27,919

we're using an 85 foot safety tether to

785

00:30:31,590 --> 00:30:29,919

get out

786

00:30:33,269 --> 00:30:31,600

to an anchor point where we're we're

787

00:30:35,269 --> 00:30:33,279

dropping the anchors of those tethers

788

00:30:37,350 --> 00:30:35,279

off and then we

789

00:30:38,909 --> 00:30:37,360

go another 85 feet

790

00:30:41,830 --> 00:30:38,919

from there so it's at

791

00:30:44,470 --> 00:30:41,840

170 feet and then we have a 55 foot

792

00:30:46,230 --> 00:30:44,480

tether connected to our 85 foot tethers

793

00:30:48,549 --> 00:30:46,240

so that would be some place in the

794

00:30:51,430 --> 00:30:48,559

neighborhood of 220 feet that the crew

795

00:30:54,549 --> 00:30:51,440

is translating

796

00:30:56,950 --> 00:30:55,830

okay i think that's it from the kennedy

797

00:31:02,310 --> 00:30:56,960

space center let's go to nasa

798

00:31:07,350 --> 00:31:04,310

thank you it's uh tarek malek from

799

00:31:08,789 --> 00:31:07,360

space.com and uh you know i it seemed

800

00:31:10,470 --> 00:31:08,799

you mentioned the the repetitive nature

801
00:31:13,269 --> 00:31:10,480
of the battery working and that it's

802
00:31:15,669 --> 00:31:13,279
going to take a couple spacewalks to um

803
00:31:18,470 --> 00:31:15,679
to complete i'm just wondering how um

804
00:31:21,029 --> 00:31:18,480
how you do keep them focused on what it

805
00:31:23,669 --> 00:31:21,039
what looks to be a pretty tedious

806
00:31:25,830 --> 00:31:23,679
task at the end of the space station and

807
00:31:27,830 --> 00:31:25,840
i guess how many runs that they do each

808
00:31:29,909 --> 00:31:27,840
of the spacewalkers perform

809
00:31:32,230 --> 00:31:29,919
to rehearse those those

810
00:31:33,509 --> 00:31:32,240
actions thanks

811
00:31:35,750 --> 00:31:33,519
good question

812
00:31:37,350 --> 00:31:35,760
uh we actually as far as timeline runs

813
00:31:39,110 --> 00:31:37,360

for the batteries

814

00:31:40,789 --> 00:31:39,120

we did six

815

00:31:42,549 --> 00:31:40,799

runs in the water there was actually an

816

00:31:44,230 --> 00:31:42,559

another few

817

00:31:45,509 --> 00:31:44,240

runs that we did just for development to

818

00:31:47,509 --> 00:31:45,519

make sure we

819

00:31:50,630 --> 00:31:47,519

we had a good technique for training the

820

00:31:55,110 --> 00:31:52,630

as far as keeping the crew on game i

821

00:31:56,870 --> 00:31:55,120

mean when you're holding a big 365 pound

822

00:31:57,830 --> 00:31:56,880

battery i think they're they're very

823

00:32:00,630 --> 00:31:57,840

aware

824

00:32:02,710 --> 00:32:00,640

um how important it is um to stay with

825

00:32:04,950 --> 00:32:02,720

it but like i said our our iv tony

826

00:32:07,990 --> 00:32:04,960

antonelli um he really

827

00:32:11,110 --> 00:32:08,000

you know um keeps the crews the crew

828

00:32:12,470 --> 00:32:11,120

talking he makes sure makes sure that uh

829

00:32:14,389 --> 00:32:12,480

you know that

830

00:32:16,789 --> 00:32:14,399

that the guy on the pallet is

831

00:32:18,789 --> 00:32:16,799

communicating clearly to piers

832

00:32:19,750 --> 00:32:18,799

operating it from the arm so

833

00:32:21,110 --> 00:32:19,760

um

834

00:32:24,149 --> 00:32:21,120

we haven't

835

00:32:26,230 --> 00:32:24,159

and executed this but i don't think the

836

00:32:29,830 --> 00:32:26,240

crew is going to have any problems

837

00:32:31,029 --> 00:32:29,840

keeping their head in the game

838

00:32:32,710 --> 00:32:31,039

i think that's it from headquarters

839

00:32:37,830 --> 00:32:32,720

let's come back here for some follow-ups

840

00:32:41,269 --> 00:32:39,190

yeah just have a quick one uh mark

841

00:32:42,789 --> 00:32:41,279

kirkman inner space news can you tell me

842

00:32:45,190 --> 00:32:42,799

where you stand on eva training at this

843

00:32:48,070 --> 00:32:45,200

point are any more nbl runs uh vr lab

844

00:32:50,789 --> 00:32:48,080

runs or sims left nope at this point

845

00:32:52,310 --> 00:32:50,799

we've completed all of the mbl runs and

846

00:32:53,750 --> 00:32:52,320

it's a good point we did because this

847

00:32:55,669 --> 00:32:53,760

was so hard to train in the pool we

848

00:32:57,750 --> 00:32:55,679

pretty much coupled every

849

00:32:59,430 --> 00:32:57,760

pool run with a run in the virtual

850

00:33:01,029 --> 00:32:59,440

reality lab so

851
00:33:04,070 --> 00:33:01,039
but at this point everything is complete

852
00:33:05,509 --> 00:33:04,080
the crew's fully trained and ready to go

853
00:33:07,750 --> 00:33:05,519
okay bill

854
00:33:09,029 --> 00:33:07,760
yeah just one more follow-up on marsha's

855
00:33:10,470 --> 00:33:09,039
question about the shock hazard i was

856
00:33:12,950 --> 00:33:10,480
never clear when they told us about this

857
00:33:14,310 --> 00:33:12,960
last time was this an issue that your

858
00:33:16,149 --> 00:33:14,320
suit takes a charge and you have a

859
00:33:17,669 --> 00:33:16,159
malfunction or does this kill somebody i

860
00:33:19,269 --> 00:33:17,679
mean i never really understood the real

861
00:33:20,789 --> 00:33:19,279
nature of the threat

862
00:33:22,149 --> 00:33:20,799
um

863
00:33:24,389 --> 00:33:22,159

i'm probably not the best person to

864

00:33:26,310 --> 00:33:24,399

answer that but in my understanding is

865

00:33:29,430 --> 00:33:26,320

it's not something that's going to kill

866

00:33:31,590 --> 00:33:29,440

somebody but it could cause you to

867

00:33:34,230 --> 00:33:31,600

involuntarily move

868

00:33:35,590 --> 00:33:34,240

maybe cause somebody to drop a battery

869

00:33:39,110 --> 00:33:35,600

lose their grip

870

00:33:41,029 --> 00:33:39,120

on the trust something like that

871

00:33:42,549 --> 00:33:41,039

okay is that it from here

872

00:33:44,549 --> 00:33:42,559

all right we'll wrap up today's briefing

873

00:33:46,710 --> 00:33:44,559

coming up next here on nasa television

874

00:33:47,990 --> 00:33:46,720

we'll have the bureau video file you'll

875

00:33:48,870 --> 00:33:48,000

see all the animations and some of the

876

00:33:50,389 --> 00:33:48,880

video

877

00:33:52,230 --> 00:33:50,399

that you've been seeing during today's

878

00:33:55,029 --> 00:33:52,240

briefings our next briefing from here at

879

00:33:58,070 --> 00:33:55,039

jsc will take place at 1 pm central time

880

00:33:59,990 --> 00:33:58,080

2 pm eastern time the entire sts-132

881

00:34:01,909 --> 00:34:00,000

crew will be here to answer questions

882

00:34:03,590 --> 00:34:01,919

about their upcoming flight

883

00:34:06,830 --> 00:34:03,600

as always for the latest information you