

# SPACEWALKERS



**Mike Fincke**  
Mission Specialist



**Greg Chamitoff**  
Mission Specialist

1  
00:00:06,550 --> 00:00:03,869  
good day and welcome back to today's

2  
00:00:08,950 --> 00:00:06,560  
sts-134 utilization flights six

3  
00:00:11,350 --> 00:00:08,960  
briefings this is the mission overview

4  
00:00:13,030 --> 00:00:11,360  
briefing featuring Gary Locker

5  
00:00:15,100 --> 00:00:13,040  
who's the lead for the space shuttle

6  
00:00:17,050 --> 00:00:15,110  
portion of the mission and eric hoffman

7  
00:00:19,300 --> 00:00:17,060  
who's a lead for the space station

8  
00:00:20,740 --> 00:00:19,310  
control team for this flight and we'll

9  
00:00:22,269 --> 00:00:20,750  
start out with their opening statements

10  
00:00:24,279 --> 00:00:22,279  
and then move on to your questions Gary

11  
00:00:25,570 --> 00:00:24,289  
Thank You Kelly well good morning

12  
00:00:28,060 --> 00:00:25,580  
everybody it's great to see y'all here

13  
00:00:29,589 --> 00:00:28,070

today I really appreciate you taking

14

00:00:32,290 --> 00:00:29,599

some time to come here some of the

15

00:00:36,340 --> 00:00:32,300

details of the final voyage of space

16

00:00:39,220 --> 00:00:36,350

shuttle Endeavour sts-134 you left six

17

00:00:42,370 --> 00:00:39,230

will be the 134th mission for the space

18

00:00:43,660 --> 00:00:42,380

shuttle program be the 35th shuttle

19

00:00:45,850 --> 00:00:43,670

flight to the International Space

20

00:00:48,670 --> 00:00:45,860

Station and will be the twenty fifth and

21

00:00:51,070 --> 00:00:48,680

final flight of endeavor we've got an

22

00:00:52,480 --> 00:00:51,080

exciting mission planned out so let me

23

00:00:56,620 --> 00:00:52,490

go ahead and introduce the crew to you

24

00:00:58,030 --> 00:00:56,630

and you get the group photo up please so

25

00:01:00,970 --> 00:00:58,040

we'll start in the center bottom there

26  
00:01:03,190 --> 00:01:00,980  
you'll see our commander Mark Kelly he

27  
00:01:06,400 --> 00:01:03,200  
is a veteran space flier of three

28  
00:01:09,940 --> 00:01:06,410  
previous shuttle flights sts 10 8 121

29  
00:01:11,590 --> 00:01:09,950  
and 124 music kept in the US Navy and

30  
00:01:14,650 --> 00:01:11,600  
this will be as a second flight on

31  
00:01:16,480 --> 00:01:14,660  
endeavour move to left side of the

32  
00:01:18,820 --> 00:01:16,490  
picture there will start on left and

33  
00:01:21,490 --> 00:01:18,830  
move to the right we've got our pilot

34  
00:01:23,980 --> 00:01:21,500  
Greg Johnson he's a colonel in the US

35  
00:01:27,010 --> 00:01:23,990  
Air Force and he has flown once before

36  
00:01:29,290 --> 00:01:27,020  
and SGS 123 that was also on endeavour

37  
00:01:31,780 --> 00:01:29,300  
and Greg will also be one of our lead

38  
00:01:36,160 --> 00:01:31,790

robotics crew members on board when we

39

00:01:38,550 --> 00:01:36,170

get to orbit next to Greg is Mike Fink

40

00:01:41,290 --> 00:01:38,560

he is also colonel in the US Air Force

41

00:01:43,030 --> 00:01:41,300

he's a veteran flyer of two expedition

42

00:01:44,980 --> 00:01:43,040

missions to the International Space

43

00:01:46,980 --> 00:01:44,990

Station expedition 9 as well as

44

00:01:49,600 --> 00:01:46,990

expedition 18 where he was a commander

45

00:01:51,250 --> 00:01:49,610

this however will be his first flight on

46

00:01:54,550 --> 00:01:51,260

the shuttle both of his expedition

47

00:01:58,060 --> 00:01:54,560

flights were on Soyuz vehicles next to

48

00:02:01,120 --> 00:01:58,070

mike is Greg chamot off ms 2 he also

49

00:02:04,469 --> 00:02:01,130

spent long-duration mission on the space

50

00:02:07,360 --> 00:02:04,479

station with expedition 17 and 18 and

51  
00:02:09,790 --> 00:02:07,370  
his ride tune from the space station for

52  
00:02:10,749 --> 00:02:09,800  
that mission was on board the shuttles

53  
00:02:13,390 --> 00:02:10,759  
as well but this will be his first

54  
00:02:19,140 --> 00:02:13,400  
shuttle full shuttle flight on

55  
00:02:24,100 --> 00:02:19,150  
never next to him is drew Feustel ms3 he

56  
00:02:27,429 --> 00:02:24,110  
was last at the Hubble servicing mission

57  
00:02:29,199 --> 00:02:27,439  
on sts-125 doing numerous spacewalks and

58  
00:02:32,289 --> 00:02:29,209  
it would be one of our lead spacewalkers

59  
00:02:34,630 --> 00:02:32,299  
for this flight and on the far right

60  
00:02:36,759 --> 00:02:34,640  
there is Roberto Vittori he's our

61  
00:02:39,819 --> 00:02:36,769  
European Space Agency astronaut on this

62  
00:02:41,920 --> 00:02:39,829  
mission and he did too so use taxi

63  
00:02:46,240 --> 00:02:41,930

rotations to the space station one back

64

00:02:47,800 --> 00:02:46,250

in 2002 and another in 2005 and this

65

00:02:51,580 --> 00:02:47,810

will be his first flight on the on the

66

00:02:55,360 --> 00:02:51,590

shuttle so if we can go on to the crew

67

00:02:57,069 --> 00:02:55,370

patch I'm going to tell you the

68

00:02:59,140 --> 00:02:57,079

description of the patch here is the

69

00:03:00,339 --> 00:02:59,150

design of the 134 crew patch highlights

70

00:03:02,890 --> 00:03:00,349

research on the International Space

71

00:03:04,750 --> 00:03:02,900

Station focusing on fundamental physics

72

00:03:06,610 --> 00:03:04,760

of the universe on this mission the crew

73

00:03:07,839 --> 00:03:06,620

of the space shuttle endeavour will

74

00:03:10,660 --> 00:03:07,849

install the Alpha Magnetic Spectrometer

75

00:03:14,110 --> 00:03:10,670

the MS experiment which is a cosmic

76  
00:03:15,729 --> 00:03:14,120  
particle detector but studying subatomic

77  
00:03:18,159 --> 00:03:15,739  
particles in the background cosmic

78  
00:03:19,720 --> 00:03:18,169  
radiation and searching for antimatter

79  
00:03:21,250 --> 00:03:19,730  
and dark matter will help scientists

80  
00:03:23,860 --> 00:03:21,260  
better understand the evolution

81  
00:03:24,970 --> 00:03:23,870  
properties of our universe the shape of

82  
00:03:27,250 --> 00:03:24,980  
the patch is inspired by the

83  
00:03:29,680 --> 00:03:27,260  
international atomic symbol representing

84  
00:03:31,539 --> 00:03:29,690  
an atom with the orbiting electrons

85  
00:03:33,430 --> 00:03:31,549  
around the nucleus and the burst in the

86  
00:03:37,000 --> 00:03:33,440  
Senate refers to the big bang theory and

87  
00:03:38,530 --> 00:03:37,010  
the origin of the universe space shuttle

88  
00:03:39,759 --> 00:03:38,540

endeavour and ISS fly together in the

89

00:03:41,110 --> 00:03:39,769

sunrise over the limb of the earth

90

00:03:42,670 --> 00:03:41,120

representing the dawn of a new age

91

00:03:45,369 --> 00:03:42,680

understanding of the nature of the

92

00:03:48,339 --> 00:03:45,379

universe so I think it's a very

93

00:03:50,229 --> 00:03:48,349

representative patch for the for the

94

00:03:52,990 --> 00:03:50,239

compliment we have executing on this

95

00:03:54,399 --> 00:03:53,000

flight next I like to introduce you to

96

00:03:56,229 --> 00:03:54,409

the space shuttle flight directors that

97

00:03:58,770 --> 00:03:56,239

will be supporting the mission if we can

98

00:04:01,119 --> 00:03:58,780

get the sm photo up there Richard

99

00:04:03,420 --> 00:04:01,129

Richard Jones will be RS and flight

100

00:04:06,189 --> 00:04:03,430

director he's a veteran flight director

101  
00:04:08,349 --> 00:04:06,199  
as many assets and entries under his

102  
00:04:10,360 --> 00:04:08,359  
belt and you'll also be serving as the

103  
00:04:11,680 --> 00:04:10,370  
shuttle team for flight director if any

104  
00:04:14,229 --> 00:04:11,690  
issues come up during the mission that

105  
00:04:17,289 --> 00:04:14,239  
we need extra support on he'll lead that

106  
00:04:19,240 --> 00:04:17,299  
team as well I will be the orbit one

107  
00:04:20,589 --> 00:04:19,250  
flight director I'll be working with the

108  
00:04:21,849 --> 00:04:20,599  
crew from the time they wake up in the

109  
00:04:24,399 --> 00:04:21,859  
morning till about halfway through their

110  
00:04:25,930 --> 00:04:24,409  
workday and then I will hand over to the

111  
00:04:27,510 --> 00:04:25,940  
orbit two flight director you see a

112  
00:04:30,820 --> 00:04:27,520  
picture of paul died here

113  
00:04:32,080 --> 00:04:30,830

is a by the most senior flight director

114

00:04:35,110 --> 00:04:32,090

in our office you've seen it many many

115

00:04:37,210 --> 00:04:35,120

times both as a lead and as an orbit

116

00:04:40,240 --> 00:04:37,220

flight director and he's also a space

117

00:04:41,950 --> 00:04:40,250

station flight director as well and he

118

00:04:43,990 --> 00:04:41,960

will be working from middle there crew

119

00:04:46,660 --> 00:04:44,000

work day right up to the time they're

120

00:04:49,300 --> 00:04:46,670

going to sleep at night then he will

121

00:04:51,280 --> 00:04:49,310

hand over to the orbit 3 planning flight

122

00:04:53,860 --> 00:04:51,290

director that'll be Kwazii a laburar ooh

123

00:04:55,930 --> 00:04:53,870

ho and quad sees a another veteran

124

00:04:57,910 --> 00:04:55,940

flight director he's certified both

125

00:05:00,430 --> 00:04:57,920

station flight director side as well as

126

00:05:02,110 --> 00:05:00,440

shuttle and he will be taking care of

127

00:05:04,660 --> 00:05:02,120

Endeavour while the crew sleeps at night

128

00:05:06,460 --> 00:05:04,670

and also replanting the activities for

129

00:05:09,760 --> 00:05:06,470

the next day if any adjustments need to

130

00:05:11,100 --> 00:05:09,770

be made he will also be the lead flight

131

00:05:13,360 --> 00:05:11,110

director on the on the next mission

132

00:05:16,870 --> 00:05:13,370

sts-135 so you'll see him again very

133

00:05:18,910 --> 00:05:16,880

shortly and near the end of mission will

134

00:05:21,880 --> 00:05:18,920

be bringing Tony ciccotti and his team

135

00:05:23,650 --> 00:05:21,890

entry team on to replace my team orbit

136

00:05:25,990 --> 00:05:23,660

one team they'll come in and take care

137

00:05:27,340 --> 00:05:26,000

of standard landing minus one day

138

00:05:29,940 --> 00:05:27,350

activities to make sure the flight

139

00:05:32,350 --> 00:05:29,950

control system and all the landing

140

00:05:34,180 --> 00:05:32,360

subsystems on the orbiter ready to bring

141

00:05:36,820 --> 00:05:34,190

endeavour home and then they'll come in

142

00:05:38,560 --> 00:05:36,830

and go ahead and land endeavour

143

00:05:49,980 --> 00:05:38,570

hopefully beautiful landing right at KSC

144

00:05:52,240 --> 00:05:49,990

right on time so sts-135 Ulf 6 Ulf is

145

00:05:54,550 --> 00:05:52,250

utilities and logistics flight to the

146

00:05:57,390 --> 00:05:54,560

space station the Assembly of the space

147

00:06:00,370 --> 00:05:57,400

station is for all practical purposes

148

00:06:02,980 --> 00:06:00,380

complete so we will be hauling up quite

149

00:06:05,230 --> 00:06:02,990

a bit of cargo to very large payloads to

150

00:06:07,950 --> 00:06:05,240

be installed on the station as well as a

151  
00:06:11,830 --> 00:06:07,960  
bunch of cargo to be transferred inside

152  
00:06:14,470 --> 00:06:11,840  
this is a 14 + 1 + 2 day mission which

153  
00:06:16,960 --> 00:06:14,480  
means we a 14 nominal days planned we

154  
00:06:19,090 --> 00:06:16,970  
also have the consumables available to

155  
00:06:21,340 --> 00:06:19,100  
to add an extra dock date of the mission

156  
00:06:23,020 --> 00:06:21,350  
if if the need arises and then the plus

157  
00:06:25,210 --> 00:06:23,030  
2 days at the end gives us some

158  
00:06:28,120 --> 00:06:25,220  
opportunities to bring endeavour home

159  
00:06:32,110 --> 00:06:28,130  
safely hopefully at KSC usually talking

160  
00:06:35,160 --> 00:06:32,120  
about weather challenges there we also

161  
00:06:37,390 --> 00:06:35,170  
have four spacewalks planned to very

162  
00:06:39,910 --> 00:06:37,400  
large payloads that will be installed

163  
00:06:41,110 --> 00:06:39,920

robotically on this mission then we also

164

00:06:42,280 --> 00:06:41,120

have a unique test

165

00:06:44,710 --> 00:06:42,290

objective that we're going to fly this

166

00:06:46,360 --> 00:06:44,720

flight and that's going to be for the

167

00:06:48,490 --> 00:06:46,370

Orion program so I'd like to take a few

168

00:06:52,780 --> 00:06:48,500

minutes to introduce you to some of that

169

00:06:56,620 --> 00:06:52,790

hardware this test is going to be called

170

00:06:58,330 --> 00:06:56,630

the sensor test for Orion realm nav risk

171

00:06:59,800 --> 00:06:58,340

mitigation I know that's a mouthful so

172

00:07:02,170 --> 00:06:59,810

we're in a download really quick to a

173

00:07:07,240 --> 00:07:02,180

NASA acronym which we all love and

174

00:07:09,790 --> 00:07:07,250

that's storm st orrm and the system is

175

00:07:14,050 --> 00:07:09,800

it basically a visual navigation system

176

00:07:16,150 --> 00:07:14,060

and it will be used for uncrewed and or

177

00:07:19,210 --> 00:07:16,160

crude dockings and undocking for future

178

00:07:20,860 --> 00:07:19,220

spacecraft and the tests were in a

179

00:07:22,060 --> 00:07:20,870

perform on this flight will both

180

00:07:24,879 --> 00:07:22,070

demonstrate and characterize the

181

00:07:26,770 --> 00:07:24,889

performance of this system in the actual

182

00:07:29,469 --> 00:07:26,780

space flight environment that it's going

183

00:07:32,680 --> 00:07:29,479

to be expected to perform in and that's

184

00:07:33,969 --> 00:07:32,690

important because all spaceflight

185

00:07:36,430 --> 00:07:33,979

hardware gets designed on the ground

186

00:07:38,890 --> 00:07:36,440

tested the best we can but you really

187

00:07:40,750 --> 00:07:38,900

can't simulate the entire space

188

00:07:43,150 --> 00:07:40,760

environment here so until you get it to

189

00:07:45,460 --> 00:07:43,160

orbit there's only so far you can take

190

00:07:47,589 --> 00:07:45,470

it and technology goes through what's

191

00:07:49,540 --> 00:07:47,599

called technology readiness levels and

192

00:07:51,070 --> 00:07:49,550

so you get through a certain stage here

193

00:07:52,990 --> 00:07:51,080

on ground testing go as far as you can

194

00:07:54,790 --> 00:07:53,000

go and you can't you can't increase the

195

00:07:56,379 --> 00:07:54,800

readiness level the hardware until you

196

00:07:59,170 --> 00:07:56,389

get it into the actual environment which

197

00:08:01,060 --> 00:07:59,180

is up in space so this is really

198

00:08:02,710 --> 00:08:01,070

exciting to get this Hardware up up in

199

00:08:04,060 --> 00:08:02,720

space give a Ryan a chance to check it

200

00:08:06,250 --> 00:08:04,070

out before they're actually going to be

201  
00:08:10,450 --> 00:08:06,260  
depending on that to do a rendezvous and

202  
00:08:12,250 --> 00:08:10,460  
docking so if I get the first still

203  
00:08:14,620 --> 00:08:12,260  
photo here and start explaining some of

204  
00:08:17,469 --> 00:08:14,630  
the hardware to you you see the sensor

205  
00:08:18,460 --> 00:08:17,479  
enclosure assembly this is installing

206  
00:08:19,839 --> 00:08:18,470  
the payload bay and i'm going to show

207  
00:08:22,450 --> 00:08:19,849  
you the actual locations in just a

208  
00:08:25,810 --> 00:08:22,460  
minute but it contains the two sensors

209  
00:08:27,610 --> 00:08:25,820  
that the storm system is comprised of

210  
00:08:30,640 --> 00:08:27,620  
the first being the vision navigation

211  
00:08:32,949 --> 00:08:30,650  
sensor and this is basically a lighter

212  
00:08:34,990 --> 00:08:32,959  
based system which means a light

213  
00:08:37,180 --> 00:08:35,000

detection and ranging it's it's an

214

00:08:38,949 --> 00:08:37,190

optical sensing technology and it

215

00:08:42,459 --> 00:08:38,959

measures a properties of reflected light

216

00:08:44,110 --> 00:08:42,469

to determine target information it's

217

00:08:46,780 --> 00:08:44,120

similar to standard radar except it uses

218

00:08:50,560 --> 00:08:46,790

laser laser pulses instead of radio

219

00:08:52,360 --> 00:08:50,570

waves the vns acquires a complete

220

00:08:54,650 --> 00:08:52,370

three-dimensional image of the target

221

00:08:58,309 --> 00:08:54,660

and a single laser pulse

222

00:09:01,009 --> 00:08:58,319

one of the most impressive specs in my /

223

00:09:03,559 --> 00:09:01,019

in my opinion is the acquisition range

224

00:09:05,900 --> 00:09:03,569

is about 20,000 feet or six kilometers

225

00:09:07,970 --> 00:09:05,910

this is about three times the capability

226  
00:09:09,710 --> 00:09:07,980  
of the shuttle trajectory control sensor

227  
00:09:13,009 --> 00:09:09,720  
that we use in close flying with the

228  
00:09:14,900 --> 00:09:13,019  
orbiter the other sensor inside that

229  
00:09:16,910 --> 00:09:14,910  
same enclosure is the docking camera

230  
00:09:20,150 --> 00:09:16,920  
this is a high-resolution visual camera

231  
00:09:22,550 --> 00:09:20,160  
that a a crew member could use for both

232  
00:09:25,309 --> 00:09:22,560  
situation is citral situational

233  
00:09:28,160 --> 00:09:25,319  
awareness as well as pi lighting cues if

234  
00:09:29,720 --> 00:09:28,170  
he is manually flying the ship and for

235  
00:09:31,790 --> 00:09:29,730  
comparison on this hardware it's about

236  
00:09:33,470 --> 00:09:31,800  
16 times a higher resolution than the

237  
00:09:38,119 --> 00:09:33,480  
shuttle centerline camera that we use

238  
00:09:42,379 --> 00:09:38,129

today and go to the next still picture

239

00:09:44,449 --> 00:09:42,389

of the avionics box this is also mount

240

00:09:46,069 --> 00:09:44,459

in the payload bay and it provides

241

00:09:48,790 --> 00:09:46,079

basically power distribution both for

242

00:09:51,920 --> 00:09:48,800

the sensors and the avionics box itself

243

00:09:52,850 --> 00:09:51,930

it takes care of the data recording the

244

00:09:54,800 --> 00:09:52,860

sensors are going to collect a

245

00:09:56,689 --> 00:09:54,810

tremendous amount of information so it

246

00:09:59,900 --> 00:09:56,699

will record and store that data inside

247

00:10:02,090 --> 00:09:59,910

this enclosure as well and it's also the

248

00:10:03,920 --> 00:10:02,100

interface between the laptop there's a

249

00:10:06,860 --> 00:10:03,930

dedicated storm laptop that will be in

250

00:10:08,740 --> 00:10:06,870

the crew cabin and drew is going to be

251  
00:10:11,210 --> 00:10:08,750  
our prime crew member operating that

252  
00:10:13,759 --> 00:10:11,220  
laptop and the storm system for us so

253  
00:10:16,400 --> 00:10:13,769  
who activate it and get all set up for

254  
00:10:17,929 --> 00:10:16,410  
the activities and then he'll be there

255  
00:10:19,879 --> 00:10:17,939  
to monitor and help us troubleshoot if

256  
00:10:25,550 --> 00:10:19,889  
anything anything were to crop up they

257  
00:10:29,300 --> 00:10:25,560  
need some attention and then next next

258  
00:10:30,889 --> 00:10:29,310  
slide here you'll see the another key

259  
00:10:32,720 --> 00:10:30,899  
component of the system of the storm

260  
00:10:35,840 --> 00:10:32,730  
reflectors on the right side you got a

261  
00:10:37,519 --> 00:10:35,850  
picture of the docking mechanism on the

262  
00:10:39,650 --> 00:10:37,529  
space station that the shuttle docks to

263  
00:10:42,920 --> 00:10:39,660

and circled in red there is the actual

264

00:10:44,689 --> 00:10:42,930

docking target and a bigger picture that

265

00:10:46,850 --> 00:10:44,699

there is on the left side and you can

266

00:10:50,269 --> 00:10:46,860

see on the outside perimeter the docking

267

00:10:53,869 --> 00:10:50,279

target circled for of the reflectors

268

00:10:57,110 --> 00:10:53,879

that are mounted there specifically for

269

00:10:58,460 --> 00:10:57,120

the storm dto and in the center this

270

00:10:59,780 --> 00:10:58,470

picture doesn't show the crosshair

271

00:11:01,579 --> 00:10:59,790

that's normally mounted there for the

272

00:11:03,319 --> 00:11:01,589

actual docking and on that on that

273

00:11:04,759 --> 00:11:03,329

crosshair will be the fifth element as

274

00:11:07,069 --> 00:11:04,769

well so they'll be five reflectors

275

00:11:08,060 --> 00:11:07,079

installed on the docking target for the

276

00:11:10,370 --> 00:11:08,070

storm system

277

00:11:15,530 --> 00:11:10,380

the to utilize for the approach and

278

00:11:20,120 --> 00:11:15,540

docking and undocking so I'm going to go

279

00:11:21,920 --> 00:11:20,130

to last slide on storm here so as I said

280

00:11:24,410 --> 00:11:21,930

before the the vns system is going to

281

00:11:27,380 --> 00:11:24,420

acquire a 3d image of the target and a

282

00:11:29,380 --> 00:11:27,390

single laser pulse and this reflected

283

00:11:31,400 --> 00:11:29,390

pulse allows for a range or distance

284

00:11:34,910 --> 00:11:31,410

determination and intensity of the

285

00:11:36,320 --> 00:11:34,920

return signal to be determined so many

286

00:11:38,270 --> 00:11:36,330

pulses over time allows you also

287

00:11:42,470 --> 00:11:38,280

determine range rate or relative

288

00:11:44,570 --> 00:11:42,480

velocity between the two spacecraft the

289

00:11:46,250 --> 00:11:44,580

pattern of reflectors in the image

290

00:11:48,350 --> 00:11:46,260

allow for the determination of relative

291

00:11:49,610 --> 00:11:48,360

vehicle orientation so if you look down

292

00:11:52,940 --> 00:11:49,620

at the bottom there on the left you see

293

00:11:54,890 --> 00:11:52,950

a visible image of a docking target

294

00:11:57,680 --> 00:11:54,900

mounted on a stand here on the ground

295

00:11:59,650 --> 00:11:57,690

the next picture over the intensity

296

00:12:01,910 --> 00:11:59,660

image you can see basically all blue

297

00:12:04,520 --> 00:12:01,920

kind of hard to see there but very

298

00:12:06,230 --> 00:12:04,530

specifically you can see the five red

299

00:12:08,390 --> 00:12:06,240

dots where the reflectors are that

300

00:12:11,300 --> 00:12:08,400

because they return signal from those

301  
00:12:12,950 --> 00:12:11,310  
reflectors is much more intense than the

302  
00:12:16,040 --> 00:12:12,960  
reflected signal from the surrounding

303  
00:12:17,900 --> 00:12:16,050  
surfaces so the system as a knowledge of

304  
00:12:19,850 --> 00:12:17,910  
where those reflectors are and then can

305  
00:12:22,580 --> 00:12:19,860  
do some computations to determine the

306  
00:12:27,290 --> 00:12:22,590  
relative orientation which is critical

307  
00:12:28,970 --> 00:12:27,300  
for docking two spacecraft so all these

308  
00:12:31,760 --> 00:12:28,980  
images will be process to identify the

309  
00:12:34,910 --> 00:12:31,770  
targets determination of its range range

310  
00:12:36,590 --> 00:12:34,920  
rate attitude and bearing all these are

311  
00:12:40,280 --> 00:12:36,600  
critical parameters to allow for a

312  
00:12:41,900 --> 00:12:40,290  
successful docking of two spacecraft so

313  
00:12:44,960 --> 00:12:41,910

we're really excited about having this

314

00:12:46,310 --> 00:12:44,970

storm test on this flight and it's also

315

00:12:48,170 --> 00:12:46,320

going to allow endeavour to fly a very

316

00:12:50,240 --> 00:12:48,180

unique trajectory on undocking day we'll

317

00:12:56,690 --> 00:12:50,250

talk more detail about that in just a

318

00:12:59,240 --> 00:12:56,700

little bit so now I'll go and give you

319

00:13:01,430 --> 00:12:59,250

an overview of the payload bay is an

320

00:13:04,250 --> 00:13:01,440

orbiter if I can get the payload Bay

321

00:13:06,740 --> 00:13:04,260

video rolling here there we go so in the

322

00:13:09,500 --> 00:13:06,750

front of the vehicle you're going to see

323

00:13:11,570 --> 00:13:09,510

the orbiter docking system which is

324

00:13:15,410 --> 00:13:11,580

allows us to actually doc and mate with

325

00:13:16,910 --> 00:13:15,420

the space station on the starboard sill

326

00:13:19,250 --> 00:13:16,920

of the payload bay is the orbiter boom

327

00:13:21,269 --> 00:13:19,260

sensor system that we use for the TPS

328

00:13:23,309 --> 00:13:21,279

inspections

329

00:13:27,449 --> 00:13:23,319

on the opposite ports ill there is the

330

00:13:30,269 --> 00:13:27,459

shuttle robotic arm and here in the

331

00:13:32,519 --> 00:13:30,279

front of the ODS along the trust is the

332

00:13:34,259 --> 00:13:32,529

sensor enclosure and sent assembly for

333

00:13:37,259 --> 00:13:34,269

the storm that's where the two sensors

334

00:13:39,809 --> 00:13:37,269

are located then on the port side wall

335

00:13:42,480 --> 00:13:39,819

there in Bay 3 is the avionics enclosure

336

00:13:44,759 --> 00:13:42,490

it's the two piece of hardware on the

337

00:13:46,199 --> 00:13:44,769

payload Bay for storm in the center of

338

00:13:47,910 --> 00:13:46,209

the payload Bay is the Express logistics

339

00:13:49,889 --> 00:13:47,920

carrier 3 it's going to have a lot of

340

00:13:53,519 --> 00:13:49,899

spare parts for Space Station and in the

341

00:13:59,879 --> 00:13:53,529

back is the AMS that rounds out the

342

00:14:00,840 --> 00:13:59,889

cargo bay so with that I think we'll go

343

00:14:01,889 --> 00:14:00,850

ahead and walk you through day by day

344

00:14:02,819 --> 00:14:01,899

through the mission give you the

345

00:14:05,160 --> 00:14:02,829

highlights of what we're going to be

346

00:14:07,199 --> 00:14:05,170

accomplished in each day flight day one

347

00:14:09,329 --> 00:14:07,209

of course is dedicated to getting

348

00:14:11,220 --> 00:14:09,339

endeavor into space get her off the

349

00:14:13,769 --> 00:14:11,230

launch pad and Richard and his team will

350

00:14:16,710 --> 00:14:13,779

get her accelerated to 17,500 miles an

351  
00:14:18,299 --> 00:14:16,720  
hour and then get set up for orbit

352  
00:14:21,199 --> 00:14:18,309  
operations convert the vehicle from a

353  
00:14:23,610 --> 00:14:21,209  
launch vehicle to a orbital spacecraft

354  
00:14:25,740 --> 00:14:23,620  
as soon as we get to orbit crew members

355  
00:14:28,049 --> 00:14:25,750  
throw a couple switches allow endeavor

356  
00:14:29,490 --> 00:14:28,059  
to provide power to the AMS payload and

357  
00:14:31,799 --> 00:14:29,500  
then the ground team here in Mission

358  
00:14:33,509 --> 00:14:31,809  
Control for the MS folks we'll go ahead

359  
00:14:36,600 --> 00:14:33,519  
and start to activate and check out the

360  
00:14:39,540 --> 00:14:36,610  
MS payload and make sure that the ride

361  
00:14:42,360 --> 00:14:39,550  
to space did not cause any any issues

362  
00:14:44,129 --> 00:14:42,370  
with the payload and they'll work that

363  
00:14:47,639 --> 00:14:44,139

activation and check out for the first

364

00:14:49,769 --> 00:14:47,649

couple days in the mission will also go

365

00:14:52,079 --> 00:14:49,779

ahead and a couple crew members will get

366

00:14:53,819 --> 00:14:52,089

the shuttle robotic arm take it out for

367

00:14:55,319 --> 00:14:53,829

a short test drive do a check out event

368

00:14:57,350 --> 00:14:55,329

as well to make sure it's all ready to

369

00:14:59,519 --> 00:14:57,360

go for the inspection on flight day two

370

00:15:01,679 --> 00:14:59,529

and then the end of the day we'll wrap

371

00:15:03,269 --> 00:15:01,689

up with their standard downlink of all

372

00:15:04,860 --> 00:15:03,279

the imagery taken during the ascent of

373

00:15:07,079 --> 00:15:04,870

the external tank umbilical well

374

00:15:08,669 --> 00:15:07,089

pictures etc get that down to the ground

375

00:15:10,619 --> 00:15:08,679

team to start analyzing as quickly as

376

00:15:14,639 --> 00:15:10,629

possible to see how we perform during

377

00:15:17,790 --> 00:15:14,649

the asset flight day two of course is

378

00:15:20,100 --> 00:15:17,800

going to be our standard TPS inspection

379

00:15:22,259 --> 00:15:20,110

day I think we'll roll a video here and

380

00:15:25,290 --> 00:15:22,269

show you the robotic operations involved

381

00:15:26,549 --> 00:15:25,300

in that shoulder will come on over to

382

00:15:30,210 --> 00:15:26,559

the opposite side of the vehicle and

383

00:15:33,540 --> 00:15:30,220

pick up the OB SS and move out to the

384

00:15:35,110 --> 00:15:33,550

starboard wing and do a quick called a

385

00:15:39,310 --> 00:15:35,120

flat field survey

386

00:15:41,290 --> 00:15:39,320

a quick look at well look at the ohms

387

00:15:45,430 --> 00:15:41,300

pod their first since we're in a good

388

00:15:47,170 --> 00:15:45,440

position to do that then we'll do a

389

00:15:49,060 --> 00:15:47,180

quick flat field survey allowing the

390

00:15:50,560 --> 00:15:49,070

ground team to calibrate the sensors and

391

00:15:54,550 --> 00:15:50,570

then we'll pick up with the start of the

392

00:15:57,280 --> 00:15:54,560

wings survey will be picking up detailed

393

00:15:59,500 --> 00:15:57,290

information on the RCC panels on the

394

00:16:01,540 --> 00:15:59,510

four leading edge of the both wings as

395

00:16:05,050 --> 00:16:01,550

well as the nose cap these are the areas

396

00:16:08,230 --> 00:16:05,060

that receive the highest temperatures on

397

00:16:09,310 --> 00:16:08,240

the re-entry and return to to earth so I

398

00:16:12,100 --> 00:16:09,320

want to make sure that no damage

399

00:16:17,740 --> 00:16:12,110

occurred to those panels on the on the

400

00:16:21,420 --> 00:16:17,750

right up to orbit so they were finishing

401  
00:16:26,470 --> 00:16:24,820  
door racetrack motions go up and down

402  
00:16:28,420 --> 00:16:26,480  
the wing to make sure we capture all the

403  
00:16:31,030 --> 00:16:28,430  
surface area and we'll pause here and

404  
00:16:32,680 --> 00:16:31,040  
take quick look at the t0 umbilical on

405  
00:16:34,360 --> 00:16:32,690  
that side of the vehicle as well as that

406  
00:16:37,510 --> 00:16:34,370  
ohms pod make sure there's no issues

407  
00:16:44,470 --> 00:16:37,520  
there then we'll pick up and complete

408  
00:16:46,180 --> 00:16:44,480  
the port wing survey and of course the

409  
00:16:47,920 --> 00:16:46,190  
ground team will start analyzing this

410  
00:16:49,930 --> 00:16:47,930  
data as quickly as we can get it to the

411  
00:16:51,519 --> 00:16:49,940  
ground some of it comes down in real

412  
00:16:53,560 --> 00:16:51,529  
time and and the rest of it will bound

413  
00:16:56,199 --> 00:16:53,570

line as soon as the inspection is

414

00:16:57,510 --> 00:16:56,209

complete and hopefully everything will

415

00:17:00,250 --> 00:16:57,520

go well and they'll get all that data

416

00:17:05,860 --> 00:17:00,260

analyzed and turn around and clear the

417

00:17:07,419 --> 00:17:05,870

vehicle by flight day 3 flight 93 so

418

00:17:10,689 --> 00:17:07,429

with the inspection complete the arm

419

00:17:12,970 --> 00:17:10,699

will go ahead and put opss back and do

420

00:17:17,350 --> 00:17:12,980

it's a carriage on the starboard sill

421

00:17:19,990 --> 00:17:17,360

and release it and then we'll go ahead

422

00:17:22,299 --> 00:17:20,000

and take advantage of this to grapple

423

00:17:24,850 --> 00:17:22,309

the ELC payload and stand that config

424

00:17:28,360 --> 00:17:24,860

and be ready to install the ELC right

425

00:17:29,890 --> 00:17:28,370

after docking a couple other activities

426  
00:17:32,530 --> 00:17:29,900  
will accomplish on flight day two will

427  
00:17:34,480 --> 00:17:32,540  
be a a couple of that space walkers will

428  
00:17:35,980 --> 00:17:34,490  
check out their their spacesuits make

429  
00:17:37,330 --> 00:17:35,990  
sure everything is looking good there be

430  
00:17:38,710 --> 00:17:37,340  
ready to transfer those over to the

431  
00:17:41,740 --> 00:17:38,720  
space station to get ready for the four

432  
00:17:43,180 --> 00:17:41,750  
spacewalks and then the rest of the key

433  
00:17:44,440 --> 00:17:43,190  
activities for the day will be checking

434  
00:17:46,090 --> 00:17:44,450  
out some of the round of those systems

435  
00:17:48,160 --> 00:17:46,100  
for the rendezvous on flight day three

436  
00:17:49,000 --> 00:17:48,170  
that includes centerline camera

437  
00:17:51,100 --> 00:17:49,010  
installation

438  
00:17:54,790 --> 00:17:51,110

the orbiter docking system ring

439

00:17:56,470 --> 00:17:54,800

extension run over tools check out and

440

00:17:58,600 --> 00:17:56,480

for this flight will do a storm tools

441

00:18:00,820 --> 00:17:58,610

check out you'll get the storm laptop

442

00:18:02,500 --> 00:18:00,830

pocket that software fired up and take a

443

00:18:05,740 --> 00:18:02,510

look at the system make sure everything

444

00:18:11,080 --> 00:18:05,750

looks good there and that'll lead us

445

00:18:13,540 --> 00:18:11,090

into flight day 3 the rendezvous day the

446

00:18:15,220 --> 00:18:13,550

storm system will go ahead and be be

447

00:18:17,470 --> 00:18:15,230

turned on and ready to start supporting

448

00:18:19,840 --> 00:18:17,480

at its acquisition range of about 20,000

449

00:18:23,650 --> 00:18:19,850

feet and we'll start a video here which

450

00:18:25,420 --> 00:18:23,660

occurs inside of that range so the video

451  
00:18:27,310 --> 00:18:25,430  
starts here just underneath Space

452  
00:18:30,580 --> 00:18:27,320  
Station we're just about 600 feet out

453  
00:18:33,520 --> 00:18:30,590  
and get ready to start the RPM maneuver

454  
00:18:35,890 --> 00:18:33,530  
the right of a pitch maneuver commander

455  
00:18:38,080 --> 00:18:35,900  
Kelly will halt the vehicles approach at

456  
00:18:41,920 --> 00:18:38,090  
this point get the initial condition set

457  
00:18:44,050 --> 00:18:41,930  
up and then kick off the the RPM you'll

458  
00:18:45,970 --> 00:18:44,060  
see the flash is here are indicative of

459  
00:18:48,430 --> 00:18:45,980  
the space station crew members taking a

460  
00:18:50,880 --> 00:18:48,440  
lot of very high-resolution digital

461  
00:18:53,050 --> 00:18:50,890  
images of the entire surfaces of

462  
00:18:56,320 --> 00:18:53,060  
endeavor as it does it's complete

463  
00:18:57,490 --> 00:18:56,330

backflip and again this information

464

00:18:59,350 --> 00:18:57,500

we're down link to the ground as well

465

00:19:01,240 --> 00:18:59,360

for the engineers on the ground analyze

466

00:19:05,890 --> 00:19:01,250

and verify that everything on the on the

467

00:19:09,730 --> 00:19:05,900

vehicle looks good once that RPM is

468

00:19:11,470 --> 00:19:09,740

complete mark will go ahead and set up

469

00:19:13,390 --> 00:19:11,480

the right conditions and fly endeavour

470

00:19:15,400 --> 00:19:13,400

up in front of the space station on what

471

00:19:17,700 --> 00:19:15,410

we call the  $\bar{v}$  it's a velocity vector

472

00:19:20,020 --> 00:19:17,710

that the space station is flying in

473

00:19:21,730 --> 00:19:20,030

helped our approach there and get set up

474

00:19:26,050 --> 00:19:21,740

to start the final approach into the

475

00:19:27,250 --> 00:19:26,060

docking port and as he's flying in it

476

00:19:29,320 --> 00:19:27,260

will take a good close look at the

477

00:19:31,240 --> 00:19:29,330

vehicles alignment if any adjustments

478

00:19:32,860 --> 00:19:31,250

are required he'll stop at 30 feet make

479

00:19:34,840 --> 00:19:32,870

those adjustments and then push in for

480

00:19:41,880 --> 00:19:34,850

the final approach in and docking at the

481

00:19:44,320 --> 00:19:41,890

space station okay with that they'll get

482

00:19:46,360 --> 00:19:44,330

we'll go ahead and get the hooks driven

483

00:19:48,310 --> 00:19:46,370

get the two vehicles securely mated

484

00:19:51,220 --> 00:19:48,320

together after all the motion is is

485

00:19:52,600 --> 00:19:51,230

successfully damped out and then we'll

486

00:19:54,820 --> 00:19:52,610

go ahead and open the hatches the crews

487

00:19:56,680 --> 00:19:54,830

will greet each other and we'll do a

488

00:20:00,550 --> 00:19:56,690

quick safety briefing so the shuttle

489

00:20:02,980 --> 00:20:00,560

crew is up to speed on any any emergency

490

00:20:05,049 --> 00:20:02,990

response actions they might have to take

491

00:20:06,880 --> 00:20:05,059

they're docked to the station and then

492

00:20:08,410 --> 00:20:06,890

it'll be time to get to work in that

493

00:20:10,390 --> 00:20:08,420

point I'll turn it over to Derek talk

494

00:20:13,419 --> 00:20:10,400

about activities will accomplish during

495

00:20:15,370 --> 00:20:13,429

the dock time frame okay thanks Gary and

496

00:20:17,890 --> 00:20:15,380

good morning everybody it's a pleasure

497

00:20:19,299 --> 00:20:17,900

to be here today to talk about what I

498

00:20:21,700 --> 00:20:19,309

expect to be a very exciting and very

499

00:20:23,140 --> 00:20:21,710

challenging mission Gary and I have been

500

00:20:24,970 --> 00:20:23,150

working on preparing for this mission

501  
00:20:26,860 --> 00:20:24,980  
for a number of years so it's it's

502  
00:20:30,130 --> 00:20:26,870  
pretty gratifying and pretty exciting to

503  
00:20:33,100 --> 00:20:30,140  
be this close to launch before I pick

504  
00:20:34,450 --> 00:20:33,110  
back up with the flight day three with

505  
00:20:36,190 --> 00:20:34,460  
the mission overview I'm going to first

506  
00:20:37,840 --> 00:20:36,200  
talk about the flight directors that are

507  
00:20:40,990 --> 00:20:37,850  
going to be staffing the mission on the

508  
00:20:42,810 --> 00:20:41,000  
space station side I'll be the orbit two

509  
00:20:45,669 --> 00:20:42,820  
or lead flight director for this mission

510  
00:20:48,850 --> 00:20:45,679  
and the orbit to shift is aligned

511  
00:20:51,070 --> 00:20:48,860  
basically with the with the last half of

512  
00:20:53,049 --> 00:20:51,080  
the crew day and ani ba days that my

513  
00:20:55,990 --> 00:20:53,059

team will be on console I'll also be on

514

00:20:59,350 --> 00:20:56,000

console for the AMS installation as well

515

00:21:00,970 --> 00:20:59,360

as the Ic3 installation Dana weigel is

516

00:21:02,620 --> 00:21:00,980

going to be the orbit one flight

517

00:21:04,180 --> 00:21:02,630

director it's see a picture of Dana

518

00:21:06,880 --> 00:21:04,190

there she was selected as a flight

519

00:21:09,700 --> 00:21:06,890

director in 2005 she was the lead flight

520

00:21:12,370 --> 00:21:09,710

director for the STS 123 1 J a mission

521

00:21:15,730 --> 00:21:12,380

so you may recognize her from previous

522

00:21:17,770 --> 00:21:15,740

briefings that that she got here she was

523

00:21:21,250 --> 00:21:17,780

also my orbit one flight director on my

524

00:21:22,540 --> 00:21:21,260

last lead which was STS 120 Dana and I

525

00:21:24,490 --> 00:21:22,550

have worked together a number of times I

526

00:21:26,350 --> 00:21:24,500

look forward to working with her again

527

00:21:28,240 --> 00:21:26,360

on this mission as orbit one flight

528

00:21:30,310 --> 00:21:28,250

director she and her team will be on

529

00:21:33,040 --> 00:21:30,320

console for the first half of the crew

530

00:21:34,360 --> 00:21:33,050

day which means ani ba days she'll she

531

00:21:35,950 --> 00:21:34,370

and her team will be responsible for

532

00:21:38,490 --> 00:21:35,960

getting the crew prepared for the EBA

533

00:21:42,820 --> 00:21:38,500

and then out the hatch at which point

534

00:21:45,190 --> 00:21:42,830

the orbit 2 team comes on the orbit 3 or

535

00:21:47,380 --> 00:21:45,200

planning flight director on the station

536

00:21:49,510 --> 00:21:47,390

side will be Deena Katella cantella

537

00:21:50,710 --> 00:21:49,520

Deena is one of the newer flight

538

00:21:54,100 --> 00:21:50,720

directors in the office she was selected

539

00:21:57,400 --> 00:21:54,110

in 2008 she's done a large number of

540

00:21:58,770 --> 00:21:57,410

increment shifts on console for the

541

00:22:01,180 --> 00:21:58,780

space station or the shifts between

542

00:22:03,970 --> 00:22:01,190

between shuttle flights but this will be

543

00:22:06,730 --> 00:22:03,980

her first space shuttle assembly mission

544

00:22:09,190 --> 00:22:06,740

and then finally Dave korth is going to

545

00:22:11,680 --> 00:22:09,200

be the team for flight director and as

546

00:22:14,290 --> 00:22:11,690

as Gary mentioned team for is basically

547

00:22:16,330 --> 00:22:14,300

a resource that we have in place before

548

00:22:17,769 --> 00:22:16,340

the mission that can work

549

00:22:20,289 --> 00:22:17,779

off console any kind of additional

550

00:22:22,269 --> 00:22:20,299

analysis or assessments that come up

551

00:22:23,980 --> 00:22:22,279

during the mission so in theory if it's

552

00:22:27,010 --> 00:22:23,990

a smooth flight without any surprises or

553

00:22:29,169 --> 00:22:27,020

failures David won't have a lot to do

554

00:22:30,519 --> 00:22:29,179

but that's typically not the case when

555

00:22:33,580 --> 00:22:30,529

you and you are going to something

556

00:22:35,200 --> 00:22:33,590

that's complicated so those are the

557

00:22:37,210 --> 00:22:35,210

station flight directors that will be

558

00:22:40,000 --> 00:22:37,220

supporting working with me and and their

559

00:22:42,490 --> 00:22:40,010

teams to make this mission happen I'll

560

00:22:44,350 --> 00:22:42,500

now talk about the expedition 27 crew

561

00:22:46,690 --> 00:22:44,360

that will be on the space station when

562

00:22:50,350 --> 00:22:46,700

134 arrives if we could get that still

563

00:22:53,110 --> 00:22:50,360

up there starting on the right in this

564

00:22:56,470 --> 00:22:53,120

picture you can see cut the commander of

565

00:22:59,260 --> 00:22:56,480

the space station dmitry kondratyev to

566

00:23:02,350 --> 00:22:59,270

his left is andrey borisenko next is

567

00:23:04,149 --> 00:23:02,360

Cady Coleman will be one of two US crew

568

00:23:05,889 --> 00:23:04,159

members on the station at the time of

569

00:23:09,909 --> 00:23:05,899

134 and katie is actually on board right

570

00:23:14,560 --> 00:23:09,919

now continuing to the left is alexander

571

00:23:17,320 --> 00:23:14,570

samokutyaev then paolo nespoli who's the

572

00:23:19,060 --> 00:23:17,330

European Space Agency astronaut beyond

573

00:23:21,100 --> 00:23:19,070

bored for 134 and it's actually on board

574

00:23:24,549 --> 00:23:21,110

today and then finally on the 4th on the

575

00:23:27,159 --> 00:23:24,559

far left is ron garan Dimitri Paulo and

576  
00:23:29,350 --> 00:23:27,169  
Katie arrived on the station December

577  
00:23:32,190 --> 00:23:29,360  
17th of last year and they're scheduled

578  
00:23:34,960 --> 00:23:32,200  
to come home May of this year may 2011

579  
00:23:37,000 --> 00:23:34,970  
Andre Alexander and Ron Garan are

580  
00:23:39,250 --> 00:23:37,010  
scheduled to arrive on station April

581  
00:23:40,810 --> 00:23:39,260  
sixteenth so early next month and

582  
00:23:45,070 --> 00:23:40,820  
they're scheduled to come home on sep

583  
00:23:47,230 --> 00:23:45,080  
tember 2011 September this year and as

584  
00:23:49,389 --> 00:23:47,240  
has been the case in in past Shuttle

585  
00:23:52,149 --> 00:23:49,399  
missions we rely quite extensively on

586  
00:23:53,560 --> 00:23:52,159  
the station crew to help us with all of

587  
00:23:56,350 --> 00:23:53,570  
the activities associated with the

588  
00:23:58,480 --> 00:23:56,360

mission specifically the station crew

589

00:24:00,399 --> 00:23:58,490

assists and all the space station

590

00:24:03,279 --> 00:24:00,409

robotic arm activities lending their

591

00:24:05,470 --> 00:24:03,289

expertise and support for those

592

00:24:07,899 --> 00:24:05,480

activities we also depend on the space

593

00:24:10,779 --> 00:24:07,909

space station crew to help us prepare

594

00:24:14,649 --> 00:24:10,789

the crew the EBA crews on the morning of

595

00:24:17,139 --> 00:24:14,659

EBA days and then to to configure post

596

00:24:19,899 --> 00:24:17,149

DBA ani ba days in addition they help

597

00:24:20,889 --> 00:24:19,909

help with the transfer activities and a

598

00:24:24,430 --> 00:24:20,899

lot of the science that we're going to

599

00:24:26,380 --> 00:24:24,440

be doing and if I could have the next

600

00:24:28,389 --> 00:24:26,390

still I'll give you a quick update of

601  
00:24:29,769 --> 00:24:28,399  
the current configuration of this

602  
00:24:33,549 --> 00:24:29,779  
station as as it

603  
00:24:35,229 --> 00:24:33,559  
we'll be as 134 approaches and docks you

604  
00:24:37,899 --> 00:24:35,239  
can see the two silly spacecraft we

605  
00:24:40,869 --> 00:24:37,909  
expect to have a progress attached and

606  
00:24:42,879 --> 00:24:40,879  
we also expect to have a TV to attach to

607  
00:24:45,430 --> 00:24:42,889  
the station you will notice that this

608  
00:24:48,029 --> 00:24:45,440  
does not show HTV the expectation is

609  
00:24:52,089 --> 00:24:48,039  
that the HTV will be unbirth and

610  
00:24:55,060 --> 00:24:52,099  
deorbited on march the 28s plan despite

611  
00:24:58,139 --> 00:24:55,070  
the challenges of course due to the

612  
00:25:01,089 --> 00:24:58,149  
events in japan next still police you

613  
00:25:03,399 --> 00:25:01,099

just basically a shot with endeavour

614

00:25:04,629 --> 00:25:03,409

docked to the space station one

615

00:25:08,049 --> 00:25:04,639

interesting thing that will become clear

616

00:25:10,060 --> 00:25:08,059

as as I talk through the subsequent

617

00:25:12,459 --> 00:25:10,070

mission days and specifically the EV a

618

00:25:14,769 --> 00:25:12,469

days we're doing work up and down the

619

00:25:17,649 --> 00:25:14,779

truss we're doing work on the port side

620

00:25:20,829 --> 00:25:17,659

of the truss in terms of ammonia coolant

621

00:25:22,479 --> 00:25:20,839

loops and the lc3 installation we're

622

00:25:26,109 --> 00:25:22,489

doing work on the starboard side of the

623

00:25:28,539 --> 00:25:26,119

truss with the AMS installation and also

624

00:25:31,239 --> 00:25:28,549

the installation of the orbiter boom

625

00:25:33,639 --> 00:25:31,249

sensing system or OBS s on the trust so

626

00:25:35,529 --> 00:25:33,649

a little bit different than previous

627

00:25:38,049 --> 00:25:35,539

flights where we had generally an area

628

00:25:39,310 --> 00:25:38,059

of focus for this mission we've got two

629

00:25:41,499 --> 00:25:39,320

major payloads that will install

630

00:25:43,180 --> 00:25:41,509

robotically and then we have EV a tasks

631

00:25:47,440 --> 00:25:43,190

that take us up and down the station

632

00:25:49,930 --> 00:25:47,450

truss and next I'll talk in more detail

633

00:25:51,820 --> 00:25:49,940

about the the two primary payloads that

634

00:25:54,339 --> 00:25:51,830

we have in the orbiter payload Bay which

635

00:25:56,739 --> 00:25:54,349

Gary introduced you to first I'll talk

636

00:25:58,599 --> 00:25:56,749

about express logistics carrier number

637

00:26:01,899 --> 00:25:58,609

three or LC three if I could have the

638

00:26:04,289 --> 00:26:01,909

still excuse me the video and we've got

639

00:26:08,379 --> 00:26:04,299

a number of spares on ELC number three

640

00:26:10,749 --> 00:26:08,389

which are depicted here see first we got

641

00:26:12,940 --> 00:26:10,759

a cargo transport container or CTC which

642

00:26:15,759 --> 00:26:12,950

has a number of spare electrical power

643

00:26:22,180 --> 00:26:15,769

components we have a 1 of 2 s band and

644

00:26:25,599 --> 00:26:22,190

tennis we have a spdm arm spare arm on

645

00:26:28,659 --> 00:26:25,609

the ELC on the opposite side of the ELC

646

00:26:30,099 --> 00:26:28,669

we have an ammonia tank assembly which

647

00:26:32,349 --> 00:26:30,109

can be used to support the external

648

00:26:33,430 --> 00:26:32,359

ammonia cooling loops we have a

649

00:26:37,239 --> 00:26:33,440

high-pressure gas tank with

650

00:26:38,979 --> 00:26:37,249

high-pressure oxygen for the airlock we

651  
00:26:41,590 --> 00:26:38,989  
have a payload that comes up on the ELC

652  
00:26:44,140 --> 00:26:41,600  
the space test project

653  
00:26:47,860 --> 00:26:44,150  
and finally we have the second s-band

654  
00:26:49,930 --> 00:26:47,870  
antenna assembly so a number of critical

655  
00:26:53,049 --> 00:26:49,940  
spares that are intended to support the

656  
00:26:55,840 --> 00:26:53,059  
station as it continues its operation

657  
00:26:57,460 --> 00:26:55,850  
post shuttle of course the other major

658  
00:26:59,320 --> 00:26:57,470  
palin and the payload bay you heard

659  
00:27:01,270 --> 00:26:59,330  
heard about quite extensively in the

660  
00:27:04,150 --> 00:27:01,280  
previous briefing and that's the Alpha

661  
00:27:07,390 --> 00:27:04,160  
Magnetic Spectrometer AMS too gotta

662  
00:27:09,880 --> 00:27:07,400  
still hear of the processing at KSC and

663  
00:27:11,940 --> 00:27:09,890

then I've also got kind of an overview

664

00:27:14,110 --> 00:27:11,950  
of the key components they AMS and

665

00:27:15,520 --> 00:27:14,120  
because of the the detailed he got in

666

00:27:17,980 --> 00:27:15,530  
the previous briefing I won't spend a

667

00:27:20,310 --> 00:27:17,990  
lot of time talking about the operation

668

00:27:23,110 --> 00:27:20,320  
of AMS but suffice it to say that

669

00:27:25,060 --> 00:27:23,120  
everybody is extremely excited about the

670

00:27:26,890 --> 00:27:25,070  
opportunity that we have to to launch

671

00:27:29,799 --> 00:27:26,900  
and activate this payload and there's

672

00:27:31,779 --> 00:27:29,809  
tremendous expectations in terms of the

673

00:27:32,799 --> 00:27:31,789  
science and the research and the

674

00:27:36,850 --> 00:27:32,809  
knowledge that we're going to get from

675

00:27:40,000 --> 00:27:36,860  
AMS okay with that I'll move back into

676  
00:27:43,000 --> 00:27:40,010  
the the flight day overview picking back

677  
00:27:45,399 --> 00:27:43,010  
up with flight day three where Gary left

678  
00:27:46,990 --> 00:27:45,409  
off after the hatches get open the crews

679  
00:27:49,149 --> 00:27:47,000  
get acclimated they get their safety

680  
00:27:52,870 --> 00:27:49,159  
safety briefing we hit the ground

681  
00:27:55,060 --> 00:27:52,880  
running with the ELC three on birth from

682  
00:27:57,070 --> 00:27:55,070  
the shuttle payload Bay an installation

683  
00:28:00,730 --> 00:27:57,080  
on the truss and I've got a video

684  
00:28:02,470 --> 00:28:00,740  
depicting that operation you can see the

685  
00:28:04,000 --> 00:28:02,480  
the payload being pulled out of the

686  
00:28:05,649 --> 00:28:04,010  
payload Bay using the shuttle arm and

687  
00:28:07,659 --> 00:28:05,659  
that'll be finkin Vittori operating the

688  
00:28:09,760 --> 00:28:07,669

shuttle arm they translate the payload

689

00:28:12,370 --> 00:28:09,770

to a predetermined hand off position and

690

00:28:15,430 --> 00:28:12,380

they stop there at that point Greg

691

00:28:20,380 --> 00:28:15,440

Johnson and Greg shuttles off then grapple

692

00:28:25,029 --> 00:28:20,390

the lc3 with the station arm and then

693

00:28:28,600 --> 00:28:25,039

they carefully maneuver ELC 32 it's to

694

00:28:30,310 --> 00:28:28,610

its installation site on on the space

695

00:28:32,080 --> 00:28:30,320

station truss and one thing that's a

696

00:28:34,149 --> 00:28:32,090

little bit different about both the AMS

697

00:28:36,520 --> 00:28:34,159

and the ill c payloads is that there's

698

00:28:37,840 --> 00:28:36,530

no additional activity required to make

699

00:28:39,940 --> 00:28:37,850

the connections that connection is

700

00:28:41,890 --> 00:28:39,950

automatic and remotely controlled once

701  
00:28:44,049 --> 00:28:41,900  
it gets installed on the truss you'll

702  
00:28:46,180 --> 00:28:44,059  
see here the the mobile transporter with

703  
00:28:48,250 --> 00:28:46,190  
the station arm attached then translates

704  
00:28:49,840 --> 00:28:48,260  
the work site that's required for the

705  
00:28:55,539 --> 00:28:49,850  
next day's activities which say ms

706  
00:28:58,090 --> 00:28:55,549  
install and once we finish

707  
00:29:01,629 --> 00:28:58,100  
lc3 installed that's basically into

708  
00:29:04,960 --> 00:29:01,639  
flight day three flight day 4 begins our

709  
00:29:08,320 --> 00:29:04,970  
AMS activities and I've also got a video

710  
00:29:10,749 --> 00:29:08,330  
here that shows shows you that for AMS

711  
00:29:12,369 --> 00:29:10,759  
installation Foy stolen vittoria will be

712  
00:29:14,019 --> 00:29:12,379  
operating the shuttle arm and similar to

713  
00:29:16,330 --> 00:29:14,029

LC three wheeze the shuttle arm to

714

00:29:18,249 --> 00:29:16,340

extract the payload from the shuttle

715

00:29:20,710 --> 00:29:18,259

payload Bay we maneuver to again a

716

00:29:23,440 --> 00:29:20,720

predetermined handoff point at which

717

00:29:25,509 --> 00:29:23,450

point Greg Johnson and Greg shan't off

718

00:29:31,149 --> 00:29:25,519

again on the station arm maneuver the

719

00:29:32,979 --> 00:29:31,159

rmn and grapple the MS payload once

720

00:29:35,769 --> 00:29:32,989

that's complete the shuttle arm backs

721

00:29:37,810 --> 00:29:35,779

off to a viewing position to give us

722

00:29:40,029 --> 00:29:37,820

good views with AMS install operation on

723

00:29:43,869 --> 00:29:40,039

the on the port side excuse me the

724

00:29:46,060 --> 00:29:43,879

starboard side of the truss and at that

725

00:29:47,919 --> 00:29:46,070

point Johnson and Shem Tov carefully

726

00:29:50,769 --> 00:29:47,929

maneuver the AMS to its installation

727

00:29:52,119 --> 00:29:50,779

site on the truss and again this is a in

728

00:29:53,889 --> 00:29:52,129

terms of the power and the data

729

00:29:55,810 --> 00:29:53,899

connections and the actual capture of

730

00:29:58,989 --> 00:29:55,820

the payload on the trust this is a

731

00:30:01,960 --> 00:29:58,999

completely remotely controlled operation

732

00:30:04,450 --> 00:30:01,970

that's controlled by the crew inside the

733

00:30:07,690 --> 00:30:04,460

space station as well as by ground

734

00:30:09,369 --> 00:30:07,700

controller so no II VA's cables are

735

00:30:11,080 --> 00:30:09,379

required to support either those

736

00:30:12,639 --> 00:30:11,090

activities then you can see the mobile

737

00:30:16,019 --> 00:30:12,649

transporter of the station arm attached

738

00:30:17,889 --> 00:30:16,029

then translates to the next worksite

739

00:30:19,930 --> 00:30:17,899

required to support the next day's

740

00:30:21,549 --> 00:30:19,940

activities so then the flight day for

741

00:30:23,859 --> 00:30:21,559

we've got ELC three installed on the

742

00:30:26,499 --> 00:30:23,869

trust receiving power and data flight

743

00:30:28,810 --> 00:30:26,509

day for we've got a ms installed on the

744

00:30:31,330 --> 00:30:28,820

truss power applied and at that point

745

00:30:33,639 --> 00:30:31,340

the AMS collaboration who's going to

746

00:30:35,320 --> 00:30:33,649

have a team in Mission Control I will

747

00:30:38,590 --> 00:30:35,330

begin all their activation check out

748

00:30:40,330 --> 00:30:38,600

activities on the AMS moving on to

749

00:30:43,090 --> 00:30:40,340

flight day 5 i'll start talking about

750

00:30:45,190 --> 00:30:43,100

our space walks or evaa plans for the

751

00:30:47,409 --> 00:30:45,200

mission and i'll say up front that

752

00:30:50,259 --> 00:30:47,419

you'll get a detailed briefing coming up

753

00:30:52,479 --> 00:30:50,269

next from our lead DBA officer allison

754

00:30:55,330 --> 00:30:52,489

Bolinger so i'm not going to go into a

755

00:30:56,619 --> 00:30:55,340

lot of detail about the about the EVs

756

00:30:58,629 --> 00:30:56,629

and the sequence but i'll hit the high

757

00:31:00,430 --> 00:30:58,639

points and and let's and help you guys

758

00:31:04,210 --> 00:31:00,440

understand what the primary objectives

759

00:31:06,970 --> 00:31:04,220

are EBA one will be conducted by voice

760

00:31:09,310 --> 00:31:06,980

tell and shama tov drood as Gary

761

00:31:11,710 --> 00:31:09,320

mentioned it has conducted

762

00:31:13,360 --> 00:31:11,720

previous TVA's during the last Hubble

763

00:31:17,080 --> 00:31:13,370

servicing mission and this will be Greg

764

00:31:19,210 --> 00:31:17,090

Shama Tom's first dva overnight between

765

00:31:21,129 --> 00:31:19,220

flight and eights 4 and 5 the crew slept

766

00:31:23,799 --> 00:31:21,139

in the US air lock doing what what we

767

00:31:25,990 --> 00:31:23,809

call the campout pre-breathe protocol so

768

00:31:27,940 --> 00:31:26,000

the night before before when they went

769

00:31:29,680 --> 00:31:27,950

to bed on flight day for the crew is

770

00:31:33,610 --> 00:31:29,690

buttoned up in the airlock we close the

771

00:31:35,379 --> 00:31:33,620

hatch we reduce the pressure to 10 2 and

772

00:31:38,350 --> 00:31:35,389

then they breathe an oxygen-rich

773

00:31:39,970 --> 00:31:38,360

environment overnight in order to purge

774

00:31:41,980 --> 00:31:39,980

nitrogen from their blood and tissue

775

00:31:44,740 --> 00:31:41,990

when they wake up on flight day 5

776

00:31:46,539 --> 00:31:44,750

they're ready to go we open the hat

777

00:31:49,240 --> 00:31:46,549

bring the pressure back up to the

778

00:31:50,649 --> 00:31:49,250

nominal pressure 14-7 open the hatch let

779

00:31:51,759 --> 00:31:50,659

them do what they need to do in the

780

00:31:55,029 --> 00:31:51,769

morning and then we start getting in

781

00:31:58,119 --> 00:31:55,039

suited up there's two primary objectives

782

00:31:59,980 --> 00:31:58,129

on EV a1 the first of which is the

783

00:32:02,169 --> 00:31:59,990

materials International Space Station

784

00:32:04,600 --> 00:32:02,179

experiment or missy experiment and this

785

00:32:06,580 --> 00:32:04,610

is the next in a series of experiments

786

00:32:10,590 --> 00:32:06,590

that are sponsored by the Department of

787

00:32:12,549 --> 00:32:10,600

Defense that look at the effective on

788

00:32:14,350 --> 00:32:12,559

materials over time of space

789

00:32:16,570 --> 00:32:14,360

environments we're first going to

790

00:32:18,999 --> 00:32:16,580

retrieve to Missy payloads that are

791

00:32:22,840 --> 00:32:19,009

currently on Space Station Missy 7a and

792

00:32:24,820 --> 00:32:22,850

Missy 7b we go out to ELC to which was

793

00:32:27,100 --> 00:32:24,830

installed when we arrived we pull off

794

00:32:29,009 --> 00:32:27,110

the Missy 7a and 7b we bring those

795

00:32:33,490 --> 00:32:29,019

payloads install them in the payload Bay

796

00:32:35,080 --> 00:32:33,500

then we pick up Missy 8 which is the the

797

00:32:36,700 --> 00:32:35,090

next in the line of Missy's which we

798

00:32:40,779 --> 00:32:36,710

brought up on this flight plug it in on

799

00:32:44,740 --> 00:32:40,789

alc to the other primary objective on

800

00:32:46,899 --> 00:32:44,750

this on this EBA is to set up for an

801  
00:32:47,860 --> 00:32:46,909  
ammonia fill activity on EV a2 and I'll

802  
00:32:50,110 --> 00:32:47,870  
just give you a little bit of background

803  
00:32:52,119 --> 00:32:50,120  
each of the power modules on the space

804  
00:32:54,940 --> 00:32:52,129  
station as an ammonia cooling loop that

805  
00:32:56,919 --> 00:32:54,950  
that runs continuously and keeps the

806  
00:32:59,950 --> 00:32:56,929  
batteries and other components on on the

807  
00:33:01,869 --> 00:32:59,960  
power channel within limits this p-6 p

808  
00:33:05,680 --> 00:33:01,879  
btcs which we're going to service on

809  
00:33:08,039 --> 00:33:05,690  
this mission has a slow leak that over

810  
00:33:10,110 --> 00:33:08,049  
time could cause the loss of that loop

811  
00:33:12,369 --> 00:33:10,120  
probably a year and a half to two years

812  
00:33:14,110 --> 00:33:12,379  
potentially depending on how the loop

813  
00:33:15,820 --> 00:33:14,120

behaves so what we're going to do on

814

00:33:18,490 --> 00:33:15,830

this mission is we're going to top off

815

00:33:21,789 --> 00:33:18,500

that PB TCS ammonia cooling loop such

816

00:33:23,049 --> 00:33:21,799

that we extend a life ideally if the

817

00:33:23,230 --> 00:33:23,059

field goes well we're going to send a

818

00:33:26,350 --> 00:33:23,240

lie

819

00:33:28,570 --> 00:33:26,360

a number of years so what we do on EV a

820

00:33:31,510 --> 00:33:28,580

number one is start the setup for the

821

00:33:36,220 --> 00:33:31,520

actual ammonia fill on Ani VA too we're

822

00:33:38,410 --> 00:33:36,230

out ammonia coolant lines we vent night

823

00:33:40,150 --> 00:33:38,420

a nitrogen pad that's in that line to

824

00:33:41,680 --> 00:33:40,160

protect the line and that we basically

825

00:33:44,950 --> 00:33:41,690

set up the pipeline that we're going to

826

00:33:46,330 --> 00:33:44,960

use on EBA to to make that to do that

827

00:33:47,710 --> 00:33:46,340

ammonia fill and again you'll have more

828

00:33:51,220 --> 00:33:47,720

detail about that during the EV a

829

00:33:54,430 --> 00:33:51,230

briefing coming up we also on EV a one

830

00:33:57,100 --> 00:33:54,440

install a couple of antennas on the

831

00:33:59,350 --> 00:33:57,110

external surface of the lab and those

832

00:34:01,840 --> 00:33:59,360

antennas are going to allow payloads and

833

00:34:04,870 --> 00:34:01,850

hardware on the external portions of the

834

00:34:07,180 --> 00:34:04,880

trust just to communicate why wirelessly

835

00:34:10,000 --> 00:34:07,190

have basically data transmission between

836

00:34:12,070 --> 00:34:10,010

those payloads the payloads and hardware

837

00:34:14,320 --> 00:34:12,080

on the trust to computers inside the

838

00:34:16,990 --> 00:34:14,330

space station so those are the major

839

00:34:19,930 --> 00:34:17,000

objectives objectives of EV a 1 and

840

00:34:22,000 --> 00:34:19,940

estimated EBA duration as it all as it

841

00:34:28,180 --> 00:34:22,010

is for all the VA's is six hours and 30

842

00:34:31,180 --> 00:34:28,190

minutes okay we can go to the next day

843

00:34:34,119 --> 00:34:31,190

which we flight day six of course we

844

00:34:37,240 --> 00:34:34,129

start off flight day six with OBS s

845

00:34:41,290 --> 00:34:37,250

grapple and handoff and I've got video

846

00:34:43,480 --> 00:34:41,300

portraying that here for this activity

847

00:34:45,820 --> 00:34:43,490

Greg Johnson & cady coleman this time

848

00:34:48,070 --> 00:34:45,830

will be operating station arm and they

849

00:34:50,260 --> 00:34:48,080

will remove the OBS s from the payload

850

00:34:53,099 --> 00:34:50,270

bay they'll present it to the shuttle

851  
00:34:57,400 --> 00:34:53,109  
arm operated by 4 cyl inventory and

852  
00:34:59,500 --> 00:34:57,410  
Andrew and Roberto will use the station

853  
00:35:01,120 --> 00:34:59,510  
arm excuse me the shuttle arm to grapple

854  
00:35:02,670 --> 00:35:01,130  
they will be SS which is the config that

855  
00:35:06,040 --> 00:35:02,680  
it will stand for the next several days

856  
00:35:07,900 --> 00:35:06,050  
flight day 6 is the day that we preserve

857  
00:35:09,790 --> 00:35:07,910  
time for a focused inspection if

858  
00:35:12,660 --> 00:35:09,800  
required that's a typical thing that we

859  
00:35:15,010 --> 00:35:12,670  
have done on all the recent missions

860  
00:35:16,900 --> 00:35:15,020  
basically if there are areas of interest

861  
00:35:17,950 --> 00:35:16,910  
or anything that folk that the analysts

862  
00:35:20,050 --> 00:35:17,960  
on the ground need to look at more

863  
00:35:21,910 --> 00:35:20,060

closely based on the data that was

864

00:35:25,630 --> 00:35:21,920

gathered early in the mission we would

865

00:35:27,670 --> 00:35:25,640

use the OB SS or the room sensor system

866

00:35:31,240 --> 00:35:27,680

to go take a look at those areas of

867

00:35:32,500 --> 00:35:31,250

interest the likelihood is that we won't

868

00:35:35,020 --> 00:35:32,510

need that time but we've got the time

869

00:35:36,720 --> 00:35:35,030

available on this day if we do need it

870

00:35:38,550 --> 00:35:36,730

do need it

871

00:35:40,440 --> 00:35:38,560

the other things we do on flight day six

872

00:35:42,420 --> 00:35:40,450

we do work in some well-deserved

873

00:35:43,650 --> 00:35:42,430

off-duty time for the Endeavour crew

874

00:35:46,230 --> 00:35:43,660

since they've been working pretty hard

875

00:35:48,240 --> 00:35:46,240

up to this point and then we start the

876  
00:35:51,000 --> 00:35:48,250  
preparations for EV a number two so we

877  
00:35:53,430 --> 00:35:51,010  
get all the call the tools required for

878  
00:35:56,010 --> 00:35:53,440  
EBA to gathered everything configured

879  
00:35:59,580 --> 00:35:56,020  
properly we do a final procedure review

880  
00:36:01,170 --> 00:35:59,590  
look at the last details even see if

881  
00:36:04,830 --> 00:36:01,180  
anything's change from what the pre

882  
00:36:06,900 --> 00:36:04,840  
flight plan was and then EV 82 will be

883  
00:36:09,750 --> 00:36:06,910  
conducted by Drew Foy stolen Mike Fink

884  
00:36:11,550 --> 00:36:09,760  
and and then they at the end of the day

885  
00:36:14,760 --> 00:36:11,560  
we put them in the airlock and they

886  
00:36:17,910 --> 00:36:14,770  
start their campout activities flight

887  
00:36:21,870 --> 00:36:17,920  
day seven we wake the crew up and Drew

888  
00:36:23,599 --> 00:36:21,880

and and Mike come out of the airlock to

889

00:36:28,530 --> 00:36:23,609

do what they need to do in the morning

890

00:36:32,160 --> 00:36:28,540

eat breakfast etc and then we start the

891

00:36:34,560 --> 00:36:32,170

EBA off with four EV a to the plan is to

892

00:36:37,020 --> 00:36:34,570

have Greg shamit off inside is the IBA I

893

00:36:39,060 --> 00:36:37,030

didn't mention on EV a one Mike Fink

894

00:36:41,400 --> 00:36:39,070

will be inside as I VA and basically the

895

00:36:43,109 --> 00:36:41,410

IBA is the astronaut inside the space

896

00:36:44,700 --> 00:36:43,119

station that has the detailed procedures

897

00:36:46,560 --> 00:36:44,710

for the EBA and he's he's the

898

00:36:48,810 --> 00:36:46,570

choreographer or the basically the

899

00:36:50,940 --> 00:36:48,820

leader of the EBA he steps the EV a crew

900

00:36:52,440 --> 00:36:50,950

through all of their activities and does

901  
00:36:53,760 --> 00:36:52,450  
all the coordination with with the

902  
00:36:59,190 --> 00:36:53,770  
ground as the crew works through their

903  
00:37:02,520 --> 00:36:59,200  
tasks the primary objectives on EV a2 or

904  
00:37:03,780 --> 00:37:02,530  
again as part of this pvt CS or ammonia

905  
00:37:06,060 --> 00:37:03,790  
cooling loop fill that I mentioned

906  
00:37:08,010 --> 00:37:06,070  
during DBA one we did the prep for four

907  
00:37:10,050 --> 00:37:08,020  
EV a2 we actually we actually do the

908  
00:37:13,020 --> 00:37:10,060  
fill we flow ammonia through these lines

909  
00:37:15,150 --> 00:37:13,030  
that we pre configured on EV a1 and we

910  
00:37:17,550 --> 00:37:15,160  
transfer approximately six to eight

911  
00:37:19,590 --> 00:37:17,560  
pounds of ammonia from an ammonia tank

912  
00:37:22,920 --> 00:37:19,600  
assembly with that includes a reservoir

913  
00:37:25,320 --> 00:37:22,930

of ammonia to the leaking p btcs loop in

914

00:37:28,590 --> 00:37:25,330

addition to the the ammonia operations

915

00:37:31,260 --> 00:37:28,600

we also perform a lubrication operation

916

00:37:34,050 --> 00:37:31,270

on the port solar alpha rotary joint or

917

00:37:36,690 --> 00:37:34,060

port Sarge and this lubrication

918

00:37:38,550 --> 00:37:36,700

operation is set as similar to what

919

00:37:40,470 --> 00:37:38,560

we've done over the past several flights

920

00:37:43,109 --> 00:37:40,480

some of you may recall that we had an

921

00:37:44,670 --> 00:37:43,119

issue with the Sarge's in that there was

922

00:37:46,680 --> 00:37:44,680

damage being done to the race rings

923

00:37:50,109 --> 00:37:46,690

which was affecting their performance

924

00:37:51,549 --> 00:37:50,119

was causing unacceptable vibration we

925

00:37:53,140 --> 00:37:51,559

developed a technique by which we can

926

00:37:56,200 --> 00:37:53,150

lubricate those sergeants in order to

927

00:37:58,210 --> 00:37:56,210

fix that problem and avoid additional

928

00:37:59,950 --> 00:37:58,220

damage in the future so what we're doing

929

00:38:01,749 --> 00:37:59,960

on the port Sarge here is basically a

930

00:38:03,039 --> 00:38:01,759

precautionary measure they head off any

931

00:38:07,180 --> 00:38:03,049

problems we might have in the future

932

00:38:08,980 --> 00:38:07,190

with this Sarge once the once the fill

933

00:38:11,529 --> 00:38:08,990

is done we have to do ammonia venting

934

00:38:13,029 --> 00:38:11,539

during this EV a so we flow the ammonia

935

00:38:15,819 --> 00:38:13,039

from the ammonia tank assembly to the

936

00:38:17,799 --> 00:38:15,829

leaking galoot at that point we close

937

00:38:20,079 --> 00:38:17,809

valves open cuties but then we've got

938

00:38:22,390 --> 00:38:20,089

ammonia isolated in some of the lines

939

00:38:24,970 --> 00:38:22,400

along the trust with with no pressure

940

00:38:27,489 --> 00:38:24,980

relief basically so once we completed

941

00:38:30,849 --> 00:38:27,499

the fill we're going to do to ammonia

942

00:38:33,900 --> 00:38:30,859

vents that clear ammonia from the lines

943

00:38:37,809 --> 00:38:33,910

that we used to fill the leaking loop

944

00:38:40,089 --> 00:38:37,819

and finally the spdm latching end

945

00:38:43,989 --> 00:38:40,099

effector we're going to do a lubrication

946

00:38:46,450 --> 00:38:43,999

activity on the spdm Lee or latching end

947

00:38:49,480 --> 00:38:46,460

effector and what that involves is is

948

00:38:52,450 --> 00:38:49,490

actually presenting this the spdm lead

949

00:38:54,880 --> 00:38:52,460

to an EV a crew member with the with the

950

00:38:56,620 --> 00:38:54,890

spdm on the end of the station arm the

951  
00:38:58,809 --> 00:38:56,630  
the crew member performs that lube and

952  
00:39:01,630 --> 00:38:58,819  
then the SPD and backs off again you'll

953  
00:39:04,210 --> 00:39:01,640  
get details in the next briefing but EV

954  
00:39:08,589 --> 00:39:04,220  
a to again is estimated at the nominal

955  
00:39:11,559 --> 00:39:08,599  
time of six hours and 30 minutes ok

956  
00:39:13,989 --> 00:39:11,569  
moving on the flight day 8 flight 28 and

957  
00:39:16,059 --> 00:39:13,999  
will be a prep day of course for EBA

958  
00:39:18,309 --> 00:39:16,069  
three occurring the next day we're also

959  
00:39:20,079 --> 00:39:18,319  
going to work in some more off-duty time

960  
00:39:22,479 --> 00:39:20,089  
for the crews will do the tool

961  
00:39:26,680 --> 00:39:22,489  
configuration for EV a 3 and then we'll

962  
00:39:28,839 --> 00:39:26,690  
do EBA 3 procedure review and normally

963  
00:39:30,220 --> 00:39:28,849

on this is the day at which we put the

964

00:39:32,289 --> 00:39:30,230

crew in the airlock for what i call the

965

00:39:34,870 --> 00:39:32,299

campout protocol which is what we did on

966

00:39:38,670 --> 00:39:34,880

EBA is one and two for flight day eight

967

00:39:41,650 --> 00:39:38,680

we are testing out or trying out a new

968

00:39:43,269 --> 00:39:41,660

pre-breathe protocol what it's referred

969

00:39:46,239 --> 00:39:43,279

to as the insuit light exercise

970

00:39:49,120 --> 00:39:46,249

pre-breathe protocol or aisle for short

971

00:39:50,920 --> 00:39:49,130

is le and the difference with this

972

00:39:53,229 --> 00:39:50,930

protocol is that it doesn't require the

973

00:39:55,479 --> 00:39:53,239

overnight campout that I described for

974

00:39:57,849 --> 00:39:55,489

EV a's one and two and that were used

975

00:40:00,519 --> 00:39:57,859

for most of the previous ebas on the

976

00:40:03,020 --> 00:40:00,529

last several flights so you know in

977

00:40:05,450 --> 00:40:03,030

terms of complexity in terms of

978

00:40:07,520 --> 00:40:05,460

the quality of life of the crew this out

979

00:40:09,620 --> 00:40:07,530

protocol is a is a pretty significant

980

00:40:11,450 --> 00:40:09,630

upgrade because we don't have we don't

981

00:40:13,160 --> 00:40:11,460

have that point the night before where

982

00:40:14,540 --> 00:40:13,170

the where the 2 eb a crew has to go in

983

00:40:15,800 --> 00:40:14,550

the airlock and we shut the hatch and

984

00:40:18,410 --> 00:40:15,810

they're forced to spend the night over

985

00:40:20,780 --> 00:40:18,420

lot overnight in the airlock with this

986

00:40:23,000 --> 00:40:20,790

in suit light exercise or I'll protocol

987

00:40:24,530 --> 00:40:23,010

the night before the EV a looks exactly

988

00:40:26,990 --> 00:40:24,540

like any other night during the mission

989

00:40:30,350 --> 00:40:27,000

they wake up they don't have to stay on

990

00:40:32,060 --> 00:40:30,360

the portable breathing apparatuses they

991

00:40:33,650 --> 00:40:32,070

don't have to stay on the oxygen masks

992

00:40:38,030 --> 00:40:33,660

so up into the point where they actually

993

00:40:41,240 --> 00:40:38,040

begin the EV a prep on the morning of it

994

00:40:42,680 --> 00:40:41,250

looks just like any other day the other

995

00:40:44,420 --> 00:40:42,690

issue that some of you folks may be

996

00:40:45,950 --> 00:40:44,430

familiar with is that during camp out

997

00:40:47,900 --> 00:40:45,960

when we have the airlock at ten to

998

00:40:49,840 --> 00:40:47,910

there's failures on the station that can

999

00:40:53,000 --> 00:40:49,850

automatically repressurize the airlock

1000

00:40:54,530 --> 00:40:53,010

and we've had that occur at least once

1001  
00:40:56,690 --> 00:40:54,540  
probably more than that on previous

1002  
00:40:58,100 --> 00:40:56,700  
missions with this into light exercise

1003  
00:41:01,220 --> 00:40:58,110  
protocol you're not exposed to that

1004  
00:41:03,800 --> 00:41:01,230  
because the the spacewalk and crew is

1005  
00:41:05,960 --> 00:41:03,810  
that a normal normal pressure going

1006  
00:41:08,690 --> 00:41:05,970  
through their normal routine so we think

1007  
00:41:10,430 --> 00:41:08,700  
this is an improvement we think this is

1008  
00:41:13,790 --> 00:41:10,440  
an improvement over the campout protocol

1009  
00:41:16,160 --> 00:41:13,800  
and of course you know the main thing

1010  
00:41:18,080 --> 00:41:16,170  
we're after here is crew safety we're

1011  
00:41:20,890 --> 00:41:18,090  
trying to all of these protocols are

1012  
00:41:24,500 --> 00:41:20,900  
designed to prevent the bends so

1013  
00:41:26,030 --> 00:41:24,510

previous of course leading up to this we

1014

00:41:28,100 --> 00:41:26,040

put the I'll protocol through all the

1015

00:41:30,320 --> 00:41:28,110

standard medical reviews and tests that

1016

00:41:32,360 --> 00:41:30,330

both the campout and the exercise

1017

00:41:34,580 --> 00:41:32,370

pre-breathe protocols have been

1018

00:41:35,840 --> 00:41:34,590

subjected to subjected to and

1019

00:41:38,600 --> 00:41:35,850

everybody's comfortable that it's

1020

00:41:40,280 --> 00:41:38,610

completely safe and we think it offers

1021

00:41:44,780 --> 00:41:40,290

some significant advantages over the

1022

00:41:48,710 --> 00:41:44,790

campout protocol so flight day flight

1023

00:41:51,080 --> 00:41:48,720

day nine will be drew Feustel and Mike

1024

00:41:54,320 --> 00:41:51,090

Fink performing the EBA EBA number three

1025

00:41:55,820 --> 00:41:54,330

and we'll have Mike excuse me Greg shama

1026

00:41:59,330 --> 00:41:55,830

Tov inside the space station

1027

00:42:02,060 --> 00:41:59,340

orchestrating the EBA as the IV or I be

1028

00:42:04,520 --> 00:42:02,070

a crew member the primary objectives on

1029

00:42:07,610 --> 00:42:04,530

a VA number three or first to take a

1030

00:42:10,820 --> 00:42:07,620

power data grapple fixture or PDGF which

1031

00:42:13,010 --> 00:42:10,830

is but is the base from which the

1032

00:42:15,440 --> 00:42:13,020

station robotic arm operates we're going

1033

00:42:16,849 --> 00:42:15,450

to take a PDGF from the spare PDGF from

1034

00:42:18,529 --> 00:42:16,859

the US side of the space station

1035

00:42:20,479 --> 00:42:18,539

we're going to translate that hardware

1036

00:42:22,579 --> 00:42:20,489

to the FGB and we're going to install

1037

00:42:25,370 --> 00:42:22,589

that power data grapple fixture on the

1038

00:42:27,109 --> 00:42:25,380

FGB in addition to the structural

1039

00:42:30,229 --> 00:42:27,119

installation we'll do a power and data

1040

00:42:33,440 --> 00:42:30,239

installation so that that fgb PDGF will

1041

00:42:34,999 --> 00:42:33,450

be as functional as as the grapple

1042

00:42:37,789 --> 00:42:35,009

fixtures on other places on the US

1043

00:42:39,769 --> 00:42:37,799

segment once that task is complete we'll

1044

00:42:43,609 --> 00:42:39,779

have at least the option in the future

1045

00:42:46,700 --> 00:42:43,619

to use the station robotic arm based on

1046

00:42:50,569 --> 00:42:46,710

the FGB for any task that may be

1047

00:42:54,620 --> 00:42:50,579

required in the future second major

1048

00:42:56,989 --> 00:42:54,630

objective on EV a3 is the rewiring of

1049

00:42:59,420 --> 00:42:56,999

some of the external cables that route

1050

00:43:01,420 --> 00:42:59,430

power from the US segment to the Russian

1051  
00:43:03,559 --> 00:43:01,430  
segment I mean we've had the capability

1052  
00:43:05,809 --> 00:43:03,569  
basically from the beginning of station

1053  
00:43:08,329 --> 00:43:05,819  
to route extra power not required on the

1054  
00:43:10,309 --> 00:43:08,339  
on the US side to the Russian side in

1055  
00:43:12,680 --> 00:43:10,319  
order to augment their their capability

1056  
00:43:15,710 --> 00:43:12,690  
their power produced by their arrays as

1057  
00:43:17,720 --> 00:43:15,720  
it exists today the the wiring and the

1058  
00:43:19,670 --> 00:43:17,730  
channelization is not optimal in the de

1059  
00:43:21,710 --> 00:43:19,680  
single failure on the US side can have a

1060  
00:43:23,599 --> 00:43:21,720  
significant impact on on the Russian

1061  
00:43:27,440 --> 00:43:23,609  
segment what we're doing on EV a3 is

1062  
00:43:29,299 --> 00:43:27,450  
rewiring that connection such that we're

1063  
00:43:30,589 --> 00:43:29,309

not as susceptible to failures in other

1064

00:43:32,509 --> 00:43:30,599

words we can have a failure on the US

1065

00:43:35,210 --> 00:43:32,519

side and the impacts on the Russian side

1066

00:43:37,130 --> 00:43:35,220

will be significantly minimized so

1067

00:43:39,529 --> 00:43:37,140

that's it's an enhancement but it's a

1068

00:43:40,849 --> 00:43:39,539

significant improvement and it it

1069

00:43:44,450 --> 00:43:40,859

improves our ability to withstand

1070

00:43:45,950 --> 00:43:44,460

failures in the future let's see and

1071

00:43:49,479 --> 00:43:45,960

that those are the two major objectives

1072

00:43:53,420 --> 00:43:49,489

ani ba three in again nominal 630

1073

00:43:55,039 --> 00:43:53,430

duration on EV a three and one other

1074

00:43:59,029 --> 00:43:55,049

comment on the Institute light exercise

1075

00:44:01,339 --> 00:43:59,039

protocol the plan the plan is to use it

1076  
00:44:02,269 --> 00:44:01,349  
for EV a three and then at the end of

1077  
00:44:04,279 --> 00:44:02,279  
the day we're going to have a

1078  
00:44:05,870 --> 00:44:04,289  
conversation with the crew and also a

1079  
00:44:07,849 --> 00:44:05,880  
tag up with the flight controllers to

1080  
00:44:09,620 --> 00:44:07,859  
talk about how it went were there any

1081  
00:44:12,380 --> 00:44:09,630  
surprises where was there anything that

1082  
00:44:15,019 --> 00:44:12,390  
didn't work as we expected is there a

1083  
00:44:17,420 --> 00:44:15,029  
reason not to go do it for ev a four if

1084  
00:44:20,059 --> 00:44:17,430  
everything turns out well if there were

1085  
00:44:22,220 --> 00:44:20,069  
no surprises no issues i encountered the

1086  
00:44:24,470 --> 00:44:22,230  
plan will be to use that in suit light

1087  
00:44:27,200 --> 00:44:24,480  
exercise protocol for EV a four as well

1088  
00:44:28,729 --> 00:44:27,210

if there were surprises or the things

1089

00:44:29,499 --> 00:44:28,739

we're not comfortable with we'll just

1090

00:44:32,699 --> 00:44:29,509

download

1091

00:44:34,779 --> 00:44:32,709

to the campout protocol for ev a for

1092

00:44:38,819 --> 00:44:34,789

that takes us through flight day nine

1093

00:44:41,139 --> 00:44:38,829

moving on a flight date 10 we are as

1094

00:44:44,709 --> 00:44:41,149

probably many of you know we're leaving

1095

00:44:46,779 --> 00:44:44,719

the OB SS or the boom on station for

1096

00:44:48,339 --> 00:44:46,789

during this mission so because we're

1097

00:44:50,379 --> 00:44:48,349

doing that the orbiter needs to do their

1098

00:44:53,229 --> 00:44:50,389

late inspection that they normally do

1099

00:44:54,879 --> 00:44:53,239

post undock during the docking period

1100

00:44:57,189 --> 00:44:54,889

flight day 10 as they were going to do

1101

00:45:00,489 --> 00:44:57,199

that and I'll hand back to Gary to talk

1102

00:45:02,649 --> 00:45:00,499

about the details that okay so we'll go

1103

00:45:05,589 --> 00:45:02,659

into a dock light inspection on on this

1104

00:45:08,319 --> 00:45:05,599

flight day and we have done this once

1105

00:45:09,539 --> 00:45:08,329

before back on SCS 123 of course the

1106

00:45:14,199 --> 00:45:09,549

space station was in different

1107

00:45:15,999 --> 00:45:14,209

configuration back then so you see the

1108

00:45:18,789 --> 00:45:16,009

animation going on here where you can

1109

00:45:21,789 --> 00:45:18,799

see the gem module right above the

1110

00:45:23,409 --> 00:45:21,799

shoulder of the shuttle arm and some of

1111

00:45:25,479 --> 00:45:23,419

the other station components kind of

1112

00:45:28,269 --> 00:45:25,489

constrained the space we have to work in

1113

00:45:30,099 --> 00:45:28,279

so this is a unique trajectory and

1114

00:45:32,979 --> 00:45:30,109

procedure to do this we actually did

1115

00:45:35,739 --> 00:45:32,989

execute this on orbit on sts-131 due to

1116

00:45:38,109 --> 00:45:35,749

their ke band antenna failure so we have

1117

00:45:39,519 --> 00:45:38,119

run it on orbit will be flying the arm

1118

00:45:41,249 --> 00:45:39,529

in exactly the same way as we did on

1119

00:45:44,889 --> 00:45:41,259

that mission we have made a couple

1120

00:45:46,719 --> 00:45:44,899

improvements with camera views etc but

1121

00:45:49,959 --> 00:45:46,729

otherwise this will be a second time

1122

00:45:52,059 --> 00:45:49,969

we're running this procedure so we got

1123

00:45:57,489 --> 00:45:52,069

part of the starboard wing taken care of

1124

00:46:04,299 --> 00:45:57,499

here you see the nose cap and then we

1125

00:46:06,339 --> 00:46:04,309

come on over to the port wing and it

1126  
00:46:08,229 --> 00:46:06,349  
turns out this this procedure and data

1127  
00:46:10,659 --> 00:46:08,239  
collection is very very close to the

1128  
00:46:12,279 --> 00:46:10,669  
capability that we have on both flight

1129  
00:46:14,169 --> 00:46:12,289  
day 2 and the nominal undock late

1130  
00:46:15,669 --> 00:46:14,179  
inspection but with some of the

1131  
00:46:17,469 --> 00:46:15,679  
constraints of this base station

1132  
00:46:20,049 --> 00:46:17,479  
hardware we are going to be just a

1133  
00:46:22,419 --> 00:46:20,059  
little bit shy but we normally get but

1134  
00:46:24,459 --> 00:46:22,429  
again the data on sts-131 was very good

1135  
00:46:25,719 --> 00:46:24,469  
and team was very pleased with the

1136  
00:46:29,189 --> 00:46:25,729  
results so we'll be doing that again

1137  
00:46:31,899 --> 00:46:29,199  
here it's back to you dirt okay

1138  
00:46:34,379 --> 00:46:31,909

continuing on with the flight date and

1139

00:46:36,339 --> 00:46:34,389

activities we're going to do

1140

00:46:38,559 --> 00:46:36,349

preparations for a be a four-course

1141

00:46:39,909 --> 00:46:38,569

standard pre DBA stuff we're going to

1142

00:46:42,339 --> 00:46:39,919

get the tools configured we're going to

1143

00:46:43,510 --> 00:46:42,349

get the procedures reviewed and the

1144

00:46:47,410 --> 00:46:43,520

spacewalkers 4e

1145

00:46:49,540 --> 00:46:47,420

a four will be back to Mike Fink a CBE

1146

00:46:52,330 --> 00:46:49,550

one so this will be his first shot at

1147

00:46:56,650 --> 00:46:52,340

eb1 and he'll be executing a TBA for

1148

00:46:58,720 --> 00:46:56,660

with Greg shamba Tov moving on to flight

1149

00:47:01,840 --> 00:46:58,730

day 11 early in the day we're going to

1150

00:47:03,640 --> 00:47:01,850

do the handoff hand off the OBS s from

1151  
00:47:05,760 --> 00:47:03,650  
the station onto the shuttle arm I've

1152  
00:47:08,170 --> 00:47:05,770  
got some video here that shows that and

1153  
00:47:10,480 --> 00:47:08,180  
greg johnson and Cady Coleman will be

1154  
00:47:12,010 --> 00:47:10,490  
operating the station arm and they'll

1155  
00:47:16,510 --> 00:47:12,020  
maneuver to a point where they can

1156  
00:47:22,690 --> 00:47:16,520  
grapple the OBS S on the grapple fixture

1157  
00:47:25,060 --> 00:47:22,700  
basically in the center of the boom once

1158  
00:47:26,850 --> 00:47:25,070  
the OBS s is grappled by the station arm

1159  
00:47:29,890 --> 00:47:26,860  
the shuttle arm will back off and then

1160  
00:47:33,520 --> 00:47:29,900  
move to a maneuver to a viewing position

1161  
00:47:36,520 --> 00:47:33,530  
and the goal here is that is to maneuver

1162  
00:47:39,000 --> 00:47:36,530  
the OBS S on the station arm to a point

1163  
00:47:42,220 --> 00:47:39,010

near enough to the s-1 trust that the

1164

00:47:44,350 --> 00:47:42,230

spacewalkers can then take the arm or

1165

00:47:46,330 --> 00:47:44,360

take the boom from the station arm and

1166

00:47:49,270 --> 00:47:46,340

then install it on the s-1 trust and

1167

00:47:53,470 --> 00:47:49,280

again that in terms of major objectives

1168

00:47:56,410 --> 00:47:53,480

for this EBA the goal is to stow the OBS

1169

00:47:59,010 --> 00:47:56,420

S on the station trust on the s-1 trust

1170

00:48:02,200 --> 00:47:59,020

the reason we're doing that is because

1171

00:48:05,530 --> 00:48:02,210

we can use the OBS s to significantly

1172

00:48:08,830 --> 00:48:05,540

extend the station arm reach and folks

1173

00:48:10,570 --> 00:48:08,840

who are familiar with sts 120 and the

1174

00:48:12,670 --> 00:48:10,580

solar array repair that we ended up

1175

00:48:14,890 --> 00:48:12,680

doing on ebay for know that that that's

1176

00:48:17,440 --> 00:48:14,900

one of the we use the OBS S on the

1177

00:48:19,390 --> 00:48:17,450

station arm to get para jet ski out

1178

00:48:21,550 --> 00:48:19,400

close enough to actually install the

1179

00:48:23,380 --> 00:48:21,560

cufflinks and repair the tear in the

1180

00:48:26,260 --> 00:48:23,390

solar array so that was a real world

1181

00:48:28,090 --> 00:48:26,270

example of how the OBS s can be used in

1182

00:48:30,640 --> 00:48:28,100

order to extend the reach of the soul of

1183

00:48:33,340 --> 00:48:30,650

the station arm and get spacewalking

1184

00:48:35,860 --> 00:48:33,350

astronauts or to get spacewalking

1185

00:48:37,090 --> 00:48:35,870

astronauts two points at the extreme

1186

00:48:39,640 --> 00:48:37,100

ends of the trust that we wouldn't

1187

00:48:42,130 --> 00:48:39,650

otherwise be able to reach another thing

1188

00:48:43,750 --> 00:48:42,140

I'll point out is it on EV a on EV a

1189

00:48:46,660 --> 00:48:43,760

four on the CBA we're actually going to

1190

00:48:49,510 --> 00:48:46,670

be removing the existing grapple fixture

1191

00:48:50,920 --> 00:48:49,520

on the lbs s and we're going to be again

1192

00:48:53,140 --> 00:48:50,930

we're going to be retrieving a spare

1193

00:48:55,030 --> 00:48:53,150

PDGF power data grapple fixture from

1194

00:48:57,339 --> 00:48:55,040

another location on the station we're

1195

00:48:59,829 --> 00:48:57,349

going to install that PDGF on the

1196

00:49:02,229 --> 00:48:59,839

into the OBS s so normally as you saw in

1197

00:49:04,630 --> 00:49:02,239

that in that video the station arm can

1198

00:49:06,579 --> 00:49:04,640

only grapple the OBS s in the center

1199

00:49:08,680 --> 00:49:06,589

which limits the reach once we do the

1200

00:49:12,190 --> 00:49:08,690

work that we plan for this EBA will have

1201

00:49:14,469 --> 00:49:12,200

a PDGF on the on the end of the OBS s so

1202

00:49:19,960 --> 00:49:14,479

you get the maximum benefit of having

1203

00:49:22,239 --> 00:49:19,970

the OBS s available to you and let's see

1204

00:49:24,130 --> 00:49:22,249

in addition we're going to basically

1205

00:49:25,749 --> 00:49:24,140

some cleanup items at the end of the CVA

1206

00:49:28,120 --> 00:49:25,759

we're going to be taking some some

1207

00:49:31,359 --> 00:49:28,130

photos of the work that we did on the

1208

00:49:33,430 --> 00:49:31,369

FGB PDGF and also some photos of the FGB

1209

00:49:37,660 --> 00:49:33,440

thrusters that have been requested by

1210

00:49:39,789 --> 00:49:37,670

our Russian colleagues and that that

1211

00:49:46,569 --> 00:49:39,799

will close out the EBA activities for

1212

00:49:49,059 --> 00:49:46,579

the flight okay flight day 12 we resumed

1213

00:49:51,450 --> 00:49:49,069

transfer activities we do a standard

1214

00:49:53,829 --> 00:49:51,460

rendezvous rendezvous tools check out

1215

00:49:55,269 --> 00:49:53,839

for the on the orbiter side we do a

1216

00:49:56,469 --> 00:49:55,279

joint news conference with the crew and

1217

00:49:59,259 --> 00:49:56,479

then we have the farewell and hatch

1218

00:50:03,249 --> 00:49:59,269

closure and a couple of comments before

1219

00:50:04,809 --> 00:50:03,259

I hand back to Gary in parallel to all

1220

00:50:07,539 --> 00:50:04,819

the activities that I described here I

1221

00:50:09,339 --> 00:50:07,549

hit mostly on the EVs and the robotics

1222

00:50:11,499 --> 00:50:09,349

but in parallel to these activities were

1223

00:50:12,940 --> 00:50:11,509

going to be doing transfer transferring

1224

00:50:15,279 --> 00:50:12,950

the items from the shuttle mid deck that

1225

00:50:17,019 --> 00:50:15,289

we brought up to the station the other

1226  
00:50:20,859 --> 00:50:17,029  
thing that we're working real hard on on

1227  
00:50:23,650 --> 00:50:20,869  
this mission is to get ahead on tasks

1228  
00:50:27,819 --> 00:50:23,660  
required to support the the next stage

1229  
00:50:29,979 --> 00:50:27,829  
and sts-135 as an example we've got an

1230  
00:50:32,559 --> 00:50:29,989  
ATV attached that has not yet been

1231  
00:50:34,479 --> 00:50:32,569  
completely unloaded so we're going to do

1232  
00:50:36,999 --> 00:50:34,489  
our best to get as much of that

1233  
00:50:38,950 --> 00:50:37,009  
unpacking done as practical we've also

1234  
00:50:41,769 --> 00:50:38,960  
got some work that's required on the

1235  
00:50:43,509 --> 00:50:41,779  
carbon dioxide removal assembly or sidra

1236  
00:50:47,620 --> 00:50:43,519  
so we're going to we're going to we're

1237  
00:50:49,660 --> 00:50:47,630  
doing everything we can to make the 134

1238  
00:50:50,769 --> 00:50:49,670

crewmembers available to do that work so

1239

00:50:52,839 --> 00:50:50,779

there's going to be a lot of stuff going

1240

00:50:54,999 --> 00:50:52,849

on in parallel to the EBA in the

1241

00:50:57,519 --> 00:50:55,009

robotics that I described and that work

1242

00:50:59,440 --> 00:50:57,529

is absolutely critical to making the

1243

00:51:03,219 --> 00:50:59,450

next stage prior to the Saudis departure

1244

00:51:05,739 --> 00:51:03,229

and the time leading up to 135 work the

1245

00:51:06,999 --> 00:51:05,749

other thing I'll mention is that many of

1246

00:51:09,069 --> 00:51:07,009

you may have heard that there was

1247

00:51:11,020 --> 00:51:09,079

consideration and assessment being done

1248

00:51:15,580 --> 00:51:11,030

for a what we're calling a so you

1249

00:51:17,500 --> 00:51:15,590

fly about that was done on 133 a lot of

1250

00:51:19,270 --> 00:51:17,510

the analysis was done of the station

1251  
00:51:20,860 --> 00:51:19,280  
attitude Ricard and the trajectory we

1252  
00:51:23,230 --> 00:51:20,870  
put together a basic timeline and what

1253  
00:51:24,910 --> 00:51:23,240  
that would look look like in the end

1254  
00:51:27,670 --> 00:51:24,920  
they decided they weren't quite ready to

1255  
00:51:31,720 --> 00:51:27,680  
do that on 133 we have been asked to

1256  
00:51:34,090 --> 00:51:31,730  
look at that same thing for sts-134 is

1257  
00:51:35,590 --> 00:51:34,100  
my expectation is the station attitude

1258  
00:51:39,130 --> 00:51:35,600  
to be very similar that the Soyuz

1259  
00:51:41,290 --> 00:51:39,140  
trajectory would be very similar that

1260  
00:51:42,820 --> 00:51:41,300  
the objectives will be the same we'll

1261  
00:51:44,290 --> 00:51:42,830  
probably have a video camera inside the

1262  
00:51:47,320 --> 00:51:44,300  
Soyuz will probably and will have

1263  
00:51:49,720 --> 00:51:47,330

multiple cameras and the intent there is

1264

00:51:52,270 --> 00:51:49,730

the photo document that the external of

1265

00:51:53,800 --> 00:51:52,280

the station and you know with the

1266

00:51:55,060 --> 00:51:53,810

shuttle flights wind and down this being

1267

00:51:58,120 --> 00:51:55,070

the second to last one this just

1268

00:52:00,490 --> 00:51:58,130

represents a unique opportunity to get

1269

00:52:02,170 --> 00:52:00,500

photo documentation of the entire

1270

00:52:04,780 --> 00:52:02,180

configuration with with the shuttle an

1271

00:52:07,840 --> 00:52:04,790

attached so that's something you'll

1272

00:52:11,950 --> 00:52:07,850

you'll hear more about as we finalize

1273

00:52:13,540 --> 00:52:11,960

the plans and look at the details at a

1274

00:52:15,970 --> 00:52:13,550

high level what we would plan to do is

1275

00:52:17,980 --> 00:52:15,980

use that plus one day that Gary

1276

00:52:19,930 --> 00:52:17,990

discussed you mentioned that we had a 14

1277

00:52:21,760 --> 00:52:19,940

plus one day mission we'd insert that

1278

00:52:24,040 --> 00:52:21,770

plus one day in order to provide some

1279

00:52:25,780 --> 00:52:24,050

margin to support this activity and I

1280

00:52:28,540 --> 00:52:25,790

would expect the Saudis fly about to be

1281

00:52:30,280 --> 00:52:28,550

done later in the mission rather than

1282

00:52:32,080 --> 00:52:30,290

earlier you know it's something on the

1283

00:52:34,090 --> 00:52:32,090

order of flight day 12 13 we haven't

1284

00:52:35,530 --> 00:52:34,100

finalized what that day would be but

1285

00:52:38,200 --> 00:52:35,540

that's kind of what we're working

1286

00:52:39,880 --> 00:52:38,210

towards we've asked our Russian

1287

00:52:42,730 --> 00:52:39,890

colleagues to look at this as well and

1288

00:52:44,950 --> 00:52:42,740

of course we need their approval and

1289

00:52:47,080 --> 00:52:44,960

their their final agreement to go do

1290

00:52:48,370 --> 00:52:47,090

this before we would put finish the

1291

00:52:50,650 --> 00:52:48,380

details of the planning but I just

1292

00:52:53,530 --> 00:52:50,660

wanted to give folks a heads up to

1293

00:52:55,540 --> 00:52:53,540

that's something we're looking at and

1294

00:52:57,160 --> 00:52:55,550

with that I'll hand back to Gary to take

1295

00:53:00,520 --> 00:52:57,170

you through flight 812 when the rest of

1296

00:53:03,220 --> 00:53:00,530

the mission okay thanks Derek so we're

1297

00:53:04,420 --> 00:53:03,230

still on a hatch closure day go ahead we

1298

00:53:06,160 --> 00:53:04,430

already talked about the two big

1299

00:53:07,990 --> 00:53:06,170

payloads that we've we've transferred

1300

00:53:10,840 --> 00:53:08,000

from the payload Bay over to the space

1301  
00:53:13,870 --> 00:53:10,850  
station there each just over 15,000

1302  
00:53:15,430 --> 00:53:13,880  
pounds each so greater than 30,000

1303  
00:53:17,650 --> 00:53:15,440  
pounds of cargo that would transfer it

1304  
00:53:19,690 --> 00:53:17,660  
externally the shuttle mid decks got

1305  
00:53:21,820 --> 00:53:19,700  
well over 8,000 pounds of internal cargo

1306  
00:53:23,980 --> 00:53:21,830  
that were transferring over to the space

1307  
00:53:24,849 --> 00:53:23,990  
station during the mission and this of

1308  
00:53:26,229 --> 00:53:24,859  
course is our last

1309  
00:53:28,630 --> 00:53:26,239  
make sure we get the right cargo on the

1310  
00:53:30,069 --> 00:53:28,640  
right side of the hatch we're also

1311  
00:53:32,529 --> 00:53:30,079  
bringing back quite a bit of cargo from

1312  
00:53:34,479 --> 00:53:32,539  
station back down to the ground as well

1313  
00:53:36,039 --> 00:53:34,489

so we'll be making sure we get all that

1314

00:53:38,799 --> 00:53:36,049

accomplished there before we close

1315

00:53:42,370 --> 00:53:38,809

hatches at the end of the day and we'll

1316

00:53:44,829 --> 00:53:42,380

also get the the runnable tools and and

1317

00:53:46,390 --> 00:53:44,839

those type activities checked out in

1318

00:53:49,210 --> 00:53:46,400

preparation for the undock in the next

1319

00:53:52,539 --> 00:53:49,220

morning so that takes us to flight day

1320

00:53:54,809 --> 00:53:52,549

13 which is undocking day and fly around

1321

00:53:57,940 --> 00:53:54,819

as well as the storm we rendezvous day

1322

00:54:01,239 --> 00:53:57,950

so we have a we have a video to depict

1323

00:54:03,339 --> 00:54:01,249

some of those operations orbital will

1324

00:54:05,019 --> 00:54:03,349

back away undock and back away and do a

1325

00:54:08,589 --> 00:54:05,029

full one lap fly around like we normally

1326  
00:54:12,249 --> 00:54:08,599  
do and it will do the nominal step one

1327  
00:54:13,930 --> 00:54:12,259  
burn right there and then the SEP to

1328  
00:54:15,460 --> 00:54:13,940  
burn will put us on the storm we

1329  
00:54:17,859 --> 00:54:15,470  
rendezvous trajectory so we're going to

1330  
00:54:21,819 --> 00:54:17,869  
phase out above station and behind it

1331  
00:54:23,229 --> 00:54:21,829  
and storm will be taking data all the

1332  
00:54:27,069 --> 00:54:23,239  
way out to the sensors drop block

1333  
00:54:30,460 --> 00:54:27,079  
outside 20,000 feet and then we'll go

1334  
00:54:31,660 --> 00:54:30,470  
ahead and do a orbit lowering burn out

1335  
00:54:34,329 --> 00:54:31,670  
here which is going to bring us down

1336  
00:54:36,400 --> 00:54:34,339  
below the space station and get a set up

1337  
00:54:40,450 --> 00:54:36,410  
for the trajectory to mimic the Orion

1338  
00:54:42,279 --> 00:54:40,460

approach to the space station and this

1339

00:54:43,930 --> 00:54:42,289

this approach is called a co Olympic

1340

00:54:45,849 --> 00:54:43,940

approach so this burned down here is

1341

00:54:47,880 --> 00:54:45,859

going to put us in a CO Olympic

1342

00:54:50,349 --> 00:54:47,890

trajectory under the space station and

1343

00:54:53,890 --> 00:54:50,359

then we'll be catching back up to it and

1344

00:54:55,420 --> 00:54:53,900

do the terminal phase initiation burn

1345

00:54:57,220 --> 00:54:55,430

which will bring us back up towards

1346

00:54:59,140 --> 00:54:57,230

station and it's designed to have a

1347

00:55:01,509 --> 00:54:59,150

stall out at about a thousand feet below

1348

00:55:04,420 --> 00:55:01,519

and 300 feet behind the space station

1349

00:55:06,910 --> 00:55:04,430

and then orbital mechanics will pull us

1350

00:55:08,620 --> 00:55:06,920

down in a way storm sensors will

1351  
00:55:11,349 --> 00:55:08,630  
continue to take data until the sensors

1352  
00:55:14,259 --> 00:55:11,359  
drop block and when we get outside that

1353  
00:55:16,089 --> 00:55:14,269  
range will we'll go ahead and call the

1354  
00:55:17,950 --> 00:55:16,099  
doc mission complete and then we'll

1355  
00:55:21,370 --> 00:55:17,960  
start would get our normal water dumps

1356  
00:55:25,450 --> 00:55:21,380  
accomplished and get ready to to get the

1357  
00:55:27,509 --> 00:55:25,460  
ship prepared to come back home so that

1358  
00:55:29,890 --> 00:55:27,519  
takes the flight day 14 which is the

1359  
00:55:31,690 --> 00:55:29,900  
nominal landing minus one day activities

1360  
00:55:33,880 --> 00:55:31,700  
entry team will come in they'll do the

1361  
00:55:35,109 --> 00:55:33,890  
flight control system check out make

1362  
00:55:37,750 --> 00:55:35,119  
sure all those systems are ready to

1363  
00:55:40,180 --> 00:55:37,760

support the entry the following day

1364

00:55:41,350 --> 00:55:40,190

to the ration control system jet firings

1365

00:55:43,180 --> 00:55:41,360

make sure all the Jets are ready to

1366

00:55:45,400 --> 00:55:43,190

support the entry and then of course

1367

00:55:47,290 --> 00:55:45,410

we'll be doing all the internal cabin

1368

00:55:50,370 --> 00:55:47,300

Stowe and and reconfiguring to get ready

1369

00:55:53,170 --> 00:55:50,380

to to do an entry with the spacecraft

1370

00:55:55,420 --> 00:55:53,180

and then on flight day 15 we'll wrap up

1371

00:55:57,250 --> 00:55:55,430

the mission with a deorbit prep and

1372

00:56:00,670 --> 00:55:57,260

final landing of endeavor hopefully at

1373

00:56:03,370 --> 00:56:00,680

Kennedy Space Center and with that we'll

1374

00:56:06,550 --> 00:56:03,380

be wrapping up a very challenging and

1375

00:56:08,440 --> 00:56:06,560

very very successful mission hopefully

1376

00:56:10,750 --> 00:56:08,450

and like like we talked about we got

1377

00:56:12,550 --> 00:56:10,760

quite a few first on this flight really

1378

00:56:14,530 --> 00:56:12,560

excited to be part of this and have the

1379

00:56:17,740 --> 00:56:14,540

opportunity to take a ms to its final

1380

00:56:20,200 --> 00:56:17,750

location do storm activities for the

1381

00:56:22,510 --> 00:56:20,210

Orion program and just out a new

1382

00:56:25,030 --> 00:56:22,520

pre-breathe protocol that abused for the

1383

00:56:26,350 --> 00:56:25,040

rest of the life on Space Station so we

1384

00:56:28,990 --> 00:56:26,360

got a lot going on and really looking

1385

00:56:30,730 --> 00:56:29,000

forward to it and I think that's all we

1386

00:56:33,160 --> 00:56:30,740

got Kelly will be really take any

1387

00:56:35,680 --> 00:56:33,170

questions folks might have thanks Kari

1388

00:56:37,810 --> 00:56:35,690

and thanks Derek will move ahead to the

1389

00:56:39,760 --> 00:56:37,820

questions please do remember to repeat

1390

00:56:41,560 --> 00:56:39,770

your name and your affiliation before

1391

00:56:44,260 --> 00:56:41,570

your question and we're out in the back

1392

00:56:46,360 --> 00:56:44,270

row with mark I think some are kuro for

1393

00:56:49,030 --> 00:56:46,370

a vacation week I have a couple of storm

1394

00:56:51,670 --> 00:56:49,040

questions and the first one is when you

1395

00:56:55,930 --> 00:56:51,680

undock and then we rendezvous how long

1396

00:56:58,330 --> 00:56:55,940

will that exercise last okay I

1397

00:57:00,520 --> 00:56:58,340

understand the question is a approximate

1398

00:57:03,520 --> 00:57:00,530

time the duration will take from undock

1399

00:57:05,980 --> 00:57:03,530

to the cult the closest approach back to

1400

00:57:07,240 --> 00:57:05,990

space station I know the exact time off

1401

00:57:11,290 --> 00:57:07,250

top my head but it's on the order of

1402

00:57:12,520 --> 00:57:11,300

about three hours and 40 minutes and if

1403

00:57:15,610 --> 00:57:12,530

you need the exact number i can get i

1404

00:57:18,640 --> 00:57:15,620

can get that whole profile for you this

1405

00:57:21,100 --> 00:57:18,650

is a follow-up question now maybe this

1406

00:57:23,500 --> 00:57:21,110

is a little philosophical but this seems

1407

00:57:27,820 --> 00:57:23,510

like sort of a significant test for the

1408

00:57:30,730 --> 00:57:27,830

shuttle to do it's it's always had a

1409

00:57:33,010 --> 00:57:30,740

manual docking regime with the space

1410

00:57:36,880 --> 00:57:33,020

station and if i understand what storm

1411

00:57:40,230 --> 00:57:36,890

does is it gives you in the in the

1412

00:57:42,430 --> 00:57:40,240

future an automated sort of docking

1413

00:57:45,670 --> 00:57:42,440

approach which gives you more

1414

00:57:48,580 --> 00:57:45,680

flexibility on crew complement and and i

1415

00:57:50,860 --> 00:57:48,590

think this thing would even work with

1416

00:57:52,900 --> 00:57:50,870

lunar landing or asteroid run but I'm

1417

00:57:55,060 --> 00:57:52,910

not quite sure on all the capabilities

1418

00:57:58,660 --> 00:57:55,070

but it really seems to open some doors

1419

00:58:00,190 --> 00:57:58,670

and I just wonder what you're thinking

1420

00:58:03,610 --> 00:58:00,200

what your thoughts are on the

1421

00:58:06,400 --> 00:58:03,620

significance of of handing this off from

1422

00:58:10,360 --> 00:58:06,410

the shuttle to the future space grant

1423

00:58:13,210 --> 00:58:10,370

Thanks yeah mark i think i think it's a

1424

00:58:15,720 --> 00:58:13,220

it's a outstanding way to take advantage

1425

00:58:18,430 --> 00:58:15,730

of the space flight capabilities we have

1426  
00:58:20,410 --> 00:58:18,440  
today that both the shuttle in the space

1427  
00:58:22,390 --> 00:58:20,420  
station to like i said demonstrate new

1428  
00:58:24,220 --> 00:58:22,400  
technologies that will be used for all

1429  
00:58:26,590 --> 00:58:24,230  
future spacecraft and this this

1430  
00:58:30,610 --> 00:58:26,600  
capability will it is being designed for

1431  
00:58:32,560 --> 00:58:30,620  
Orion but it is absolutely very

1432  
00:58:33,820 --> 00:58:32,570  
applicable to any any spacecraft that

1433  
00:58:38,080 --> 00:58:33,830  
will be doing doc and like you said in

1434  
00:58:40,140 --> 00:58:38,090  
lunar orbit or Mars orbit anywhere so to

1435  
00:58:42,910 --> 00:58:40,150  
me it's it's a very significant

1436  
00:58:45,070 --> 00:58:42,920  
progression of advancing technologies

1437  
00:58:46,900 --> 00:58:45,080  
for future applications so I'm very

1438  
00:58:53,350 --> 00:58:46,910

excited to be able to do this on this

1439

00:58:57,670 --> 00:58:53,360

flight Phillips loss with NASA Space

1440

00:58:59,560 --> 00:58:57,680

Flight calm also on storm how how is

1441

00:59:01,930 --> 00:58:59,570

that going to the choreography going to

1442

00:59:03,700 --> 00:59:01,940

work on the rear on da vu is are you

1443

00:59:05,830 --> 00:59:03,710

going to be doing burn targeting in the

1444

00:59:07,750 --> 00:59:05,840

on the ground are you going to be using

1445

00:59:09,640 --> 00:59:07,760

the storm sensors to targeting or are

1446

00:59:12,160 --> 00:59:09,650

you going to be using orbiter the normal

1447

00:59:15,310 --> 00:59:12,170

orbit or assets to do that it's a great

1448

00:59:18,100 --> 00:59:15,320

question the storm system is not is not

1449

00:59:19,570 --> 00:59:18,110

integrated into the vehicle into the

1450

00:59:21,750 --> 00:59:19,580

shuttle vehicles so none of that

1451  
00:59:24,190 --> 00:59:21,760  
information can get into the targeting

1452  
00:59:25,930 --> 00:59:24,200  
capabilities of the shuttle so they're

1453  
00:59:28,150 --> 00:59:25,940  
going to be basically operating

1454  
00:59:30,010 --> 00:59:28,160  
separately from the orbiter they'll be

1455  
00:59:31,750 --> 00:59:30,020  
collecting data and and they'll be able

1456  
00:59:34,240 --> 00:59:31,760  
to analyze that after we get it back

1457  
00:59:35,650 --> 00:59:34,250  
from the mission the orbiter will

1458  
00:59:37,720 --> 00:59:35,660  
utilize its standard suite of

1459  
00:59:41,980 --> 00:59:37,730  
capabilities so the run of the radar

1460  
00:59:43,420 --> 00:59:41,990  
system will be our main main sensor on

1461  
00:59:46,180 --> 00:59:43,430  
the orbiter that feeds into the

1462  
00:59:48,970 --> 00:59:46,190  
navigation system and will be used to

1463  
00:59:50,050 --> 00:59:48,980

target the first couple burns I'm sorry

1464

00:59:52,240 --> 00:59:50,060

the first couple burns are going to be

1465

00:59:55,900 --> 00:59:52,250

ground targeted and then once we get

1466

00:59:57,790 --> 00:59:55,910

past the the NH burn we'll start

1467

00:59:59,860 --> 00:59:57,800

targeting the rest of the rendezvous

1468

01:00:01,240 --> 00:59:59,870

maneuvers on board with the with the

1469

01:00:03,340 --> 01:00:01,250

sensors

1470

01:00:05,520 --> 01:00:03,350

from the ka radar and if we need it

1471

01:00:07,990 --> 01:00:05,530

we've got the star trackers as well and

1472

01:00:10,510 --> 01:00:08,000

but we'll be targeting those the

1473

01:00:12,400 --> 01:00:10,520

remainder of the storm burns with our

1474

01:00:16,810 --> 01:00:12,410

standard suite of capabilities on the

1475

01:00:19,240 --> 01:00:16,820

shuttle well the horowitz CVS or three

1476

01:00:21,700 --> 01:00:19,250

quick ones uh one is on storm again what

1477

01:00:23,530 --> 01:00:21,710

is the max range behind ISS before you

1478

01:00:25,540 --> 01:00:23,540

start coming back you said that I just

1479

01:00:27,010 --> 01:00:25,550

missed it yeah bill actually I don't

1480

01:00:28,480 --> 01:00:27,020

think I said the max range but that's a

1481

01:00:30,730 --> 01:00:28,490

great question we're going to again the

1482

01:00:32,560 --> 01:00:30,740

sensors are right around 20,000 feet so

1483

01:00:34,350 --> 01:00:32,570

we need to get outside of that to give

1484

01:00:36,280 --> 01:00:34,360

them an ability to get set up to

1485

01:00:38,380 --> 01:00:36,290

characterize their acquisition

1486

01:00:39,550 --> 01:00:38,390

performance so we're going to the

1487

01:00:42,400 --> 01:00:39,560

trajectory is going to take us right

1488

01:00:44,680 --> 01:00:42,410

around 30,000 feet about 29,000 feet

1489

01:00:46,450 --> 01:00:44,690

behind the space station before we start

1490

01:00:49,810 --> 01:00:46,460

phasing back in underneath and catching

1491

01:00:53,110 --> 01:00:49,820

up to more for me I guess for Derek on

1492

01:00:54,640 --> 01:00:53,120

the Soyuz fly around this has to be Cady

1493

01:00:56,380 --> 01:00:54,650

Coleman screw obviously so they would

1494

01:00:58,390 --> 01:00:56,390

come off of Ross fet I'm assuming and

1495

01:01:00,690 --> 01:00:58,400

they were telling us last time we were

1496

01:01:02,920 --> 01:01:00,700

discussing this when it was a poisk

1497

01:01:04,030 --> 01:01:02,930

departure that you'd want to come off

1498

01:01:05,590 --> 01:01:04,040

the bottom because there was some issue

1499

01:01:07,180 --> 01:01:05,600

with pluming the tail of the orbiter

1500

01:01:09,160 --> 01:01:07,190

while it was dr. it was inside that

1501  
01:01:11,350 --> 01:01:09,170  
envelope so has that been resolved I

1502  
01:01:13,600 --> 01:01:11,360  
assume it has is that switcher we're

1503  
01:01:15,670 --> 01:01:13,610  
actually targeting the ron garan screw

1504  
01:01:18,340 --> 01:01:15,680  
for this for this fly about so they be

1505  
01:01:19,750 --> 01:01:18,350  
they be leaving the zenith Mr import

1506  
01:01:21,070 --> 01:01:19,760  
well then let me ask about that because

1507  
01:01:22,480 --> 01:01:21,080  
I thought you had always used to

1508  
01:01:23,950 --> 01:01:22,490  
departing crew in case something

1509  
01:01:26,290 --> 01:01:23,960  
happened and they couldn't redock you'd

1510  
01:01:28,330 --> 01:01:26,300  
have the outgoing crew that would then

1511  
01:01:31,510 --> 01:01:28,340  
return to Earth in that case why would

1512  
01:01:33,490 --> 01:01:31,520  
you do it this way well it's all driven

1513  
01:01:35,140 --> 01:01:33,500

by what you described it the clearances

1514

01:01:38,200 --> 01:01:35,150

and the trajectory from the zenith

1515

01:01:40,510 --> 01:01:38,210

versus the native ports so ideally you'd

1516

01:01:41,860 --> 01:01:40,520

use the departing crew for what we're

1517

01:01:44,290 --> 01:01:41,870

planning for this mission just because

1518

01:01:47,920 --> 01:01:44,300

the configuration the sois is we would

1519

01:01:51,700 --> 01:01:47,930

use Ron Garan scrub the last question is

1520

01:01:54,250 --> 01:01:51,710

on aisle can you give us a I don't know

1521

01:01:55,840 --> 01:01:54,260

scuba diving depressed bins 101 and

1522

01:01:57,700 --> 01:01:55,850

explain how this works I just I

1523

01:01:59,080 --> 01:01:57,710

understand the campout and how that

1524

01:02:01,480 --> 01:01:59,090

achieves your goal I don't know that I

1525

01:02:03,400 --> 01:02:01,490

understand how I all does it yeah the

1526

01:02:05,380 --> 01:02:03,410

intent of the protocol is exactly that

1527

01:02:07,120 --> 01:02:05,390

are both the campout and the out

1528

01:02:09,220 --> 01:02:07,130

protocol exactly the same as that's the

1529

01:02:11,740 --> 01:02:09,230

Clin clenched the blood and tissues of

1530

01:02:17,300 --> 01:02:15,200

for overnight campout that with the

1531

01:02:19,220 --> 01:02:17,310

crews sleeping in the airlock the the

1532

01:02:21,170 --> 01:02:19,230

reduced pressure helps with that helps

1533

01:02:22,910 --> 01:02:21,180

the you know the efficiency of removing

1534

01:02:24,770 --> 01:02:22,920

nitrogen from the blood and then that

1535

01:02:26,540 --> 01:02:24,780

duration of the campout also helps and

1536

01:02:28,579 --> 01:02:26,550

that the goal is to minimize the time

1537

01:02:31,609 --> 01:02:28,589

that you have to breathe pure oxygen the

1538

01:02:35,450 --> 01:02:31,619

next morning for aisle what we found is

1539

01:02:37,490 --> 01:02:35,460

that just by putting the the the crew in

1540

01:02:39,380 --> 01:02:37,500

the spacesuit after reduced pressure and

1541

01:02:40,819 --> 01:02:39,390

then having to do some minimal amount of

1542

01:02:44,180 --> 01:02:40,829

exercise I should have mentioned that

1543

01:02:46,370 --> 01:02:44,190

light exercise means barely moving in

1544

01:02:48,020 --> 01:02:46,380

this case it's not a leisurely jog or

1545

01:02:50,540 --> 01:02:48,030

anything of that sort it's just

1546

01:02:52,460 --> 01:02:50,550

basically flexing your knees and i think

1547

01:02:55,310 --> 01:02:52,470

alison has a video to show you just how

1548

01:02:57,800 --> 01:02:55,320

light the light exercise is so it's I

1549

01:02:59,270 --> 01:02:57,810

mean the goal of both protocols is to

1550

01:03:01,190 --> 01:02:59,280

get the nitrogen out of the bloodstream

1551

01:03:05,000 --> 01:03:01,200

they just in the accomplish in basically

1552

01:03:06,710 --> 01:03:05,010

the same way by breathing an oxygen-rich

1553

01:03:09,290 --> 01:03:06,720

environment at a low pressure lower

1554

01:03:11,240 --> 01:03:09,300

pressure than ambient but you're able to

1555

01:03:21,470 --> 01:03:11,250

accomplish it quicker using the out

1556

01:03:23,569 --> 01:03:21,480

protocol that makes sense yeah Robert

1557

01:03:25,099 --> 01:03:23,579

since he's closer hi Robert problem with

1558

01:03:27,950 --> 01:03:25,109

collects based calm just with a quick

1559

01:03:29,859 --> 01:03:27,960

question about OBS s the last time you

1560

01:03:32,990 --> 01:03:29,869

stood it on station and left it there it

1561

01:03:35,150 --> 01:03:33,000

the sensors needed to be powered because

1562

01:03:37,099 --> 01:03:35,160

you're going to reuse those sensors is

1563

01:03:39,170 --> 01:03:37,109

am I correct that they're not going to

1564

01:03:41,540 --> 01:03:39,180

be powered this time and they'll just be

1565

01:03:44,120 --> 01:03:41,550

allowed to freeze and die that is

1566

01:03:46,940 --> 01:03:44,130

correct there's there's no provisions on

1567

01:03:50,000 --> 01:03:46,950

the s-1 trust to power the the sensors

1568

01:03:52,930 --> 01:03:50,010

system on OBS s so you know in a matter

1569

01:03:56,599 --> 01:03:52,940

of hours after we install it on on

1570

01:03:57,980 --> 01:03:56,609

station ani ba for the central package

1571

01:04:01,880 --> 01:03:57,990

will have violated thermal limits and

1572

01:04:03,530 --> 01:04:01,890

and it will be assumed to be lost and of

1573

01:04:05,569 --> 01:04:03,540

course there's there's no need for the

1574

01:04:09,050 --> 01:04:05,579

sensor system on station I mean that's

1575

01:04:10,790 --> 01:04:09,060

dedicated to inspection of the TPS but

1576

01:04:13,790 --> 01:04:10,800

but that is a fact last time we left it

1577

01:04:16,790 --> 01:04:13,800

was powered this time it will not be I'm

1578

01:04:18,740 --> 01:04:16,800

Irene Klotz with Reuters um on the aisle

1579

01:04:23,559 --> 01:04:18,750

is that it was that protocol developed

1580

01:04:26,019 --> 01:04:23,569

to try and not ease a space station

1581

01:04:27,370 --> 01:04:26,029

based EV a since there won't be any more

1582

01:04:29,349 --> 01:04:27,380

shuttle ones in other words you're

1583

01:04:31,900 --> 01:04:29,359

trying to make things a little easier

1584

01:04:33,939 --> 01:04:31,910

for the live aboard crew and also will

1585

01:04:36,459 --> 01:04:33,949

they be able to do a spacewalk like in

1586

01:04:38,410 --> 01:04:36,469

case of an emergency quicker that sort

1587

01:04:42,819 --> 01:04:38,420

of part of the thinking that went into

1588

01:04:44,469 --> 01:04:42,829

it that's a good question I mean it's

1589

01:04:46,449 --> 01:04:44,479

it's certainly it's a quality of life

1590

01:04:47,979 --> 01:04:46,459

issue for future cruise in that you

1591

01:04:49,479 --> 01:04:47,989

don't have to take two of the six crew

1592

01:04:52,509 --> 01:04:49,489

members and isolate them in the airlock

1593

01:04:54,579 --> 01:04:52,519

overnight which you know we go to great

1594

01:04:56,140 --> 01:04:54,589

pains not to separate and isolate the

1595

01:04:57,640 --> 01:04:56,150

crews from one another for obvious

1596

01:05:00,699 --> 01:04:57,650

reasons if there happens to be emergency

1597

01:05:03,249 --> 01:05:00,709

so not having in them and over in the

1598

01:05:06,880 --> 01:05:03,259

airlock overnight is a is a significant

1599

01:05:08,559 --> 01:05:06,890

benefit you know it makes the morning or

1600

01:05:10,599 --> 01:05:08,569

the evening before the EV a much more

1601  
01:05:13,900 --> 01:05:10,609  
normal it makes the morning of the EBA

1602  
01:05:16,029 --> 01:05:13,910  
look just like any other morning so so

1603  
01:05:18,459 --> 01:05:16,039  
those are significant benefits the other

1604  
01:05:21,189 --> 01:05:18,469  
thing that aisle helps with is that it

1605  
01:05:23,109 --> 01:05:21,199  
uses less oxygen than the campout

1606  
01:05:25,749 --> 01:05:23,119  
protocol so you know down the road

1607  
01:05:28,660 --> 01:05:25,759  
looking at station post shuttle that's

1608  
01:05:30,549 --> 01:05:28,670  
clearly a benefit you asked about your

1609  
01:05:32,049 --> 01:05:30,559  
ability to quickly do EBA is the

1610  
01:05:34,359 --> 01:05:32,059  
interesting thing about that question is

1611  
01:05:35,979 --> 01:05:34,369  
that typically it's the planning

1612  
01:05:39,099 --> 01:05:35,989  
required to get the crew ready that

1613  
01:05:41,739 --> 01:05:39,109

takes the time like if you look back at

1614

01:05:44,439 --> 01:05:41,749

the pump module or remove and replace

1615

01:05:47,439 --> 01:05:44,449

that we did in the last six months or so

1616

01:05:48,819 --> 01:05:47,449

you know the time between the pump

1617

01:05:50,880 --> 01:05:48,829

module failing and the crew going out

1618

01:05:53,739 --> 01:05:50,890

the door was really all driven by

1619

01:05:55,749 --> 01:05:53,749

procedure development and analysis and

1620

01:05:57,549 --> 01:05:55,759

all the work that's required to

1621

01:06:02,019 --> 01:05:57,559

understand the timeline and build the

1622

01:06:04,930 --> 01:06:02,029

sequence so you know I guess if you in

1623

01:06:06,579 --> 01:06:04,940

the in the in the event that you decided

1624

01:06:09,069 --> 01:06:06,589

to do in the EBA in the morning of you

1625

01:06:10,599 --> 01:06:09,079

could go do aisle and be able to do it

1626  
01:06:11,920 --> 01:06:10,609  
more quickly than camp out but that in

1627  
01:06:18,400 --> 01:06:11,930  
written in reality that would never

1628  
01:06:20,319 --> 01:06:18,410  
happen on the on the storm hardware

1629  
01:06:22,089 --> 01:06:20,329  
could you just maybe explain a little

1630  
01:06:24,279 --> 01:06:22,099  
bit about the similarities and

1631  
01:06:26,410 --> 01:06:24,289  
differences between other things like

1632  
01:06:28,920 --> 01:06:26,420  
the dragon I that's been tested and then

1633  
01:06:32,640 --> 01:06:28,930  
also just to clarify or I n is not

1634  
01:06:34,980 --> 01:06:32,650  
currently planned on docking at state

1635  
01:06:37,289 --> 01:06:34,990  
and this is just a way to use sort of

1636  
01:06:39,029 --> 01:06:37,299  
station as a test bed and shuttle as

1637  
01:06:41,609 --> 01:06:39,039  
test bed since that's what's available

1638  
01:06:44,220 --> 01:06:41,619

to do these kind of in flight tests is

1639

01:06:46,680 --> 01:06:44,230

that right yeah let's see the first part

1640

01:06:48,450 --> 01:06:46,690

of your question is is to try and

1641

01:06:50,250 --> 01:06:48,460

compare with some of the other dragon

1642

01:06:52,319 --> 01:06:50,260

eye and maybe tried are some of the

1643

01:06:54,059 --> 01:06:52,329

other systems fortune I don't have the

1644

01:06:58,079 --> 01:06:54,069

details of those systems so I can't give

1645

01:07:00,269 --> 01:06:58,089

you a good comparison as far as using

1646

01:07:04,319 --> 01:07:00,279

space station as a testbed absolutely

1647

01:07:05,700 --> 01:07:04,329

it's a it's a fantastic way to like I

1648

01:07:07,859 --> 01:07:05,710

said good and verify this capability

1649

01:07:10,349 --> 01:07:07,869

works and it is applicable to to

1650

01:07:12,779 --> 01:07:10,359

whatever we decide to do here in the new

1651  
01:07:15,059 --> 01:07:12,789  
years down the road so it just happens

1652  
01:07:17,490 --> 01:07:15,069  
to be you know designed and built for

1653  
01:07:20,539 --> 01:07:17,500  
the Ryan program and that in that space

1654  
01:07:23,849 --> 01:07:20,549  
capsules kiss base capsule is actually

1655  
01:07:25,799 --> 01:07:23,859  
developed and and the hardware is

1656  
01:07:26,819 --> 01:07:25,809  
available and folks are you know

1657  
01:07:29,430 --> 01:07:26,829  
Lockheed still working on that

1658  
01:07:34,620 --> 01:07:29,440  
spacecraft so it could still end up at

1659  
01:07:37,289 --> 01:07:34,630  
Space Station okay Washington Marcia den

1660  
01:07:40,200 --> 01:07:37,299  
Associated Press two questions do you

1661  
01:07:41,609 --> 01:07:40,210  
expect a Soyuz fly about decision before

1662  
01:07:44,599 --> 01:07:41,619  
the mission begins or might have dragged

1663  
01:07:47,760 --> 01:07:44,609

into the mission like it did last time

1664

01:07:49,589 --> 01:07:47,770

that's a hard question answer my hope is

1665

01:07:53,549 --> 01:07:49,599

that we'll have a decision before the

1666

01:07:54,930 --> 01:07:53,559

mission if you look at the 133 situation

1667

01:07:56,460 --> 01:07:54,940

they didn't start talking about it until

1668

01:07:59,190 --> 01:07:56,470

about two weeks before launch so they

1669

01:08:01,470 --> 01:07:59,200

were and they had a lot of work to do in

1670

01:08:03,120 --> 01:08:01,480

a very short period of time may we have

1671

01:08:05,130 --> 01:08:03,130

the benefit of the work that they did to

1672

01:08:07,260 --> 01:08:05,140

plant it and we have more time between

1673

01:08:09,510 --> 01:08:07,270

now and Lawrence so my expectation is

1674

01:08:13,769 --> 01:08:09,520

that will have a decision before the

1675

01:08:15,420 --> 01:08:13,779

launch endeavors last flight if you

1676

01:08:18,360 --> 01:08:15,430

could maybe just touch on that briefly

1677

01:08:23,880 --> 01:08:18,370

in any payloads going up to commemorate

1678

01:08:27,090 --> 01:08:23,890

that of course the last flight of each

1679

01:08:28,590 --> 01:08:27,100

of these vehicles is you know very

1680

01:08:30,269 --> 01:08:28,600

bittersweet for all of us that have

1681

01:08:33,720 --> 01:08:30,279

invested so much of our time and cruise

1682

01:08:36,599 --> 01:08:33,730

into these flights I've been so focused

1683

01:08:38,340 --> 01:08:36,609

on getting this this mission planned and

1684

01:08:39,780 --> 01:08:38,350

and all these details worked out all our

1685

01:08:41,550 --> 01:08:39,790

contingency planning together I haven't

1686

01:08:44,280 --> 01:08:41,560

spent too much time thinking about it I

1687

01:08:45,620 --> 01:08:44,290

know I have lots of time here starting

1688

01:08:50,090 --> 01:08:45,630

in the summer 22

1689

01:08:51,590 --> 01:08:50,100

look back and reflect but certainly it's

1690

01:08:54,260 --> 01:08:51,600

going to be a bittersweet moment to see

1691

01:08:55,189 --> 01:08:54,270

it back on the runway at KSC and I'm

1692

01:08:58,249 --> 01:08:55,199

sorry the second part of your question

1693

01:09:01,160 --> 01:08:58,259

was loads you're taking up items over

1694

01:09:03,439 --> 01:09:01,170

booyah yeah there are some there are

1695

01:09:05,809 --> 01:09:03,449

some special items going up and for

1696

01:09:07,519 --> 01:09:05,819

China that that lists with me but there

1697

01:09:10,280 --> 01:09:07,529

are things like patches etc that are

1698

01:09:13,629 --> 01:09:10,290

going up to to commemorate and the crews

1699

01:09:15,979 --> 01:09:13,639

going to get it give a a commemoration

1700

01:09:21,860 --> 01:09:15,989

statement later in the mission and will

1701

01:09:24,740 --> 01:09:21,870

provide to y'all okay Jim go back I'll

1702

01:09:26,419 --> 01:09:24,750

and explain a few things i'm still talk

1703

01:09:28,249 --> 01:09:26,429

about partially suited crewmen in a

1704

01:09:30,229 --> 01:09:28,259

lower in a lower pressure environment or

1705

01:09:33,709 --> 01:09:30,239

is it is he wearing just the upper up

1706

01:09:35,870 --> 01:09:33,719

proportionately and the sudanese he also

1707

01:09:37,910 --> 01:09:35,880

presumably think he couldn't get from

1708

01:09:40,990 --> 01:09:37,920

different pressure than ambient in a km

1709

01:09:43,729 --> 01:09:41,000

in Cabin the cc's breathing pure oxygen

1710

01:09:46,849 --> 01:09:43,739

the the way that the protocol lays out

1711

01:09:48,860 --> 01:09:46,859

he does he does a standard 60-minute

1712

01:09:51,370 --> 01:09:48,870

pre-breathe on pure oxygen just like he

1713

01:09:55,520 --> 01:09:51,380

would on on a normally be a day and then

1714

01:09:57,470 --> 01:09:55,530

we put him and his IV support crew the 2

1715

01:09:59,860 --> 01:09:57,480

eb a crew plus the ib support guys in

1716

01:10:03,200 --> 01:09:59,870

the airlock we depress it to 10 2 and

1717

01:10:05,959 --> 01:10:03,210

then he does his suit donning at 10 2 in

1718

01:10:07,340 --> 01:10:05,969

the airlock so once he's in a suit and

1719

01:10:10,600 --> 01:10:07,350

buttoned up and that the suit pressure

1720

01:10:13,910 --> 01:10:10,610

then we bring the airlock back tambien

1721

01:10:16,520 --> 01:10:13,920

1470 okay so he's in he's in the suit at

1722

01:10:19,399 --> 01:10:16,530

1010 to and you bring the prayer the

1723

01:10:23,240 --> 01:10:19,409

ambient pressure up to 55 to 14-7 right

1724

01:10:25,100 --> 01:10:23,250

and that doesn't have any kind of he's

1725

01:10:26,419 --> 01:10:25,110

got external pressure on a suit and I've

1726

01:10:29,479 --> 01:10:26,429

ever seen that never seen anyone operate

1727

01:10:31,610 --> 01:10:29,489

with external pressure on the suit is

1728

01:10:35,930 --> 01:10:31,620

that it kind of a bit mobility issue or

1729

01:10:37,760 --> 01:10:35,940

nope oh that's fine okay and he's a met

1730

01:10:40,399 --> 01:10:37,770

and so he's at ten to he's still in the

1731

01:10:44,290 --> 01:10:40,409

proper o2 oxygen nitrogen ratio it's not

1732

01:10:47,060 --> 01:10:44,300

pure accident correct okay yummy word

1733

01:10:50,350 --> 01:10:47,070

okay thank you yeah and alice is going

1734

01:10:53,630 --> 01:10:50,360

to have more detail as well

1735

01:10:55,730 --> 01:10:53,640

hi clara moskowitz with space com a

1736

01:10:57,650 --> 01:10:55,740

couple questions the first one with the

1737

01:10:59,450 --> 01:10:57,660

potential soy is fly around that you're

1738

01:11:02,030 --> 01:10:59,460

considering if you could just help me

1739

01:11:03,830 --> 01:11:02,040

understand um if I'm correct the reason

1740

01:11:05,780 --> 01:11:03,840

it didn't happen last time was safety

1741

01:11:13,010 --> 01:11:05,790

considerations and and how would those

1742

01:11:14,690 --> 01:11:13,020

be different in this case yeah one of

1743

01:11:16,280 --> 01:11:14,700

the challenges we had last time was just

1744

01:11:20,030 --> 01:11:16,290

the time available to assess and

1745

01:11:21,860 --> 01:11:20,040

planning I mean that that was a that was

1746

01:11:23,150 --> 01:11:21,870

it's a significant operation that we

1747

01:11:25,610 --> 01:11:23,160

need to look at closely and make sure

1748

01:11:28,340 --> 01:11:25,620

that we understand and do it safely so

1749

01:11:29,870 --> 01:11:28,350

so one of the challenges is that we we

1750

01:11:32,450 --> 01:11:29,880

just didn't quite get there in time to

1751  
01:11:34,970 --> 01:11:32,460  
make it work for 133 the other the other

1752  
01:11:36,980 --> 01:11:34,980  
issue or concern identified by our

1753  
01:11:38,540 --> 01:11:36,990  
Russian colleagues that was at the Soyuz

1754  
01:11:41,450 --> 01:11:38,550  
that would have been used for the 133

1755  
01:11:44,690 --> 01:11:41,460  
fly about is a is a newer version of the

1756  
01:11:46,790 --> 01:11:44,700  
Soyuz with not as many miles on it not

1757  
01:11:49,790 --> 01:11:46,800  
as much flight experience for what we're

1758  
01:11:51,770 --> 01:11:49,800  
talking about a 134 we we have the older

1759  
01:11:56,180 --> 01:11:51,780  
version the Soyuz so those same issues

1760  
01:11:58,040 --> 01:11:56,190  
wouldn't apply so just to reiterate

1761  
01:12:00,410 --> 01:11:58,050  
there's nothing unsafe about the

1762  
01:12:02,600 --> 01:12:00,420  
trajectory the flying techniques are

1763  
01:12:05,450 --> 01:12:02,610

well understood the crew be well trained

1764

01:12:06,650 --> 01:12:05,460

to go do it for 133 it was we didn't

1765

01:12:08,690 --> 01:12:06,660

quite have the time to finish the

1766

01:12:10,730 --> 01:12:08,700

analysis and there was some specific

1767

01:12:14,360 --> 01:12:10,740

concerns about that so use that we would

1768

01:12:16,820 --> 01:12:14,370

have flown with thanks um and also just

1769

01:12:18,410 --> 01:12:16,830

with testing out of the aisle a protocol

1770

01:12:20,030 --> 01:12:18,420

is there a reason why that's not

1771

01:12:22,070 --> 01:12:20,040

happening during the first two EVs

1772

01:12:23,630 --> 01:12:22,080

that's a good question there's not

1773

01:12:25,760 --> 01:12:23,640

really a lot of science behind it the

1774

01:12:27,530 --> 01:12:25,770

thought was since its new and we might

1775

01:12:29,510 --> 01:12:27,540

be surprised by things we wanted to get

1776

01:12:33,730 --> 01:12:29,520

a couple ebas behind us before we used

1777

01:12:36,050 --> 01:12:33,740

it's really as simple as that okay

1778

01:12:38,630 --> 01:12:36,060

any more questions on this other room do

1779

01:12:45,410 --> 01:12:38,640

we have any follow-ups on the other side

1780

01:12:52,050 --> 01:12:47,910

it's a Philips loss with NASA space but

1781

01:12:55,320 --> 01:12:52,060

calm again on the port Sarge lube how

1782

01:12:57,290 --> 01:12:55,330

often do the race rings need to be do

1783

01:13:01,560 --> 01:12:57,300

they need this if i recall correctly

1784

01:13:03,000 --> 01:13:01,570

both of them were done on Ulf too so I

1785

01:13:05,040 --> 01:13:03,010

mean is something that needs to be done

1786

01:13:07,730 --> 01:13:05,050

periodically and if so when with the

1787

01:13:10,530 --> 01:13:07,740

starboard race ring need to be redone

1788

01:13:12,090 --> 01:13:10,540

yeah there there are numbers I don't

1789

01:13:13,560 --> 01:13:12,100

have the numbers available to me here in

1790

01:13:16,260 --> 01:13:13,570

front of me we can certainly get you

1791

01:13:18,360 --> 01:13:16,270

those I can't say that that the

1792

01:13:21,030 --> 01:13:18,370

lubrication we're doing on this this

1793

01:13:22,350 --> 01:13:21,040

flight is earlier than called for you

1794

01:13:24,000 --> 01:13:22,360

know based on the analysis so we're

1795

01:13:27,000 --> 01:13:24,010

taking this this opportunity to go do it

1796

01:13:31,590 --> 01:13:27,010

because it's a relatively complicated

1797

01:13:32,970 --> 01:13:31,600

task that it's a it's nice to well it's

1798

01:13:34,620 --> 01:13:32,980

a complicated test that it's nice to

1799

01:13:36,630 --> 01:13:34,630

have a shuttle crew focused on to go do

1800

01:13:39,180 --> 01:13:36,640

and we're using shuttle resources for

1801  
01:13:42,680 --> 01:13:39,190  
the EBA vice station resources so we're

1802  
01:13:49,650 --> 01:13:46,280  
well yeah just a quick one on the on the

1803  
01:13:51,510 --> 01:13:49,660  
ammonia refill that's not something that

1804  
01:13:52,650 --> 01:13:51,520  
can never be fixed i'm assuming

1805  
01:13:54,060 --> 01:13:52,660  
periodically then you're just going to

1806  
01:13:56,460 --> 01:13:54,070  
have to do this over and over again to

1807  
01:13:58,980 --> 01:13:56,470  
keep that thing top top yeah it's a very

1808  
01:14:01,290 --> 01:13:58,990  
very slow leak and there's really no

1809  
01:14:02,700 --> 01:14:01,300  
good way to identify the location just

1810  
01:14:03,990 --> 01:14:02,710  
because a lot of those plumbing lines

1811  
01:14:07,830 --> 01:14:04,000  
are buried in the truss segment you

1812  
01:14:09,480 --> 01:14:07,840  
can't really get at so if it continues

1813  
01:14:11,670 --> 01:14:09,490

we would have to do this type of

1814

01:14:13,560 --> 01:14:11,680

resurfacing get in the future and the

1815

01:14:16,530 --> 01:14:13,570

ammonia is available via the ammonia

1816

01:14:18,060 --> 01:14:16,540

tank assembly we just have to do the the

1817

01:14:22,110 --> 01:14:18,070

same basically out of the plumbing to

1818

01:14:24,540 --> 01:14:22,120

get Damone you there okay check one last

1819

01:14:26,850 --> 01:14:24,550

time for questions here before we wrap

1820

01:14:28,710 --> 01:14:26,860

up the briefing it looks like no one

1821

01:14:30,030 --> 01:14:28,720

else has an additional question I want

1822

01:14:31,440 --> 01:14:30,040

to give you a little heads up on the

1823

01:14:34,260 --> 01:14:31,450

rest of our briefing schedule for the

1824

01:14:36,360 --> 01:14:34,270

day of course at twelve-thirty p.m. will

1825

01:14:37,860 --> 01:14:36,370

have Allison Bollinger here the lead

1826

01:14:39,330 --> 01:14:37,870

spacewalk officer to give you some more

1827

01:14:42,120 --> 01:14:39,340

details about that and the aisle

1828

01:14:43,830 --> 01:14:42,130

protocol at 130 will send the satellite

1829

01:14:45,990 --> 01:14:43,840

out to NASA headquarters for today's

1830

01:14:48,780 --> 01:14:46,000

video file and then a2 p.m. we'll be

1831

01:14:50,850 --> 01:14:48,790

back with the sts-134 crew conference