1
00:00:05,510 --> 00:00:03,429
good day and welcome back to the johnson

2
00:00:08,790 --> 00:00:05,520
space center as our pre-flight briefings

3
00:00:11,030 --> 00:00:08,800
continue for the sts-135 ulf-7 mission

4
00:00:13,030 --> 00:00:11,040
to the international space station

5
00:00:14,629 --> 00:00:13,040
this is the mission overview briefing

6
00:00:16,150 --> 00:00:14,639
and with us today are the two gentlemen

7
00:00:17,750 --> 00:00:16,160
who will preside over the final flight

8
00:00:20,150 --> 00:00:17,760
of atlantis and the last flight in the

9
00:00:22,790 --> 00:00:20,160
space shuttle program's history to my

10
00:00:24,230 --> 00:00:22,800
left kwasi alabarujo the lead space

11
00:00:27,189 --> 00:00:24,240
shuttle director

12
00:00:29,990 --> 00:00:27,199
flight director for sts-135 and to his

13
00:00:32,549 --> 00:00:30,000

left chris edelen the lead space station

14
00:00:35,670 --> 00:00:32,559
flight director for ulf7 and we'll start

15
00:00:37,750 --> 00:00:35,680
off with quatzi thank you rob

16
00:00:40,229 --> 00:00:37,760
good afternoon good morning

17
00:00:41,910 --> 00:00:40,239
it's my honor to be here to talk to you

18
00:00:43,430 --> 00:00:41,920
about the details of

19
00:00:44,470 --> 00:00:43,440
this final flight of the space shuttle

20
00:00:46,869 --> 00:00:44,480
atlantis

21
00:00:49,430 --> 00:00:46,879
the sts-135 mission

22
00:00:51,029 --> 00:00:49,440
her cargo and her crew

23
00:00:52,950 --> 00:00:51,039
the primary objectives of this mission

24
00:00:54,229 --> 00:00:52,960
of course as you heard from our program

25
00:00:56,709 --> 00:00:54,239
management

26
00:00:58,389 --> 00:00:56,719
are to bring the multi-purpose logistics

27
00:00:59,830 --> 00:00:58,399
module to the international space

28
00:01:01,750 --> 00:00:59,840
station

29
00:01:04,070 --> 00:01:01,760
to provide some resupply and logistics

30
00:01:06,390 --> 00:01:04,080
to set the space station up for

31
00:01:07,750 --> 00:01:06,400
continued operations uh through the end

32
00:01:09,990 --> 00:01:07,760
of 2012

33
00:01:12,550 --> 00:01:10,000
as well as to return

34
00:01:14,390 --> 00:01:12,560
a failed component the external control

35
00:01:17,350 --> 00:01:14,400
system thermal control system pump

36
00:01:19,350 --> 00:01:17,360
module from the iss and to deploy

37
00:01:20,789 --> 00:01:19,360
a special payload the robotics refueling

38
00:01:23,670 --> 00:01:20,799

mission module

39
00:01:25,190 --> 00:01:23,680
which is a technology demonstration uh

40
00:01:26,710 --> 00:01:25,200
payload that

41
00:01:28,950 --> 00:01:26,720
has been developed by goddard space

42
00:01:29,830 --> 00:01:28,960
flight center we'll have more details on

43
00:01:34,630 --> 00:01:29,840
on

44
00:01:36,710 --> 00:01:34,640
uh in uh in the moments to come

45
00:01:40,710 --> 00:01:36,720
if we could have uh

46
00:01:43,109 --> 00:01:40,720
the still of the sts-135 crew we we have

47
00:01:45,350 --> 00:01:43,119
an awesome crew for this mission uh

48
00:01:48,149 --> 00:01:45,360
veteran space fliers uh commanded by

49
00:01:51,350 --> 00:01:48,159
chris ferguson a retired captain the us

50
00:01:53,190 --> 00:01:51,360
navy veteran of space flights sts-115

51
00:01:55,190 --> 00:01:53,200
scs-126

52
00:01:57,749 --> 00:01:55,200
also pilot

53
00:01:58,550 --> 00:01:57,759
doug hurley who's colonel u.s marine

54
00:02:00,030 --> 00:01:58,560
corps

55
00:02:03,590 --> 00:02:00,040
and a veteran of

56
00:02:05,590 --> 00:02:03,600
sts-127 you have dr sandy magnus

57
00:02:07,030 --> 00:02:05,600
who is an experienced shuttle and space

58
00:02:10,710 --> 00:02:07,040
station crew member

59
00:02:13,270 --> 00:02:10,720
previously flown on sts-112 sts-126

60
00:02:15,510 --> 00:02:13,280
and she was flight engineer on

61
00:02:18,150 --> 00:02:15,520
expedition 18

62
00:02:19,750 --> 00:02:18,160
and returned home on sts-119

63
00:02:21,430 --> 00:02:19,760

and then also we have

64
00:02:25,350 --> 00:02:21,440
veteran spacewalker

65
00:02:28,229 --> 00:02:25,360
rex walheim who flew on sts-110 as well

66
00:02:30,390 --> 00:02:28,239
as sts-122

67
00:02:32,869 --> 00:02:30,400
the crew patch for this mission

68
00:02:35,830 --> 00:02:32,879
which you can see in another still

69
00:02:38,470 --> 00:02:35,840
is a very special one very symbolic

70
00:02:40,309 --> 00:02:38,480
it symbolizes and pays tribute to the

71
00:02:42,949 --> 00:02:40,319
legacy of the space shuttle program as

72
00:02:44,790 --> 00:02:42,959
well as the contributions of the civil

73
00:02:46,869 --> 00:02:44,800
servant and contractor workforce that

74
00:02:48,710 --> 00:02:46,879
have contributed to the space shuttle

75
00:02:51,750 --> 00:02:48,720
you see atlantis there in the center of

76
00:02:54,550 --> 00:02:51,760
the patch uh embarking on her mission

77
00:02:56,949 --> 00:02:54,560
set over elements of the nasa emblem

78
00:02:59,430 --> 00:02:56,959
and particularly powerful is the omega

79
00:03:01,670 --> 00:02:59,440
which is prominently figured in uh

80
00:03:02,710 --> 00:03:01,680
probably featured in the in the the

81
00:03:04,949 --> 00:03:02,720
image

82
00:03:06,710 --> 00:03:04,959
to symbolize the end of the program as

83
00:03:08,790 --> 00:03:06,720
omega is the last letter of the the

84
00:03:10,710 --> 00:03:08,800
greek alphabet and i think this patch

85
00:03:12,550 --> 00:03:10,720
really summarizes the

86
00:03:15,190 --> 00:03:12,560
the legacy of the shuttle program as

87
00:03:16,949 --> 00:03:15,200
well as the significance of of this

88
00:03:18,070 --> 00:03:16,959

particular mission

89
00:03:19,270 --> 00:03:18,080
let me tell you a little bit about the

90
00:03:21,110 --> 00:03:19,280
flight director team that will be

91
00:03:23,190 --> 00:03:21,120
supporting space shuttle operations on

92
00:03:25,030 --> 00:03:23,200
this flight uh as the league shuttle

93
00:03:26,949 --> 00:03:25,040
flight director i'll be on the orbit one

94
00:03:29,110 --> 00:03:26,959
team as is traditional

95
00:03:31,110 --> 00:03:29,120
we also have uh ascent flight director

96
00:03:33,509 --> 00:03:31,120
richard jones and you'll see a picture

97
00:03:35,110 --> 00:03:33,519
of him uh there and still

98
00:03:37,190 --> 00:03:35,120
photograph

99
00:03:39,750 --> 00:03:37,200
working orbit two uh will be flight

100
00:03:41,830 --> 00:03:39,760
director rick lebrode who's uh also

101
00:03:43,110 --> 00:03:41,840
highly experienced space shuttle flight

102
00:03:44,789 --> 00:03:43,120
director

103
00:03:47,270 --> 00:03:44,799
our planning shift will be presided over

104
00:03:49,350 --> 00:03:47,280
by uh senior space shuttle flight

105
00:03:51,190 --> 00:03:49,360
director mr paul dye

106
00:03:52,869 --> 00:03:51,200
who has flown more space shuttle

107
00:03:53,750 --> 00:03:52,879
missions than anyone currently in the

108
00:03:55,589 --> 00:03:53,760
office

109
00:03:57,990 --> 00:03:55,599
and then our team four flight director

110
00:04:00,550 --> 00:03:58,000
this is the gentleman who will uh who

111
00:04:03,350 --> 00:04:00,560
will help lead lead special support

112
00:04:05,030 --> 00:04:03,360
teams and resolution of any

113
00:04:06,229 --> 00:04:05,040

intractable problems which of course we

114
00:04:07,750 --> 00:04:06,239
hope we don't have and that will be mr

115
00:04:09,589 --> 00:04:07,760
gary horlocker

116
00:04:12,630 --> 00:04:09,599
he'll be presiding over our over our

117
00:04:15,190 --> 00:04:12,640
team four and then entry flight director

118
00:04:17,110 --> 00:04:15,200
tony sakachi he will handle the team

119
00:04:20,550 --> 00:04:17,120
that will be presiding over atlantis

120
00:04:22,150 --> 00:04:20,560
final deorbit entry and landing

121
00:04:24,790 --> 00:04:22,160
so this is a an excellent flight

122
00:04:26,469 --> 00:04:24,800
director team to go along with an

123
00:04:28,469 --> 00:04:26,479
outstanding crew

124
00:04:30,270 --> 00:04:28,479
that will very capably perform

125
00:04:33,110 --> 00:04:30,280
all of the mission objectives for

126
00:04:34,790 --> 00:04:33,120
sts-135 and i personally am very excited

127
00:04:37,189 --> 00:04:34,800
about working not only with our crew but

128
00:04:38,230 --> 00:04:37,199
also with the the other flight directors

129
00:04:40,629 --> 00:04:38,240
and flight controllers that will be

130
00:04:42,710 --> 00:04:40,639
supporting the mission

131
00:04:44,629 --> 00:04:42,720
just to show you uh how atlantis's

132
00:04:47,030 --> 00:04:44,639
payload bay is configured

133
00:04:48,950 --> 00:04:47,040
let's have the first video and you can

134
00:04:51,110 --> 00:04:48,960
see the various elements of the payload

135
00:04:53,189 --> 00:04:51,120
bay

136
00:04:55,990 --> 00:04:53,199
here you've got uh atlantis's payload

137
00:04:57,749 --> 00:04:56,000
bay in its final configuration

138
00:04:59,189 --> 00:04:57,759

on the forward end of the spacecraft you

139
00:05:00,710 --> 00:04:59,199
see the orbiter docking system which

140
00:05:04,230 --> 00:05:00,720
will allow it to mate to the

141
00:05:09,670 --> 00:05:06,390
we also have featured prominently the

142
00:05:11,270 --> 00:05:09,680
shuttle remote manipulator

143
00:05:13,350 --> 00:05:11,280
and on the other side of the spacecraft

144
00:05:15,749 --> 00:05:13,360
is the orbiter boom sensor system which

145
00:05:19,110 --> 00:05:15,759
will be used to inspect the the thermal

146
00:05:21,430 --> 00:05:19,120
protection system of atlantis

147
00:05:23,189 --> 00:05:21,440
underneath the obss you see

148
00:05:25,749 --> 00:05:23,199
a canister which will be used to deploy

149
00:05:27,990 --> 00:05:25,759
the picosat solar cell

150
00:05:29,590 --> 00:05:28,000
experiment after undocking

151
00:05:31,510 --> 00:05:29,600
and there of course is

152
00:05:33,830 --> 00:05:31,520
our cargo carrier the multi-purpose

153
00:05:36,390 --> 00:05:33,840
logistics module and aft of the mplm we

154
00:05:38,230 --> 00:05:36,400
have the lmc lightweight

155
00:05:39,749 --> 00:05:38,240
mpez carrier which i'll give you some

156
00:05:42,550 --> 00:05:39,759
more detail on

157
00:05:44,629 --> 00:05:42,560
you see the lmc is essentially a truss

158
00:05:47,110 --> 00:05:44,639
which is specially equipped to carry

159
00:05:50,070 --> 00:05:47,120
cargo on the underside of the lmc is the

160
00:05:53,510 --> 00:05:50,080
robotic refueling mission

161
00:05:58,790 --> 00:05:56,230
orbital refueling demonstration payload

162
00:06:00,629 --> 00:05:58,800
and then you see where the failed etcs

163
00:06:02,870 --> 00:06:00,639

pump module will return after we

164
00:06:06,710 --> 00:06:02,880
retrieve it from the iss that will

165
00:06:08,070 --> 00:06:06,720
fly home in atlantis payload bay

166
00:06:09,270 --> 00:06:08,080
so that's how the spacecraft is

167
00:06:11,510 --> 00:06:09,280
configured

168
00:06:14,309 --> 00:06:11,520
and we are highly confident that we'll

169
00:06:17,110 --> 00:06:14,319
be able to get all of the cargo deployed

170
00:06:19,350 --> 00:06:17,120
properly and we have an excellent team

171
00:06:21,189 --> 00:06:19,360
that's worked hard to be able to do that

172
00:06:23,029 --> 00:06:21,199
just give you an overview of

173
00:06:24,710 --> 00:06:23,039
the activities on the mission starting

174
00:06:27,110 --> 00:06:24,720
with flight day one

175
00:06:29,430 --> 00:06:27,120
we'll be conducting our normal launch

176
00:06:32,070 --> 00:06:29,440
ascent asset imagery

177
00:06:34,629 --> 00:06:32,080
activities as you've come to expect

178
00:06:35,909 --> 00:06:34,639
we'll be deploying laptops to provide

179
00:06:38,309 --> 00:06:35,919
access to

180
00:06:40,870 --> 00:06:38,319
special files updates to the flight plan

181
00:06:42,870 --> 00:06:40,880
changes to the execute package and uh

182
00:06:45,430 --> 00:06:42,880
procedures that we'll be updating for

183
00:06:47,909 --> 00:06:45,440
the crew during the mission we'll also

184
00:06:49,749 --> 00:06:47,919
be activating the robotic arm and

185
00:06:51,909 --> 00:06:49,759
checking it out making sure that it's

186
00:06:53,430 --> 00:06:51,919
prepared to conduct the the thermal

187
00:06:55,670 --> 00:06:53,440
protection system inspections on the

188
00:06:58,150 --> 00:06:55,680

following day and then we'll do our

189
00:07:00,710 --> 00:06:58,160
standard ohms pot survey

190
00:07:02,550 --> 00:07:00,720
on flight day two is when we'll conduct

191
00:07:04,710 --> 00:07:02,560
our tps inspections and we have another

192
00:07:07,589 --> 00:07:04,720
video to show you to illustrate how that

193
00:07:13,189 --> 00:07:09,909
here you see the robotic manipulator

194
00:07:15,430 --> 00:07:13,199
grappling the orbiter boom sensor system

195
00:07:17,189 --> 00:07:15,440
the orbiter boom sensor system the obss

196
00:07:18,950 --> 00:07:17,199
will then be maneuvered into position to

197
00:07:21,430 --> 00:07:18,960
start survey of the

198
00:07:23,589 --> 00:07:21,440
starboard wing

199
00:07:26,230 --> 00:07:23,599
there the various sensor packages on the

200
00:07:28,629 --> 00:07:26,240
obss which include high resolution still

201
00:07:29,510 --> 00:07:28,639
camera a later laser

202
00:07:32,710 --> 00:07:29,520
range

203
00:07:35,510 --> 00:07:32,720
imager as well as a video camera will

204
00:07:37,189 --> 00:07:35,520
sweep over the critical surfaces of

205
00:07:39,510 --> 00:07:37,199
atlantis thermal protection system

206
00:07:40,950 --> 00:07:39,520
looking for any imperfections

207
00:07:43,430 --> 00:07:40,960
any damage that might have been caused

208
00:07:44,469 --> 00:07:43,440
by ascent debris or anything that might

209
00:07:46,390 --> 00:07:44,479
compromise

210
00:07:48,150 --> 00:07:46,400
atlantis capability to perform a safe

211
00:07:50,629 --> 00:07:48,160
re-entry

212
00:07:54,070 --> 00:07:50,639
after inspecting the wing leading edge

213
00:07:54,869 --> 00:07:54,080

and also areas of the payload bay door

214
00:08:00,790 --> 00:07:54,879
the

215
00:08:03,430 --> 00:08:00,800
carbon material

216
00:08:05,749 --> 00:08:03,440
that's on the leading edge of the wings

217
00:08:08,790 --> 00:08:05,759
once that inspection is complete

218
00:08:11,029 --> 00:08:08,800
the obss will then move to the

219
00:08:12,790 --> 00:08:11,039
port wing

220
00:08:14,869 --> 00:08:12,800
and conduct similar inspections of the

221
00:08:16,390 --> 00:08:14,879
thermal protection system there again

222
00:08:19,430 --> 00:08:16,400
looking for imperfections looking for

223
00:08:21,189 --> 00:08:19,440
orbital debris damage acid debris damage

224
00:08:23,110 --> 00:08:21,199
and anything that we might need to go

225
00:08:26,070 --> 00:08:23,120
address and remediate

226
00:08:27,909 --> 00:08:26,080
we'll conclude by inspecting the port

227
00:08:30,710 --> 00:08:27,919
payload bay door

228
00:08:33,430 --> 00:08:30,720
as well as some of the areas

229
00:08:36,070 --> 00:08:33,440
where umbilicals were attached prior to

230
00:08:40,709 --> 00:08:38,630
we expect this inspection to take most

231
00:08:42,790 --> 00:08:40,719
of the day on flight day two as

232
00:08:43,990 --> 00:08:42,800
mr shannon alluded to it will be

233
00:08:46,150 --> 00:08:44,000
challenging to get through that

234
00:08:48,790 --> 00:08:46,160
inspection uh with the reduced crew

235
00:08:51,590 --> 00:08:48,800
compliment but this crew has practiced

236
00:08:53,590 --> 00:08:51,600
considerably uh to be able to develop a

237
00:08:55,269 --> 00:08:53,600
flow or routine if you will

238
00:08:57,590 --> 00:08:55,279

to where even though they have fewer

239
00:08:59,829 --> 00:08:57,600
hands available in the shuttle they'll

240
00:09:02,310 --> 00:08:59,839
be able to get through these inspections

241
00:09:04,070 --> 00:09:02,320
with with confidence and within the time

242
00:09:06,550 --> 00:09:04,080
frame that's been allotted for them and

243
00:09:09,990 --> 00:09:06,560
then birth and stow the obss as you see

244
00:09:14,550 --> 00:09:12,230
after the conclusion of the flight day 2

245
00:09:16,230 --> 00:09:14,560
thermal protection system inspections

246
00:09:18,150 --> 00:09:16,240
the crew will complete

247
00:09:20,630 --> 00:09:18,160
checkout of the various tools that

248
00:09:23,430 --> 00:09:20,640
assist them with rendezvous and docking

249
00:09:25,750 --> 00:09:23,440
and the very next day they'll engage in

250
00:09:27,910 --> 00:09:25,760
atlantis's final rendezvous and docking

251
00:09:29,430 --> 00:09:27,920
with the international space station

252
00:09:31,829 --> 00:09:29,440
we have a video to illustrate the final

253
00:09:35,030 --> 00:09:31,839
phases of that rendezvous and docking

254
00:09:38,310 --> 00:09:35,040
we expect atlantis to arrive on the r

255
00:09:40,790 --> 00:09:38,320
bar or just underneath the space station

256
00:09:41,990 --> 00:09:40,800
iss crew members will will then prepare

257
00:09:44,790 --> 00:09:42,000
to take

258
00:09:47,910 --> 00:09:44,800
photographic high resolution imagery

259
00:09:49,509 --> 00:09:47,920
with 400 800 and also 1 000 millimeter

260
00:09:51,910 --> 00:09:49,519
lenses

261
00:09:54,150 --> 00:09:51,920
this will help us evaluate

262
00:09:55,829 --> 00:09:54,160
other areas of the atlantis thermal

263
00:09:57,350 --> 00:09:55,839

protection system that we were not able

264
00:10:01,430 --> 00:09:57,360
to see

265
00:10:03,990 --> 00:10:01,440
with the the orbiter boom sensor system

266
00:10:05,509 --> 00:10:04,000
and also help us help us assess the the

267
00:10:07,190 --> 00:10:05,519
capability of the spacecraft to perform

268
00:10:10,550 --> 00:10:07,200
a safe reentry

269
00:10:12,310 --> 00:10:10,560
once atlantis final rpm maneuver or

270
00:10:14,230 --> 00:10:12,320
arbor pitch maneuver is complete

271
00:10:16,710 --> 00:10:14,240
atlantis will maneuver to what we call

272
00:10:19,590 --> 00:10:16,720
the v-bar which is basically putting it

273
00:10:21,190 --> 00:10:19,600
out in front of the space station

274
00:10:23,990 --> 00:10:21,200
and then commander chris ferguson will

275
00:10:24,949 --> 00:10:24,000
uh will guide atlantis to her final

276
00:10:29,750 --> 00:10:24,959
approach

277
00:10:32,389 --> 00:10:31,670
again with the reduced crew complement

278
00:10:38,870 --> 00:10:32,399
the

279
00:10:40,870 --> 00:10:38,880
will be a little bit uh different but uh

280
00:10:42,710 --> 00:10:40,880
they've been able to get a good flow and

281
00:10:46,470 --> 00:10:42,720
we've rehearsed this rendezvous scenario

282
00:10:48,949 --> 00:10:46,480
several times with the crew and we are

283
00:10:50,790 --> 00:10:48,959
excited to uh to engage in this final

284
00:10:52,630 --> 00:10:50,800
rendezvous with the international space

285
00:10:53,829 --> 00:10:52,640
station we think it'll be a great day

286
00:10:55,430 --> 00:10:53,839
and we think we'll

287
00:10:57,509 --> 00:10:55,440
get some great imagery of the shuttle on

288
00:10:59,190 --> 00:10:57,519

her final approach

289
00:11:02,790 --> 00:10:59,200
after hatch opening

290
00:11:05,750 --> 00:11:02,800
we'll hand off the the obss to the

291
00:11:07,509 --> 00:11:05,760
uh to the uh the space station robotic

292
00:11:09,430 --> 00:11:07,519
arm we do have a video of that a brief

293
00:11:11,350 --> 00:11:09,440
clip that we'll show you

294
00:11:14,230 --> 00:11:11,360
and that's basically to get the orbiter

295
00:11:16,550 --> 00:11:14,240
boom sensor system out of the way uh so

296
00:11:20,069 --> 00:11:16,560
that when we get ready to unbirth and

297
00:11:23,030 --> 00:11:20,079
install the mplm uh we'll be able to

298
00:11:26,949 --> 00:11:23,040
avoid any risk of of uh colliding with

299
00:11:29,030 --> 00:11:26,959
the uh the structure of the the obss

300
00:11:30,790 --> 00:11:29,040
so essentially uh the shuttle's the

301
00:11:33,590 --> 00:11:30,800
station's robotic arm excuse me will

302
00:11:36,230 --> 00:11:33,600
grapple the obss and hand it off to the

303
00:11:38,470 --> 00:11:36,240
space shuttle robotic arm where the

304
00:11:42,710 --> 00:11:38,480
space shuttle robotic arm will then uh

305
00:11:44,710 --> 00:11:42,720
essentially move the obss to a benign

306
00:11:46,630 --> 00:11:44,720
camera viewing position where

307
00:11:48,790 --> 00:11:46,640
that part of the boom will be

308
00:11:49,750 --> 00:11:48,800
well clear of any structure

309
00:11:53,590 --> 00:11:49,760
that

310
00:11:55,509 --> 00:11:53,600
removed from the payload bay and

311
00:11:57,910 --> 00:11:55,519
installed

312
00:12:01,030 --> 00:11:57,920
at that point uh we'll begin the docked

313
00:12:02,710 --> 00:12:01,040

phase of the mission and uh all of the

314
00:12:04,629 --> 00:12:02,720
objectives that are

315
00:12:06,949 --> 00:12:04,639
encompassed in that phase and i'll hand

316
00:12:09,350 --> 00:12:06,959
it over to my associate mr chris edelman

317
00:12:10,629 --> 00:12:09,360
to tell you more about that

318
00:12:12,470 --> 00:12:10,639
thank you quasi

319
00:12:14,470 --> 00:12:12,480
uh first let me say i think it's quite

320
00:12:16,470 --> 00:12:14,480
fitting that this the final flight of

321
00:12:18,470 --> 00:12:16,480
the shuttle is exactly the type of

322
00:12:20,150 --> 00:12:18,480
missions that that its designers

323
00:12:22,550 --> 00:12:20,160
originally intended and that is to

324
00:12:25,750 --> 00:12:22,560
service a manned laboratory in low earth

325
00:12:27,829 --> 00:12:25,760
orbit the fir uh this is the 37th flight

326
00:12:30,470 --> 00:12:27,839
of the shuttle to the space station and

327
00:12:32,310 --> 00:12:30,480
the first flight was back in 1988 when

328
00:12:34,949 --> 00:12:32,320
endeavour delivered the first u.s

329
00:12:36,870 --> 00:12:34,959
element and attached it to the first

330
00:12:39,430 --> 00:12:36,880
russian element that had been launched

331
00:12:42,470 --> 00:12:39,440
so here we are 13 years later the the

332
00:12:43,829 --> 00:12:42,480
space station is now over 900 000 pounds

333
00:12:46,230 --> 00:12:43,839
it's uh it's bigger than a football

334
00:12:48,710 --> 00:12:46,240
field from end to end it's home to a

335
00:12:51,030 --> 00:12:48,720
multinational crew of six performing

336
00:12:52,389 --> 00:12:51,040
cutting-edge research in biology and

337
00:12:54,310 --> 00:12:52,399
medical science

338
00:12:56,629 --> 00:12:54,320

astronomy physics

339
00:12:58,629 --> 00:12:56,639
fluid and material science so

340
00:13:00,310 --> 00:12:58,639
the the space station

341
00:13:02,550 --> 00:13:00,320
largely has been lifted into orbit by

342
00:13:04,470 --> 00:13:02,560
the space shuttle it's been assembled by

343
00:13:06,310 --> 00:13:04,480
space walking crews from the space

344
00:13:09,269 --> 00:13:06,320
shuttle and it's been resupplied by the

345
00:13:10,550 --> 00:13:09,279
space shuttle over the years so uh

346
00:13:11,670 --> 00:13:10,560
the space station literally would not

347
00:13:14,470 --> 00:13:11,680
have been possible without the

348
00:13:15,190 --> 00:13:14,480
contribution of the space shuttle

349
00:13:17,990 --> 00:13:15,200
so

350
00:13:20,150 --> 00:13:18,000
again the main purpose of sts-135 is

351
00:13:22,150 --> 00:13:20,160
logistics bringing up the supplies that

352
00:13:23,750 --> 00:13:22,160
will provision the space station through

353
00:13:25,910 --> 00:13:23,760
the year 2012.

354
00:13:27,990 --> 00:13:25,920
that's a key date because

355
00:13:31,110 --> 00:13:28,000
our commercial cargo providers are going

356
00:13:32,470 --> 00:13:31,120
to be coming online in early 2012 and by

357
00:13:34,470 --> 00:13:32,480
providing the supplies we need to get

358
00:13:36,230 --> 00:13:34,480
through all of next year

359
00:13:37,750 --> 00:13:36,240
that will provide a little bit of a

360
00:13:39,910 --> 00:13:37,760
breathing room for the development as

361
00:13:41,910 --> 00:13:39,920
those companies and spacecraft enter

362
00:13:44,389 --> 00:13:41,920
their challenging flight test phase and

363
00:13:47,110 --> 00:13:44,399

of course our crews will continue to be

364
00:13:49,590 --> 00:13:47,120
rotated to and from the space station

365
00:13:51,590 --> 00:13:49,600
using soyuz spacecraft provided by the

366
00:13:53,670 --> 00:13:51,600
russians we uh we've been doing that

367
00:13:56,150 --> 00:13:53,680
exclusively on soyuz for space station

368
00:13:57,990 --> 00:13:56,160
crews for the past couple years

369
00:13:59,829 --> 00:13:58,000
in part because the soyuz serves as the

370
00:14:02,629 --> 00:13:59,839
lifeboat for the crews when they're on

371
00:14:04,949 --> 00:14:02,639
the space station

372
00:14:06,310 --> 00:14:04,959
so let me introduce you to the current

373
00:14:08,550 --> 00:14:06,320
residents of the space station if you

374
00:14:11,670 --> 00:14:08,560
can put the graphic up please

375
00:14:13,030 --> 00:14:11,680
this is the crew of expedition 28

376
00:14:14,790 --> 00:14:13,040
currently on the station and they'll be

377
00:14:16,710 --> 00:14:14,800
the crew members greening atlantis when

378
00:14:18,550 --> 00:14:16,720
she arrives in july

379
00:14:21,269 --> 00:14:18,560
starting from the left is satoshi

380
00:14:23,990 --> 00:14:21,279
furukawa of the japanese space agency

381
00:14:25,829 --> 00:14:24,000
he's a medical doctor and expedition 28

382
00:14:27,670 --> 00:14:25,839
is his first space flight

383
00:14:29,829 --> 00:14:27,680
next to him is nasa astronaut mike

384
00:14:32,310 --> 00:14:29,839
fossum he's a retired colonel from the

385
00:14:33,990 --> 00:14:32,320
u.s air force he's an eagle scout and an

386
00:14:36,150 --> 00:14:34,000
active scout master here in the with a

387
00:14:39,189 --> 00:14:36,160
troop here in the houston area mike was

388
00:14:40,790 --> 00:14:39,199

mission specialist on sts-121

389
00:14:43,310 --> 00:14:40,800
and 124

390
00:14:45,269 --> 00:14:43,320
and he has done three spacewalks on

391
00:14:47,829 --> 00:14:45,279
sts-124

392
00:14:50,710 --> 00:14:47,839
and next to mike is ron garan he's a

393
00:14:52,150 --> 00:14:50,720
former f-16 pilot and he was his

394
00:14:55,110 --> 00:14:52,160
previous flight experience was as

395
00:14:56,870 --> 00:14:55,120
mission specialist on sts-124

396
00:14:58,230 --> 00:14:56,880
with mike fossum and he actually

397
00:15:00,870 --> 00:14:58,240
performed three of those space walks

398
00:15:05,829 --> 00:15:03,670
next to ron is cosmonaut alexander

399
00:15:07,350 --> 00:15:05,839
samoya kitayev he's a lieutenant colonel

400
00:15:10,230 --> 00:15:07,360
in the russian air force and a flight

401
00:15:12,470 --> 00:15:10,240
engineer on expedition 27 and 28

402
00:15:14,790 --> 00:15:12,480
then next to him second from the right

403
00:15:16,629 --> 00:15:14,800
is sergei volkov he's also a colonel in

404
00:15:20,550 --> 00:15:16,639
the russian air force he's the former

405
00:15:23,990 --> 00:15:20,560
commander of expedition 17 back in 2008

406
00:15:26,550 --> 00:15:24,000
and he's also the commander of the 26 or

407
00:15:28,949 --> 00:15:26,560
correction the 27s soyuz

408
00:15:30,710 --> 00:15:28,959
vehicle uh that he flew up with ron and

409
00:15:32,389 --> 00:15:30,720
mike and they arrived at the space

410
00:15:34,069 --> 00:15:32,399
station in early june

411
00:15:38,069 --> 00:15:34,079
and finally on the right is the

412
00:15:40,230 --> 00:15:38,079
expedition 28 commander andre horisianco

413
00:15:42,230 --> 00:15:40,240

and he's the former flight director uh

414
00:15:44,710 --> 00:15:42,240
from the russian flight control center

415
00:15:47,590 --> 00:15:44,720
in moscow and he's been supporting space

416
00:15:48,550 --> 00:15:47,600
station operations since early april and

417
00:15:54,230 --> 00:15:48,560
he's the

418
00:15:56,310 --> 00:15:54,240
with ron and alexander and i believe i

419
00:15:59,749 --> 00:15:56,320
have a correction on uh

420
00:16:02,470 --> 00:15:59,759
sergey volkov as the 27s commander and

421
00:16:04,470 --> 00:16:02,480
he flew up with mike and satoshi

422
00:16:05,990 --> 00:16:04,480
so that's our crew on the space station

423
00:16:09,110 --> 00:16:06,000
they've been very busy the past couple

424
00:16:10,790 --> 00:16:09,120
weeks preparing for sts-135's arrival

425
00:16:12,389 --> 00:16:10,800
they've been gathering the cargo that's

426
00:16:14,470 --> 00:16:12,399
going to be returned in the

427
00:16:16,150 --> 00:16:14,480
multi-purpose logistics module they've

428
00:16:18,790 --> 00:16:16,160
been checking out their spacesuits so

429
00:16:20,550 --> 00:16:18,800
they did a dress rehearsal last week to

430
00:16:22,069 --> 00:16:20,560
assess the fit of their spacesuits and

431
00:16:23,829 --> 00:16:22,079
practice some of their procedures

432
00:16:25,990 --> 00:16:23,839
they've been doing a lot of self-study

433
00:16:28,150 --> 00:16:26,000
to prepare for the spacewalk and for

434
00:16:30,230 --> 00:16:28,160
example this morning they swapped out

435
00:16:31,829 --> 00:16:30,240
the air conditioner in node 2 the

436
00:16:33,590 --> 00:16:31,839
harmony module

437
00:16:34,949 --> 00:16:33,600
in order to prepare the heat exchanger

438
00:16:36,870 --> 00:16:34,959

and that air conditioner for return on

439
00:16:38,870 --> 00:16:36,880
the shuttle

440
00:16:40,230 --> 00:16:38,880
so supporting the space station crew

441
00:16:42,230 --> 00:16:40,240
will be

442
00:16:43,829 --> 00:16:42,240
three flight control teams in the space

443
00:16:45,829 --> 00:16:43,839
station control room

444
00:16:48,870 --> 00:16:45,839
i'll be leading the orbit 2 team we'll

445
00:16:51,509 --> 00:16:48,880
be running things from the midday during

446
00:16:53,749 --> 00:16:51,519
the crew day towards

447
00:16:55,910 --> 00:16:53,759
their pre-sleep time frame

448
00:16:58,629 --> 00:16:55,920
if we put up the graphic jerry jason is

449
00:17:00,310 --> 00:16:58,639
our orbit one flight director he'll be

450
00:17:02,230 --> 00:17:00,320
leading at the team during the crew

451
00:17:04,150 --> 00:17:02,240
morning from a couple hours before wake

452
00:17:06,549 --> 00:17:04,160
up until the midday meal and then

453
00:17:08,230 --> 00:17:06,559
courtney mcmillan is our orbit 3 flight

454
00:17:10,069 --> 00:17:08,240
director she'll be in charge of the

455
00:17:11,829 --> 00:17:10,079
planning team they'll watch over the

456
00:17:15,510 --> 00:17:11,839
vehicle while the crew's asleep at night

457
00:17:17,750 --> 00:17:15,520
and re-plan the next day's activities

458
00:17:19,590 --> 00:17:17,760
so back to the timeline where we left

459
00:17:21,909 --> 00:17:19,600
off was uh the end of flight day three

460
00:17:24,470 --> 00:17:21,919
we had the shuttle safely docked the uh

461
00:17:26,470 --> 00:17:24,480
the obsessed uh transferred to the to

462
00:17:28,950 --> 00:17:26,480
the shuttle arm and now we can get into

463
00:17:31,110 --> 00:17:28,960

the the the joint mission flight day

464
00:17:32,789 --> 00:17:31,120
four our first full joint day in the

465
00:17:34,549 --> 00:17:32,799
mission we'll commence the cargo

466
00:17:36,070 --> 00:17:34,559
transfer operations we'll be

467
00:17:38,630 --> 00:17:36,080
transferring first

468
00:17:41,029 --> 00:17:38,640
about 2100 pounds of cargo from the mid

469
00:17:43,270 --> 00:17:41,039
deck of atlantis over to the space

470
00:17:45,590 --> 00:17:43,280
station and then we'll prepare to

471
00:17:48,150 --> 00:17:45,600
install the rafaello multi-purpose

472
00:17:50,390 --> 00:17:48,160
logistics module on the station now the

473
00:17:52,870 --> 00:17:50,400
type of cargo that we're bringing up is

474
00:17:54,310 --> 00:17:52,880
just the type of thing any of you would

475
00:17:56,950 --> 00:17:54,320
plan for if you were in charge of

476
00:17:59,110 --> 00:17:56,960
outfitting a research station at some

477
00:18:01,590 --> 00:17:59,120
remote location such as antarctica we're

478
00:18:03,669 --> 00:18:01,600
bringing up crew supplies such as food

479
00:18:05,669 --> 00:18:03,679
and clothing we're also bringing up

480
00:18:08,390 --> 00:18:05,679
critical spare parts

481
00:18:10,710 --> 00:18:08,400
for for any unanticipated failures and

482
00:18:12,630 --> 00:18:10,720
we're also bringing up science supplies

483
00:18:14,950 --> 00:18:12,640
and experiments so just to run down

484
00:18:17,990 --> 00:18:14,960
through some of the specific numbers

485
00:18:19,230 --> 00:18:18,000
in the multi-purpose logistics module

486
00:18:21,669 --> 00:18:19,240
we'll be carrying up

487
00:18:23,909 --> 00:18:21,679
8150 pounds of cargo

488
00:18:26,390 --> 00:18:23,919

and the totals including rafaello and

489
00:18:28,710 --> 00:18:26,400
the mid deck for food and crew support

490
00:18:30,070 --> 00:18:28,720
items is twenty six hundred and eighty

491
00:18:31,909 --> 00:18:30,080
pounds

492
00:18:33,990 --> 00:18:31,919
and four thousand three hundred and

493
00:18:34,950 --> 00:18:34,000
forty pounds of spare parts for the

494
00:18:36,470 --> 00:18:34,960
station

495
00:18:37,990 --> 00:18:36,480
and one thousand seven hundred and

496
00:18:40,470 --> 00:18:38,000
eighty pounds of science gear for

497
00:18:41,750 --> 00:18:40,480
utilization and just a couple specific

498
00:18:43,270 --> 00:18:41,760
examples there

499
00:18:45,750 --> 00:18:43,280
one of the new spare parts that we're

500
00:18:47,909 --> 00:18:45,760
bringing up

501
00:18:49,669 --> 00:18:47,919
to enhance our urine recycling system is

502
00:18:51,830 --> 00:18:49,679
the advanced recycle filter tank

503
00:18:54,549 --> 00:18:51,840
assembly our current filters that are

504
00:18:56,390 --> 00:18:54,559
used to to filter urine and turn that

505
00:18:58,870 --> 00:18:56,400
into drinking water that can be used

506
00:19:00,710 --> 00:18:58,880
over and over again is uh these are

507
00:19:01,990 --> 00:19:00,720
throw away filters that they're used

508
00:19:04,150 --> 00:19:02,000
only once they're either discarded or

509
00:19:07,110 --> 00:19:04,160
brought back to earth and refurbished

510
00:19:10,070 --> 00:19:07,120
the advanced filter tank assembly will

511
00:19:11,750 --> 00:19:10,080
allow us to to reuse the hardware over

512
00:19:13,669 --> 00:19:11,760
and over again we'll essentially take

513
00:19:16,710 --> 00:19:13,679

the brine the yucky stuff and offload

514
00:19:18,549 --> 00:19:16,720
that into disposable uh canisters or the

515
00:19:20,789 --> 00:19:18,559
uh the waste tanks of progress

516
00:19:22,950 --> 00:19:20,799
spacecraft and then dispose of that so

517
00:19:25,830 --> 00:19:22,960
so essentially the advanced uh raft as

518
00:19:27,590 --> 00:19:25,840
it's called will will uh allow us to uh

519
00:19:30,150 --> 00:19:27,600
to decrease our reliance on ground

520
00:19:32,470 --> 00:19:30,160
resupply another example is the amine

521
00:19:34,789 --> 00:19:32,480
swingbed this is uh this is a co2

522
00:19:36,390 --> 00:19:34,799
scrubber it's an advanced demonstrator

523
00:19:38,150 --> 00:19:36,400
for for new

524
00:19:40,070 --> 00:19:38,160
ways to scrub carbon dioxide from the

525
00:19:42,789 --> 00:19:40,080
air is to to demonstrate technology that

526
00:19:44,310 --> 00:19:42,799
we'll need for for future spacecraft and

527
00:19:46,710 --> 00:19:44,320
also we're bringing up an ultrasound

528
00:19:49,190 --> 00:19:46,720
machine this will be used for

529
00:19:50,830 --> 00:19:49,200
studies to determine the effects of

530
00:19:53,430 --> 00:19:50,840
microgravity on the astronauts

531
00:19:55,270 --> 00:19:53,440
physiology there's a lot of applications

532
00:19:57,029 --> 00:19:55,280
for this study because the the

533
00:19:59,990 --> 00:19:57,039
astronauts bones and muscles tend to

534
00:20:01,430 --> 00:20:00,000
degrade over time similar to how

535
00:20:03,190 --> 00:20:01,440
what occurs to people on earth when

536
00:20:05,510 --> 00:20:03,200
they're subject to bed rest or the

537
00:20:07,029 --> 00:20:05,520
elderly with osteoporosis so

538
00:20:08,870 --> 00:20:07,039

we're bringing up a lot of a lot of

539
00:20:11,909 --> 00:20:08,880
really interesting gear for technology

540
00:20:14,390 --> 00:20:11,919
demonstration and scientific study

541
00:20:16,230 --> 00:20:14,400
so next i'd like to show you a view of

542
00:20:19,190 --> 00:20:16,240
the multi-purpose logistics module we

543
00:20:22,870 --> 00:20:19,200
have a video of the mplm at the space

544
00:20:25,990 --> 00:20:22,880
station processing facility at ksc

545
00:20:29,830 --> 00:20:26,000
the uh the nplm is built in italy it was

546
00:20:31,750 --> 00:20:29,840
last flown on sts-114 back in 2005. and

547
00:20:34,310 --> 00:20:31,760
you can see inside the module there are

548
00:20:36,789 --> 00:20:34,320
there are attach points where standard

549
00:20:38,310 --> 00:20:36,799
sized racks are mounted and you can see

550
00:20:40,230 --> 00:20:38,320
the racks across the top of the view

551
00:20:41,590 --> 00:20:40,240
there we'll be flying three different

552
00:20:43,510 --> 00:20:41,600
types of racks they're each about the

553
00:20:46,549 --> 00:20:43,520
size of a refrigerator and in this

554
00:20:49,110 --> 00:20:46,559
graphic the first type is the resupply

555
00:20:51,190 --> 00:20:49,120
stowage rack on the top and bottom there

556
00:20:53,110 --> 00:20:51,200
those are essentially drawer type racks

557
00:20:54,470 --> 00:20:53,120
used for small items such as food and

558
00:20:55,909 --> 00:20:54,480
clothing you can think of that

559
00:20:58,390 --> 00:20:55,919
essentially as your dresser drawer in

560
00:21:00,549 --> 00:20:58,400
your bedroom on the sides there we have

561
00:21:03,190 --> 00:21:00,559
resupply stowage platforms that are used

562
00:21:05,350 --> 00:21:03,200
to hold oversized cargo

563
00:21:07,430 --> 00:21:05,360

specifically our spare parts and then at

564
00:21:10,310 --> 00:21:07,440
the top there was a view of another

565
00:21:12,710 --> 00:21:10,320
flat supply platform the international

566
00:21:15,590 --> 00:21:12,720
standard payload rack which again is

567
00:21:17,430 --> 00:21:15,600
used for oversized payload type items on

568
00:21:19,350 --> 00:21:17,440
the end cone we're going to have 12 crew

569
00:21:21,830 --> 00:21:19,360
transfer bags mounted

570
00:21:24,230 --> 00:21:21,840
so again a view back inside the mplm you

571
00:21:26,710 --> 00:21:24,240
can see some of the transfer racks

572
00:21:28,789 --> 00:21:26,720
that are mounted in the in the module

573
00:21:31,110 --> 00:21:28,799
again that are used to hold the cargo

574
00:21:32,950 --> 00:21:31,120
here's an example of a cargo transfer

575
00:21:38,230 --> 00:21:32,960
bag getting ready to be loaded in by the

576
00:21:42,789 --> 00:21:39,909
and that's the the end cone of the

577
00:21:45,430 --> 00:21:42,799
logistics module and we have several uh

578
00:21:48,310 --> 00:21:45,440
again 12 of those bags will include food

579
00:21:50,230 --> 00:21:48,320
clothing gps antennas and some spare

580
00:21:52,149 --> 00:21:50,240
printers here's an example of the

581
00:21:54,149 --> 00:21:52,159
resupply storage platform you can see

582
00:21:56,310 --> 00:21:54,159
the the back side of that platform is

583
00:21:59,190 --> 00:21:56,320
loaded with cargo again inside those

584
00:22:02,549 --> 00:21:59,200
transfer bags are spare parts they're

585
00:22:05,430 --> 00:22:02,559
packed in foam and then put into a nomex

586
00:22:07,669 --> 00:22:05,440
transfer container they're secured onto

587
00:22:10,789 --> 00:22:07,679
the platform and then a special machine

588
00:22:12,310 --> 00:22:10,799

loads it into the mplm

589
00:22:13,990 --> 00:22:12,320
once it's uh and just to give you a

590
00:22:15,270 --> 00:22:14,000
couple of specific examples of the car

591
00:22:17,669 --> 00:22:15,280
the spare parts there that are going to

592
00:22:19,350 --> 00:22:17,679
be on the the vertical platforms are we

593
00:22:21,990 --> 00:22:19,360
have a new distillation assembly for our

594
00:22:23,750 --> 00:22:22,000
urine processor we have a new gyro for

595
00:22:25,830 --> 00:22:23,760
the tevus treadmill

596
00:22:28,549 --> 00:22:25,840
and a new charcoal bed coming up for our

597
00:22:30,470 --> 00:22:28,559
air purifier and here's the technicians

598
00:22:32,390 --> 00:22:30,480
installing

599
00:22:34,789 --> 00:22:32,400
one of the spare parts on the front side

600
00:22:37,029 --> 00:22:34,799
of the rack and in orbit basically it'll

601
00:22:39,029 --> 00:22:37,039
be the opposite process the crew will

602
00:22:41,110 --> 00:22:39,039
unload the front side first and then

603
00:22:43,029 --> 00:22:41,120
tilt the rack to access the backside

604
00:22:45,029 --> 00:22:43,039
here's our crew at kennedy space center

605
00:22:47,350 --> 00:22:45,039
earlier this month they came down to

606
00:22:49,909 --> 00:22:47,360
inspect the module and the cargo and to

607
00:22:52,630 --> 00:22:49,919
review their their transfer plan

608
00:22:54,870 --> 00:22:52,640
and on june 13th the module was

609
00:22:56,710 --> 00:22:54,880
completely loaded hatch was closed and

610
00:22:58,230 --> 00:22:56,720
sealed up and then it was inserted into

611
00:23:01,909 --> 00:22:58,240
the payload canister

612
00:23:06,149 --> 00:23:03,830
so on june 20th

613
00:23:08,470 --> 00:23:06,159

rafaela was delivered to the launch pad

614
00:23:10,470 --> 00:23:08,480
you can see atlantis there

615
00:23:12,070 --> 00:23:10,480
it was lifted up into the rotating

616
00:23:14,310 --> 00:23:12,080
service structure and this is a really

617
00:23:16,470 --> 00:23:14,320
neat process because the the module is

618
00:23:18,390 --> 00:23:16,480
extracted from the payload canister into

619
00:23:20,310 --> 00:23:18,400
the room there in the uh

620
00:23:21,270 --> 00:23:20,320
in the back side of the rotating service

621
00:23:23,430 --> 00:23:21,280
structure

622
00:23:25,190 --> 00:23:23,440
and then the entire that entire gray

623
00:23:27,029 --> 00:23:25,200
structure is rotated over to cover the

624
00:23:28,870 --> 00:23:27,039
payload bay and then in a clean

625
00:23:30,870 --> 00:23:28,880
environment the shuttle payload bay

626
00:23:33,110 --> 00:23:30,880
doors are opened and the mplm was

627
00:23:34,710 --> 00:23:33,120
transferred into the payload bay so uh

628
00:23:36,710 --> 00:23:34,720
that's where rafaela is right now

629
00:23:39,830 --> 00:23:36,720
awaiting launch the weight of the

630
00:23:41,590 --> 00:23:39,840
logistics module is 25 400 pounds that's

631
00:23:43,990 --> 00:23:41,600
the second heaviest mplm that we've

632
00:23:46,470 --> 00:23:44,000
launched but uh we are carrying the most

633
00:23:49,029 --> 00:23:46,480
cargo on this flight than we've ever

634
00:23:51,110 --> 00:23:49,039
carried before in an mplm

635
00:23:53,909 --> 00:23:51,120
so uh next i'll show you a video of how

636
00:23:57,029 --> 00:23:53,919
we get raphaelo from the payload bay

637
00:23:58,710 --> 00:23:57,039
onto station if you can roll that video

638
00:23:59,510 --> 00:23:58,720

this will be the morning of flight day

639
00:24:02,390 --> 00:23:59,520
four

640
00:24:04,070 --> 00:24:02,400
our robotics operators sandy magnus and

641
00:24:05,750 --> 00:24:04,080
doug hurley will be located in this

642
00:24:08,310 --> 00:24:05,760
cupola on the space station where you

643
00:24:09,990 --> 00:24:08,320
see the blinking windows they have a the

644
00:24:12,630 --> 00:24:10,000
controls there to drive the station

645
00:24:14,549 --> 00:24:12,640
robotic arm the canadarm2 they'll move

646
00:24:17,269 --> 00:24:14,559
in and grasp the nplm and carefully

647
00:24:19,269 --> 00:24:17,279
extract it from the payload bay

648
00:24:21,029 --> 00:24:19,279
this is the view that doug and sandy

649
00:24:23,590 --> 00:24:21,039
will see when they're working in the

650
00:24:25,269 --> 00:24:23,600
in the cupola you can see they have

651
00:24:29,909 --> 00:24:25,279
good views out the window they also have

652
00:24:34,230 --> 00:24:31,909
they'll maneuver the module

653
00:24:37,350 --> 00:24:34,240
up to the node 2 or

654
00:24:38,789 --> 00:24:37,360
harmony node the earth-facing port there

655
00:24:41,029 --> 00:24:38,799
they'll maneuver it into position so

656
00:24:42,470 --> 00:24:41,039
that the common berthing mechanism

657
00:24:43,909 --> 00:24:42,480
latches just a few inches from the

658
00:24:46,310 --> 00:24:43,919
interface that there will be four

659
00:24:47,590 --> 00:24:46,320
latches that will grab the module and

660
00:24:50,710 --> 00:24:47,600
we'll pull it in

661
00:24:53,110 --> 00:24:50,720
to uh to connect the mplm to the station

662
00:24:56,310 --> 00:24:53,120
then the crew will drive 16 bolts to

663
00:24:57,909 --> 00:24:56,320

secure the mplm and then get an airtight

664
00:25:00,149 --> 00:24:57,919
seal

665
00:25:02,149 --> 00:25:00,159
after after that sandy doug will

666
00:25:05,430 --> 00:25:02,159
maneuver the arm to the uh start

667
00:25:07,830 --> 00:25:05,440
position for eva uh the next day

668
00:25:10,070 --> 00:25:07,840
so after the mplm is firmly attached to

669
00:25:12,230 --> 00:25:10,080
the station the crew will go into node

670
00:25:14,549 --> 00:25:12,240
two and they'll open that lower

671
00:25:15,909 --> 00:25:14,559
earth-facing hatch

672
00:25:18,070 --> 00:25:15,919
then they will perform what we call

673
00:25:20,549 --> 00:25:18,080
vestibule outfitting they'll connect the

674
00:25:22,310 --> 00:25:20,559
electrical data and power jumpers so

675
00:25:24,950 --> 00:25:22,320
that they can activate the

676
00:25:26,630 --> 00:25:24,960
mplm they'll also install air ducting

677
00:25:29,590 --> 00:25:26,640
and then they'll actually open the hatch

678
00:25:31,350 --> 00:25:29,600
go into rafaello and begin the the cargo

679
00:25:33,750 --> 00:25:31,360
transfer process

680
00:25:35,269 --> 00:25:33,760
meanwhile our space walkers for the next

681
00:25:36,870 --> 00:25:35,279
day

682
00:25:39,190 --> 00:25:36,880
mike fossum and ron garan will be

683
00:25:41,110 --> 00:25:39,200
working with rex walheim transferring

684
00:25:43,830 --> 00:25:41,120
the cargo that they need for the

685
00:25:45,590 --> 00:25:43,840
spacewalk from the middeck of atlantis

686
00:25:48,230 --> 00:25:45,600
into the space station they'll be doing

687
00:25:49,669 --> 00:25:48,240
their final tool verification and then

688
00:25:51,269 --> 00:25:49,679

at the end of the day the entire crew

689
00:25:52,149 --> 00:25:51,279
will have an eva conference to review

690
00:25:57,350 --> 00:25:52,159
the

691
00:25:59,269 --> 00:25:57,360
so that takes us to flight day five and

692
00:26:01,190 --> 00:25:59,279
the focus of flight day five will be the

693
00:26:01,909 --> 00:26:01,200
eva itself

694
00:26:03,350 --> 00:26:01,919
just to give you a little bit of

695
00:26:04,710 --> 00:26:03,360
background on how we're gonna conduct

696
00:26:07,830 --> 00:26:04,720
this this will be the first shuttle

697
00:26:10,070 --> 00:26:07,840
mission where the eda is performed by

698
00:26:12,470 --> 00:26:10,080
the space station crew the reason we did

699
00:26:15,029 --> 00:26:12,480
that is because with a a small shuttle

700
00:26:17,190 --> 00:26:15,039
crew of four we wanted to offload the

701
00:26:19,430 --> 00:26:17,200
training tasks on the shuttle crew and

702
00:26:22,390 --> 00:26:19,440
sort of level the load so we took

703
00:26:24,149 --> 00:26:22,400
advantage of the the eva experience of

704
00:26:25,590 --> 00:26:24,159
mike fossum and ron guerin as i

705
00:26:27,669 --> 00:26:25,600
mentioned before they've actually done

706
00:26:30,870 --> 00:26:27,679
three space walks together on a previous

707
00:26:31,990 --> 00:26:30,880
shuttle mission so uh uh mike and ron

708
00:26:33,269 --> 00:26:32,000
together

709
00:26:35,830 --> 00:26:33,279
were able to get up to speed very

710
00:26:37,750 --> 00:26:35,840
quickly on the cva and uh in that way we

711
00:26:39,590 --> 00:26:37,760
relieved the shuttle crew from having to

712
00:26:41,669 --> 00:26:39,600
also add that to their very busy

713
00:26:43,190 --> 00:26:41,679

training schedule now uh during the

714
00:26:44,710 --> 00:26:43,200
spacewalk that

715
00:26:47,430 --> 00:26:44,720
again it'll be mike and ron going

716
00:26:49,830 --> 00:26:47,440
outside but supporting them in the

717
00:26:52,149 --> 00:26:49,840
in the space station will be

718
00:26:54,310 --> 00:26:52,159
again sandy magnus and doug hurley

719
00:26:56,070 --> 00:26:54,320
driving the station robot arm to support

720
00:26:58,630 --> 00:26:56,080
the eva

721
00:27:00,630 --> 00:26:58,640
chris ferguson and satoshi furukawa will

722
00:27:02,390 --> 00:27:00,640
be assisting with

723
00:27:04,390 --> 00:27:02,400
mike and ron getting in and out of their

724
00:27:06,070 --> 00:27:04,400
suits before and after the eva

725
00:27:08,549 --> 00:27:06,080
and rex walheim will be on the aft

726
00:27:11,510 --> 00:27:08,559
flight deck of atlantis overseeing the

727
00:27:13,110 --> 00:27:11,520
eva and uh providing the uh the ev crew

728
00:27:15,669 --> 00:27:13,120
members specific instructions and

729
00:27:17,110 --> 00:27:15,679
choreography on the eva as the as they

730
00:27:18,070 --> 00:27:17,120
go through the six and a half hour space

731
00:27:20,470 --> 00:27:18,080
walk

732
00:27:22,230 --> 00:27:20,480
um just to give you

733
00:27:24,630 --> 00:27:22,240
an overview of what the primary

734
00:27:25,750 --> 00:27:24,640
objectives are we are going to return

735
00:27:28,470 --> 00:27:25,760
the uh

736
00:27:30,470 --> 00:27:28,480
the failed pump module it's an ammonia

737
00:27:33,190 --> 00:27:30,480
pump module that supports the space

738
00:27:36,389 --> 00:27:33,200

station external thermal control system

739
00:27:38,470 --> 00:27:36,399
this failed back uh on july 30th uh last

740
00:27:39,990 --> 00:27:38,480
year i remember because i was on console

741
00:27:42,389 --> 00:27:40,000
when it failed it was one of those

742
00:27:44,070 --> 00:27:42,399
moments where on a quiet saturday and

743
00:27:45,669 --> 00:27:44,080
the crew's off duty and getting ready to

744
00:27:47,269 --> 00:27:45,679
go to bed and everything's going real

745
00:27:49,909 --> 00:27:47,279
well and then it all changed in a second

746
00:27:51,669 --> 00:27:49,919
when that pump module failed all the uh

747
00:27:53,269 --> 00:27:51,679
caution warnings started going off and

748
00:27:56,630 --> 00:27:53,279
the ground and the crew had to very

749
00:27:58,149 --> 00:27:56,640
quickly scramble to reconfigure uh the

750
00:28:00,389 --> 00:27:58,159
systems and power down some of the

751
00:28:02,789 --> 00:28:00,399
systems in order to keep the shuttle

752
00:28:04,630 --> 00:28:02,799
limping along on one remaining

753
00:28:07,350 --> 00:28:04,640
cooling loop we have two loop cooling

754
00:28:09,510 --> 00:28:07,360
loops on the space station so that was a

755
00:28:10,950 --> 00:28:09,520
major failure in in the uh in the

756
00:28:13,510 --> 00:28:10,960
history of the space station program was

757
00:28:14,950 --> 00:28:13,520
the first major failure that required

758
00:28:16,630 --> 00:28:14,960
space walks

759
00:28:18,310 --> 00:28:16,640
without a shuttle present to fix the

760
00:28:20,630 --> 00:28:18,320
problem it actually took three

761
00:28:22,470 --> 00:28:20,640
spacewalks to uh to remove the failed

762
00:28:24,149 --> 00:28:22,480
pump module and install the new one and

763
00:28:25,990 --> 00:28:24,159

that was actually those uh spacewalks

764
00:28:27,510 --> 00:28:26,000
were actually led by one of the flight

765
00:28:29,669 --> 00:28:27,520
directors on our team the orbit three

766
00:28:33,350 --> 00:28:29,679
flight director courtney mcmillan

767
00:28:35,830 --> 00:28:33,360
so uh on sts-133 just earlier this year

768
00:28:38,389 --> 00:28:35,840
that pump module was moved into position

769
00:28:40,230 --> 00:28:38,399
on external stowage platform number two

770
00:28:42,149 --> 00:28:40,240
it has been vented of all its ammonia

771
00:28:43,990 --> 00:28:42,159
it's now an inert uh

772
00:28:45,669 --> 00:28:44,000
payload essentially that will be brought

773
00:28:47,669 --> 00:28:45,679
back on the shuttle and we'll be very

774
00:28:50,230 --> 00:28:47,679
interested to see uh to examine that and

775
00:28:52,470 --> 00:28:50,240
to see what exactly uh was the failure

776
00:28:54,950 --> 00:28:52,480
mechanism we do have spares on orbit

777
00:28:56,870 --> 00:28:54,960
still but we we do want to understand uh

778
00:28:58,389 --> 00:28:56,880
what happened with the pump module our

779
00:29:00,549 --> 00:28:58,399
next major objective

780
00:29:02,870 --> 00:29:00,559
with the eva as quatzi mentioned is to

781
00:29:05,750 --> 00:29:02,880
install the robotics refueling mission

782
00:29:07,269 --> 00:29:05,760
we can roll that video

783
00:29:08,549 --> 00:29:07,279
this is again as a technology

784
00:29:10,710 --> 00:29:08,559
demonstrator

785
00:29:12,230 --> 00:29:10,720
to demonstrate the techniques and the

786
00:29:14,870 --> 00:29:12,240
tools and the procedures that will be

787
00:29:15,990 --> 00:29:14,880
used to perform in-flight refueling of

788
00:29:17,350 --> 00:29:16,000

satellites

789
00:29:19,029 --> 00:29:17,360
the what we're going to do during the

790
00:29:21,510 --> 00:29:19,039
eva is that the crew is going to remove

791
00:29:23,750 --> 00:29:21,520
it from that lmc bridge they're going to

792
00:29:26,230 --> 00:29:23,760
install it on the outside of the station

793
00:29:29,430 --> 00:29:26,240
and then over the next two years our

794
00:29:32,070 --> 00:29:29,440
spdm our special purpose multi

795
00:29:33,510 --> 00:29:32,080
special purpose dexterous manipulator or

796
00:29:37,350 --> 00:29:33,520
dexter

797
00:29:38,470 --> 00:29:37,360
will will use the tools there in rrm to

798
00:29:39,750 --> 00:29:38,480
practice

799
00:29:42,310 --> 00:29:39,760
and demonstrate the techniques to

800
00:29:45,830 --> 00:29:42,320
perform orbital refueling there's even a

801
00:29:47,430 --> 00:29:45,840
simulated liquid fuel system in rrm that

802
00:29:50,710 --> 00:29:47,440
dexter is going to actually use to

803
00:29:53,190 --> 00:29:50,720
transfer fuel between tanks

804
00:29:54,789 --> 00:29:53,200
another objective of the eva is to

805
00:29:57,190 --> 00:29:54,799
install the

806
00:29:59,190 --> 00:29:57,200
oremate

807
00:30:01,510 --> 00:29:59,200
stowage platform ormate stands for

808
00:30:03,830 --> 00:30:01,520
optical reflector materials experiment

809
00:30:05,909 --> 00:30:03,840
these are samples of various optical

810
00:30:07,269 --> 00:30:05,919
materials and we want to scientists want

811
00:30:09,110 --> 00:30:07,279
to understand how

812
00:30:11,190 --> 00:30:09,120
exposure to the space environment

813
00:30:13,990 --> 00:30:11,200

affects those materials this actually

814
00:30:16,230 --> 00:30:14,000
went up recently on sts-134

815
00:30:18,870 --> 00:30:16,240
but because its mounting location is

816
00:30:20,789 --> 00:30:18,880
close to the ams the alpha

817
00:30:24,149 --> 00:30:20,799
magnetic spectrometer there was a

818
00:30:25,909 --> 00:30:24,159
concern that the the insulation on ams

819
00:30:28,389 --> 00:30:25,919
could as it out gases for the first

820
00:30:31,190 --> 00:30:28,399
couple weeks on orbit it could uh

821
00:30:33,830 --> 00:30:31,200
contaminate these samples so uh decision

822
00:30:34,830 --> 00:30:33,840
was made to delay the installment until

823
00:30:37,909 --> 00:30:34,840
the flight of

824
00:30:40,230 --> 00:30:37,919
atlantis and we have a few what we call

825
00:30:42,070 --> 00:30:40,240
get ahead objectives on the eva these

826
00:30:44,149 --> 00:30:42,080
these are things that we

827
00:30:47,430 --> 00:30:44,159
if we have time available at the end of

828
00:30:49,190 --> 00:30:47,440
the eva we will perform our top priority

829
00:30:52,870 --> 00:30:49,200
get ahead item is installment of a

830
00:30:55,029 --> 00:30:52,880
thermal cover on the pma3 port that's

831
00:30:56,870 --> 00:30:55,039
shown in this graphic there's uh the

832
00:30:59,110 --> 00:30:56,880
thermal cover what fit over the the

833
00:31:00,950 --> 00:30:59,120
mouth of that pma and what the purpose

834
00:31:04,310 --> 00:31:00,960
of that is to

835
00:31:07,190 --> 00:31:04,320
shield a pressure equalization valve on

836
00:31:09,830 --> 00:31:07,200
the hatch on pma3 this hatch when it's

837
00:31:11,110 --> 00:31:09,840
exposed to direct sunlight overheats and

838
00:31:13,190 --> 00:31:11,120

it's degrading the seal life and it

839
00:31:15,909 --> 00:31:13,200
could eventually lead to to an air leak

840
00:31:18,070 --> 00:31:15,919
in that in the pma so we want to get the

841
00:31:20,310 --> 00:31:18,080
thermal cover in place to provide a more

842
00:31:22,870 --> 00:31:20,320
favorable thermal environment and

843
00:31:26,230 --> 00:31:22,880
another get ahead if we have time will

844
00:31:29,029 --> 00:31:26,240
be to complete the activation of

845
00:31:32,470 --> 00:31:29,039
a power and data grapple fixture on the

846
00:31:36,710 --> 00:31:32,480
fgb or zarya module this work was uh was

847
00:31:38,470 --> 00:31:36,720
started on the recent mission sts-134

848
00:31:41,029 --> 00:31:38,480
a couple of outstanding tasks are to

849
00:31:43,430 --> 00:31:41,039
complete the data and power jumper

850
00:31:45,029 --> 00:31:43,440
mating so that we we can so that this

851
00:31:47,190 --> 00:31:45,039
can become a usable

852
00:31:49,669 --> 00:31:47,200
base for their station robotic arm there

853
00:31:52,230 --> 00:31:49,679
was also a problem identified where a

854
00:31:53,990 --> 00:31:52,240
there appears to be a wire in one of the

855
00:31:55,509 --> 00:31:54,000
capture latch doors and that's shown in

856
00:31:57,350 --> 00:31:55,519
the next figure they're circling in

857
00:31:59,350 --> 00:31:57,360
yellow the crew is going to go in and

858
00:32:01,909 --> 00:31:59,360
clear that wire out of the way again so

859
00:32:03,509 --> 00:32:01,919
we have a new base for the station arm

860
00:32:05,669 --> 00:32:03,519
as you know the station arm can walk

861
00:32:08,950 --> 00:32:05,679
around station sort of like an inch worm

862
00:32:10,470 --> 00:32:08,960
and it uh uses these uh pdgf's as as

863
00:32:12,230 --> 00:32:10,480

basing points where it latches down

864
00:32:14,310 --> 00:32:12,240
structurally and it has electrical and

865
00:32:15,430 --> 00:32:14,320
data in command interfaces so that it

866
00:32:17,110 --> 00:32:15,440
can be driven from any of those

867
00:32:18,870 --> 00:32:17,120
locations

868
00:32:21,269 --> 00:32:18,880
so um later this morning you're going to

869
00:32:22,710 --> 00:32:21,279
get a brief from our lead eva officer

870
00:32:26,950 --> 00:32:22,720
glenda brown and she's going to fill you

871
00:32:28,710 --> 00:32:26,960
in on all the details of the spacewalk

872
00:32:29,830 --> 00:32:28,720
that takes us to the end of flight day

873
00:32:31,909 --> 00:32:29,840
five

874
00:32:34,389 --> 00:32:31,919
flight days six through nine are going

875
00:32:36,789 --> 00:32:34,399
to look uh very similar those days are

876
00:32:39,110 --> 00:32:36,799
focused on the the heavy lifting of the

877
00:32:41,909 --> 00:32:39,120
uh the cargo moving all the cargo out of

878
00:32:44,149 --> 00:32:41,919
the nplm into the station and then

879
00:32:45,909 --> 00:32:44,159
repacking it that process basically

880
00:32:47,909 --> 00:32:45,919
involves uh every day the crew is going

881
00:32:49,430 --> 00:32:47,919
to wake up and and they'll have received

882
00:32:51,669 --> 00:32:49,440
from our teams working overnight they'll

883
00:32:54,630 --> 00:32:51,679
receive a transfer list that tells them

884
00:32:56,389 --> 00:32:54,640
specifically uh which items to transfer

885
00:32:58,549 --> 00:32:56,399
where they're located in the logistics

886
00:33:00,950 --> 00:32:58,559
module where each of those parts go on

887
00:33:02,630 --> 00:33:00,960
the station we keep very careful track

888
00:33:04,549 --> 00:33:02,640

of where material is stowed on the

889
00:33:06,870 --> 00:33:04,559
station because it's with an internal

890
00:33:08,789 --> 00:33:06,880
volume the size of a 747 it's very easy

891
00:33:10,870 --> 00:33:08,799
to lose things

892
00:33:13,509 --> 00:33:10,880
they'll also be performing some

893
00:33:15,669 --> 00:33:13,519
maintenance type tasks for example we

894
00:33:18,230 --> 00:33:15,679
hope to install the ultrasound and all

895
00:33:19,669 --> 00:33:18,240
the uh the supporting hardware that goes

896
00:33:22,149 --> 00:33:19,679
with that

897
00:33:24,389 --> 00:33:22,159
in the in the space station

898
00:33:26,470 --> 00:33:24,399
and also a couple of unique items that

899
00:33:28,230 --> 00:33:26,480
i'll just call out on flight day six

900
00:33:30,389 --> 00:33:28,240
that's the day where we will perform

901
00:33:32,149 --> 00:33:30,399
focused inspection if it's required

902
00:33:33,909 --> 00:33:32,159
klotzin mentioned that

903
00:33:35,750 --> 00:33:33,919
we'll perform the the arbor pitch

904
00:33:37,750 --> 00:33:35,760
maneuver during rendezvous and also the

905
00:33:41,110 --> 00:33:37,760
flight day two inspection if there are

906
00:33:43,269 --> 00:33:41,120
any areas of concern uh we can go in and

907
00:33:45,990 --> 00:33:43,279
on on flight day six we can go in and

908
00:33:48,630 --> 00:33:46,000
use the orbiter boom sensor system to uh

909
00:33:51,190 --> 00:33:48,640
to closely inspect any areas of concern

910
00:33:52,950 --> 00:33:51,200
and determine whether it's safe to land

911
00:33:55,110 --> 00:33:52,960
with the damage or whether we need to

912
00:33:56,389 --> 00:33:55,120
send the crew out to to repair it via

913
00:33:58,470 --> 00:33:56,399

eva

914
00:33:59,669 --> 00:33:58,480
flight days seven and nine will each

915
00:34:01,190 --> 00:33:59,679
feature

916
00:34:04,070 --> 00:34:01,200
a few hours of off-duty time in the

917
00:34:05,990 --> 00:34:04,080
afternoon and flight day eight will do a

918
00:34:08,069 --> 00:34:06,000
resize of one of the spacesuits on the

919
00:34:09,829 --> 00:34:08,079
space station and then bring it back in

920
00:34:11,990 --> 00:34:09,839
the shuttle to earth we'll rotate one of

921
00:34:14,389 --> 00:34:12,000
our spacesuits from the space shuttle up

922
00:34:17,190 --> 00:34:14,399
to stay on the space station

923
00:34:19,430 --> 00:34:17,200
flight day nine is our last full day of

924
00:34:20,790 --> 00:34:19,440
mplm cargo transfer the important thing

925
00:34:23,109 --> 00:34:20,800
on that day will be to make sure we've

926
00:34:25,190 --> 00:34:23,119
gotten everything off the mplm to make

927
00:34:27,589 --> 00:34:25,200
sure that it's properly loaded with the

928
00:34:29,669 --> 00:34:27,599
return cargo we have literally tons of

929
00:34:31,030 --> 00:34:29,679
tons of cargo coming back

930
00:34:33,829 --> 00:34:31,040
it's important to make sure that we get

931
00:34:35,190 --> 00:34:33,839
the right cg and loading for that mplm

932
00:34:36,470 --> 00:34:35,200
on the on the way home and we're

933
00:34:38,069 --> 00:34:36,480
bringing back things

934
00:34:40,230 --> 00:34:38,079
such as trash

935
00:34:43,270 --> 00:34:40,240
obsolete parts equipment that can come

936
00:34:45,750 --> 00:34:43,280
back and be refurbished and reflown

937
00:34:47,510 --> 00:34:45,760
as well as science samples so uh just to

938
00:34:50,710 --> 00:34:47,520

run down some of the numbers there on on

939
00:34:54,470 --> 00:34:50,720
cargo return we expect the mplm to weigh

940
00:34:58,069 --> 00:34:54,480
uh 21 500 pounds for the trip home and

941
00:35:00,390 --> 00:34:58,079
our total return complement is 6 300

942
00:35:02,790 --> 00:35:00,400
pounds and we go and roll the video and

943
00:35:05,030 --> 00:35:02,800
i'll show you the process of

944
00:35:07,750 --> 00:35:05,040
unbirthing the mplm uh towards the

945
00:35:09,829 --> 00:35:07,760
middle of flight day nine

946
00:35:12,390 --> 00:35:09,839
of course we'll get the hatches closed

947
00:35:14,150 --> 00:35:12,400
again doug and sandy will be back in the

948
00:35:15,670 --> 00:35:14,160
uh the cupola

949
00:35:22,069 --> 00:35:15,680
they'll drive the bolts to release the

950
00:35:32,069 --> 00:35:23,829
and they'll carefully maneuver it into

951
00:35:35,349 --> 00:35:34,069
and this uh

952
00:35:40,390 --> 00:35:35,359
this will actually take place on flight

953
00:35:45,190 --> 00:35:42,630
also on flight day 10 in addition to

954
00:35:46,550 --> 00:35:45,200
restowing the mplm we'll be transferring

955
00:35:47,990 --> 00:35:46,560
our science samples we're bringing back

956
00:35:49,910 --> 00:35:48,000
a lot of biological

957
00:35:51,430 --> 00:35:49,920
samples that need to be kept

958
00:35:53,589 --> 00:35:51,440
kept cold so those will be coming out of

959
00:35:55,109 --> 00:35:53,599
the station freezers and put into

960
00:35:57,030 --> 00:35:55,119
freezers on the uh the space shuttle

961
00:35:58,950 --> 00:35:57,040
flight deck and again flight day 10 is a

962
00:36:00,950 --> 00:35:58,960
real busy day just to make sure that all

963
00:36:02,310 --> 00:36:00,960

the transfers are done uh done correctly

964
00:36:04,550 --> 00:36:02,320
we got everything on the right side of

965
00:36:06,069 --> 00:36:04,560
the hatches and uh and then the crew

966
00:36:07,670 --> 00:36:06,079
crib will say farewell and close the

967
00:36:09,750 --> 00:36:07,680
hatches that evening and with the

968
00:36:12,230 --> 00:36:09,760
departure of atlantis the focus on the

969
00:36:15,430 --> 00:36:12,240
station will switch from assembly ops to

970
00:36:16,710 --> 00:36:15,440
uh to utilization and uh

971
00:36:18,150 --> 00:36:16,720
again the type of science that we'll be

972
00:36:20,870 --> 00:36:18,160
doing on the space station has a lot of

973
00:36:21,990 --> 00:36:20,880
applications to to to folks on earth i

974
00:36:24,630 --> 00:36:22,000
mentioned uh

975
00:36:26,470 --> 00:36:24,640
the ultrasound and we're also

976
00:36:28,630 --> 00:36:26,480
examining the effects of of

977
00:36:30,870 --> 00:36:28,640
weightlessness on uh the immune systems

978
00:36:32,550 --> 00:36:30,880
of the astronauts we've noticed how uh

979
00:36:34,150 --> 00:36:32,560
their immune systems are compromised by

980
00:36:36,150 --> 00:36:34,160
space flight we don't understand the

981
00:36:37,990 --> 00:36:36,160
mechanism it's a very important area of

982
00:36:40,870 --> 00:36:38,000
research that will continue on the space

983
00:36:42,870 --> 00:36:40,880
station with obvious applications uh for

984
00:36:44,950 --> 00:36:42,880
people on earth and again uh with our

985
00:36:46,870 --> 00:36:44,960
advanced uh life support system we're

986
00:36:49,109 --> 00:36:46,880
working towards closing the loop to

987
00:36:50,950 --> 00:36:49,119
reuse all the water on space station and

988
00:36:52,950 --> 00:36:50,960

not waste anything with our advanced

989
00:36:55,190 --> 00:36:52,960
recycle filter tank assembly we're

990
00:36:57,349 --> 00:36:55,200
getting very close to being able to to

991
00:36:59,990 --> 00:36:57,359
recycle urine indefinitely with very

992
00:37:02,630 --> 00:37:00,000
minimal resupplies and we're already at

993
00:37:04,150 --> 00:37:02,640
the point now we've got uh

994
00:37:05,910 --> 00:37:04,160
carbon dioxide scrubbers that are

995
00:37:08,310 --> 00:37:05,920
operational on station

996
00:37:10,390 --> 00:37:08,320
that that require no no throwaway parts

997
00:37:13,030 --> 00:37:10,400
they're completely regenerable and that

998
00:37:14,870 --> 00:37:13,040
means uh for at least for carbon dioxide

999
00:37:16,230 --> 00:37:14,880
and for for water we are getting very

1000
00:37:17,990 --> 00:37:16,240
close to the point where we can leave

1001
00:37:21,670 --> 00:37:18,000
low earth orbit and go for an extended

1002
00:37:23,430 --> 00:37:21,680
time into interplanetary travel

1003
00:37:24,790 --> 00:37:23,440
while recycling those critical life

1004
00:37:26,870 --> 00:37:24,800
support uh

1005
00:37:29,750 --> 00:37:26,880
functions and so i fully expect in the

1006
00:37:31,589 --> 00:37:29,760
next 30 to 50 years when spaceships are

1007
00:37:33,589 --> 00:37:31,599
leaving low earth orbit they'll be using

1008
00:37:35,270 --> 00:37:33,599
the systems that we've demonstrated on

1009
00:37:36,470 --> 00:37:35,280
the space station so that's that's the

1010
00:37:38,950 --> 00:37:36,480
legacy of the space shuttle and we're

1011
00:37:40,870 --> 00:37:38,960
really excited uh to end this mission on

1012
00:37:43,190 --> 00:37:40,880
a high note so i'll hand it back to

1013
00:37:44,470 --> 00:37:43,200

quatzi for the remainder of the mission

1014
00:37:46,710 --> 00:37:44,480
thank you chris

1015
00:37:48,950 --> 00:37:46,720
as you can tell from this very thorough

1016
00:37:51,270 --> 00:37:48,960
uh description that we do have a lot of

1017
00:37:53,030 --> 00:37:51,280
work to do during the docked phase but

1018
00:37:55,430 --> 00:37:53,040
at the end of flight day 10

1019
00:37:56,790 --> 00:37:55,440
the crew of atlantis will be

1020
00:37:58,790 --> 00:37:56,800
buttoning up the spacecraft and

1021
00:38:01,190 --> 00:37:58,800
preparing for undocking the next day

1022
00:38:02,950 --> 00:38:01,200
that preparation will include installing

1023
00:38:06,150 --> 00:38:02,960
the centerline camera

1024
00:38:07,829 --> 00:38:06,160
into the orbiter docking system as well

1025
00:38:09,829 --> 00:38:07,839
as maneuvering the

1026
00:38:11,190 --> 00:38:09,839
orbiter boom sensor system into its

1027
00:38:13,109 --> 00:38:11,200
undock position

1028
00:38:15,750 --> 00:38:13,119
and doing the rendezvous tools checkout

1029
00:38:18,470 --> 00:38:15,760
that will be required for the next day's

1030
00:38:20,950 --> 00:38:18,480
undocking and fly around very early on

1031
00:38:23,510 --> 00:38:20,960
flight day 11 atlantis will release

1032
00:38:26,150 --> 00:38:23,520
hooks and undock from the international

1033
00:38:28,790 --> 00:38:26,160
space station for the very last time

1034
00:38:30,550 --> 00:38:28,800
she'll perform a a modified fly around

1035
00:38:31,670 --> 00:38:30,560
which we're actually very excited about

1036
00:38:35,670 --> 00:38:31,680
this

1037
00:38:38,870 --> 00:38:35,680
undock from the international space

1038
00:38:41,190 --> 00:38:38,880

station and and fly around the space

1039
00:38:43,270 --> 00:38:41,200
station taking photographs

1040
00:38:44,710 --> 00:38:43,280
in the undocking orientation but what's

1041
00:38:47,589 --> 00:38:44,720
going to happen this time

1042
00:38:49,349 --> 00:38:47,599
is uh atlantis will hold at about 600

1043
00:38:52,069 --> 00:38:49,359
feet away from the space station while

1044
00:38:54,150 --> 00:38:52,079
the space station performs a 90 degree

1045
00:38:56,630 --> 00:38:54,160
yaw maneuver and we have a video that of

1046
00:38:58,870 --> 00:38:56,640
what that looks like that we'll show you

1047
00:39:01,430 --> 00:38:58,880
what this does for us is this allows us

1048
00:39:03,349 --> 00:39:01,440
to present a side of the space station

1049
00:39:04,390 --> 00:39:03,359
that the shuttle does not normally get

1050
00:39:06,870 --> 00:39:04,400
to see

1051
00:39:09,190 --> 00:39:06,880
on undock and fly around so the crew can

1052
00:39:11,670 --> 00:39:09,200
take high resolution engineering quality

1053
00:39:13,750 --> 00:39:11,680
photos of sections of the spacecraft

1054
00:39:16,950 --> 00:39:13,760
that we have not seen before

1055
00:39:19,190 --> 00:39:16,960
on fly around this will enable us to

1056
00:39:20,790 --> 00:39:19,200
evaluate other areas of the space

1057
00:39:22,470 --> 00:39:20,800
station for

1058
00:39:23,670 --> 00:39:22,480
micrometeoroid and orbital debris

1059
00:39:24,790 --> 00:39:23,680
impacts

1060
00:39:26,870 --> 00:39:24,800
as well as

1061
00:39:28,710 --> 00:39:26,880
assess the overall health of those parts

1062
00:39:31,270 --> 00:39:28,720
of the spacecraft

1063
00:39:33,910 --> 00:39:31,280

after that half lap fly around atlantis

1064
00:39:35,910 --> 00:39:33,920
will set and go on her merry way while

1065
00:39:37,349 --> 00:39:35,920
the iss maneuvers back to its normal

1066
00:39:40,230 --> 00:39:37,359
attitude

1067
00:39:41,670 --> 00:39:40,240
we'll then prepare for the final tps

1068
00:39:43,430 --> 00:39:41,680
inspection

1069
00:39:46,230 --> 00:39:43,440
of the mission and that's what we call

1070
00:39:48,550 --> 00:39:46,240
our late inspection in this case the

1071
00:39:51,589 --> 00:39:48,560
mechanics of the late inspection are

1072
00:39:53,829 --> 00:39:51,599
identical to that of the the the flight

1073
00:39:55,829 --> 00:39:53,839
day 2 inspection that you saw

1074
00:39:58,310 --> 00:39:55,839
earlier but in this instance we're

1075
00:40:00,790 --> 00:39:58,320
looking for signs of micrometeoroid and

1076
00:40:02,630 --> 00:40:00,800
orbital debris damage and we do have an

1077
00:40:04,710 --> 00:40:02,640
animation of the late inspection that

1078
00:40:06,950 --> 00:40:04,720
we'll show you again much of it should

1079
00:40:09,910 --> 00:40:06,960
look very familiar in that we're going

1080
00:40:11,030 --> 00:40:09,920
to use the orbital boom sensor system to

1081
00:40:14,390 --> 00:40:11,040
start with

1082
00:40:15,430 --> 00:40:14,400
a high-resolution scan of the starboard

1083
00:40:17,190 --> 00:40:15,440
wing

1084
00:40:19,030 --> 00:40:17,200
looking for any damage that might have

1085
00:40:21,190 --> 00:40:19,040
occurred during the docked phases while

1086
00:40:23,030 --> 00:40:21,200
we were doing all of our logistics and

1087
00:40:24,710 --> 00:40:23,040
resupply and even during the the

1088
00:40:28,069 --> 00:40:24,720

spacewalk

1089
00:40:29,030 --> 00:40:28,079
this helps give us a final sense of

1090
00:40:30,950 --> 00:40:29,040
comfort

1091
00:40:33,270 --> 00:40:30,960
and assurance that

1092
00:40:35,109 --> 00:40:33,280
atlantis tps or thermal protection

1093
00:40:37,430 --> 00:40:35,119
system will be in good shape

1094
00:40:39,030 --> 00:40:37,440
when we prepare for her final deorbit

1095
00:40:41,030 --> 00:40:39,040
and landing

1096
00:40:43,750 --> 00:40:41,040
we'll inspect the starboard wing first

1097
00:40:45,030 --> 00:40:43,760
then the nose cap and then finally the

1098
00:40:46,069 --> 00:40:45,040
the port wing

1099
00:40:48,069 --> 00:40:46,079
as well as

1100
00:40:51,589 --> 00:40:48,079
selected areas around the payload bay

1101
00:40:53,910 --> 00:40:51,599
doors and the the umbilical interfaces

1102
00:40:55,030 --> 00:40:53,920
again looking for any

1103
00:40:56,470 --> 00:40:55,040
last minute

1104
00:40:59,829 --> 00:40:56,480
issues that we might need to address

1105
00:41:01,990 --> 00:40:59,839
before we prepare for uh for for landing

1106
00:41:03,670 --> 00:41:02,000
very next day on flight day 12 the big

1107
00:41:06,470 --> 00:41:03,680
item that we've got there is the deploy

1108
00:41:08,069 --> 00:41:06,480
of the picosat solar cell satellite

1109
00:41:10,069 --> 00:41:08,079
this is a very small

1110
00:41:11,670 --> 00:41:10,079
very small satellite we have a photo of

1111
00:41:13,030 --> 00:41:11,680
it for you

1112
00:41:14,790 --> 00:41:13,040
and essentially it

1113
00:41:17,030 --> 00:41:14,800

it's

1114
00:41:19,030 --> 00:41:17,040
a dod payload

1115
00:41:21,589 --> 00:41:19,040
we've done these before essentially it's

1116
00:41:24,230 --> 00:41:21,599
got a series of solar cells

1117
00:41:25,990 --> 00:41:24,240
that power some antennas and some some

1118
00:41:27,670 --> 00:41:26,000
other maneuvering systems on that

1119
00:41:29,510 --> 00:41:27,680
satellite

1120
00:41:33,589 --> 00:41:29,520
we also have an animation of the

1121
00:41:36,150 --> 00:41:33,599
deployment uh we'll maneuver the shuttle

1122
00:41:37,349 --> 00:41:36,160
its deploy altitude and its deploy

1123
00:41:39,190 --> 00:41:37,359
attitude

1124
00:41:40,390 --> 00:41:39,200
the animation which we'll show you here

1125
00:41:42,870 --> 00:41:40,400
very briefly

1126
00:41:44,150 --> 00:41:42,880
shows uh the canister that i illustrated

1127
00:41:45,910 --> 00:41:44,160
to you earlier

1128
00:41:48,069 --> 00:41:45,920
uh the satellite will be released from

1129
00:41:51,190 --> 00:41:48,079
the canister mechanically

1130
00:41:53,670 --> 00:41:51,200
float just above the obss and then move

1131
00:41:55,109 --> 00:41:53,680
away following the deployment of that

1132
00:41:57,030 --> 00:41:55,119
satellite the

1133
00:42:00,150 --> 00:41:57,040
shuttle atlantis will execute a small

1134
00:42:01,910 --> 00:42:00,160
maneuvering burn to maneuver

1135
00:42:03,589 --> 00:42:01,920
the shuttle out of the way so that we

1136
00:42:04,870 --> 00:42:03,599
don't re-contact that satellite on the

1137
00:42:07,589 --> 00:42:04,880
following orbit

1138
00:42:09,190 --> 00:42:07,599

and then we'll prepare for uh our uh

1139
00:42:11,430 --> 00:42:09,200
standard

1140
00:42:13,109 --> 00:42:11,440
landing minus one day activities which

1141
00:42:15,510 --> 00:42:13,119
include a checkout of the flight control

1142
00:42:18,150 --> 00:42:15,520
system uh check out of all of the uh

1143
00:42:20,550 --> 00:42:18,160
reaction control system jets uh we'll

1144
00:42:23,589 --> 00:42:20,560
stow the ku band antenna and basically

1145
00:42:25,349 --> 00:42:23,599
prepare uh atlantis systems for uh

1146
00:42:27,349 --> 00:42:25,359
deorbit landing which will occur on

1147
00:42:29,190 --> 00:42:27,359
flight day 13.

1148
00:42:31,990 --> 00:42:29,200
that'll be our final

1149
00:42:33,510 --> 00:42:32,000
deorbit and landing hopefully to kennedy

1150
00:42:35,270 --> 00:42:33,520
space center if the weather holds out

1151
00:42:37,109 --> 00:42:35,280
but of course as always

1152
00:42:39,829 --> 00:42:37,119
we have other landing opportunities

1153
00:42:41,750 --> 00:42:39,839
which entry flight director tony soccer

1154
00:42:42,829 --> 00:42:41,760
will will talk to you about in in the

1155
00:42:45,829 --> 00:42:42,839
coming

1156
00:42:47,510 --> 00:42:45,839
days so in conclusion uh we're expecting

1157
00:42:49,430 --> 00:42:47,520
a very busy mission uh we think it's

1158
00:42:51,270 --> 00:42:49,440
going to be an exciting mission

1159
00:42:53,750 --> 00:42:51,280
uh there are

1160
00:42:55,430 --> 00:42:53,760
obviously a great sense of mixed

1161
00:42:57,510 --> 00:42:55,440
feelings surrounding this final mission

1162
00:42:59,910 --> 00:42:57,520
of the space shuttle program

1163
00:43:00,550 --> 00:42:59,920

i know i i personally feel very humbled

1164
00:43:06,069 --> 00:43:00,560
and

1165
00:43:08,150 --> 00:43:06,079
mission in particular

1166
00:43:10,309 --> 00:43:08,160
i was in fourth grade when uh space

1167
00:43:12,630 --> 00:43:10,319
shuttle columbia launched on its very

1168
00:43:14,710 --> 00:43:12,640
first mission so it's actually it's

1169
00:43:16,550 --> 00:43:14,720
actually quite an honor to be the lead

1170
00:43:18,150 --> 00:43:16,560
flight director on the last mission of

1171
00:43:19,910 --> 00:43:18,160
the space shuttle program

1172
00:43:21,270 --> 00:43:19,920
you know to me personally the the

1173
00:43:22,550 --> 00:43:21,280
shuttle was one of the things that

1174
00:43:25,030 --> 00:43:22,560
inspired me

1175
00:43:27,270 --> 00:43:25,040
to want to focus on math and science

1176
00:43:29,030 --> 00:43:27,280
while i was in school i actually decided

1177
00:43:30,390 --> 00:43:29,040
when i was in fourth grade after

1178
00:43:31,670 --> 00:43:30,400
watching the launch of space shuttle

1179
00:43:33,750 --> 00:43:31,680
columbia that

1180
00:43:35,510 --> 00:43:33,760
i wanted to be an engineer

1181
00:43:37,270 --> 00:43:35,520
and in particular that

1182
00:43:39,510 --> 00:43:37,280
i wanted to go to

1183
00:43:40,870 --> 00:43:39,520
to mit to study engineering of course

1184
00:43:42,870 --> 00:43:40,880
many of the managers around here would

1185
00:43:46,630 --> 00:43:42,880
tell you that i didn't have enough sense

1186
00:43:51,190 --> 00:43:49,109
i i think i did okay

1187
00:43:53,510 --> 00:43:51,200
although although mit isn't cool enough

1188
00:43:55,109 --> 00:43:53,520

to get a space shuttle simulator

1189
00:43:57,829 --> 00:43:55,119
alma mater does do the analysis that

1190
00:44:00,150 --> 00:43:57,839
allows the shuttle to maneuver in space

1191
00:44:01,349 --> 00:44:00,160
so for for me personally i consider this

1192
00:44:05,190 --> 00:44:01,359
a great honor

1193
00:44:07,190 --> 00:44:05,200
the flight controllers that have been

1194
00:44:09,190 --> 00:44:07,200
detailed to me on my team

1195
00:44:10,710 --> 00:44:09,200
we have people of diverse backgrounds

1196
00:44:13,030 --> 00:44:10,720
and and

1197
00:44:14,630 --> 00:44:13,040
and diverse skills and capabilities

1198
00:44:16,230 --> 00:44:14,640
they're some of the finest engineers in

1199
00:44:18,309 --> 00:44:16,240
the country some of the finest engineers

1200
00:44:19,910 --> 00:44:18,319
that i've worked with

1201
00:44:21,990 --> 00:44:19,920
and i can't think of too many more

1202
00:44:23,750 --> 00:44:22,000
places i would rather be than in the

1203
00:44:25,670 --> 00:44:23,760
space shuttle flight control room

1204
00:44:27,670 --> 00:44:25,680
leading those troops into

1205
00:44:28,550 --> 00:44:27,680
a fierce battle with gravity one last

1206
00:44:31,430 --> 00:44:28,560
time

1207
00:44:33,430 --> 00:44:31,440
and so we very much appreciate what the

1208
00:44:35,510 --> 00:44:33,440
shuttle program has done for us the

1209
00:44:36,790 --> 00:44:35,520
national capabilities that that we've

1210
00:44:38,870 --> 00:44:36,800
gained through it the knowledge that

1211
00:44:41,510 --> 00:44:38,880
we've gained through it and are looking

1212
00:44:44,390 --> 00:44:41,520
forward to to transitioning to

1213
00:44:46,470 --> 00:44:44,400

the next things that we'll focus on i do

1214
00:44:49,190 --> 00:44:46,480
not at all in any way shape or form view

1215
00:44:51,670 --> 00:44:49,200
the end of sts-135 and the end of the

1216
00:44:52,790 --> 00:44:51,680
program is the end of human space flight

1217
00:44:54,150 --> 00:44:52,800
i think that

1218
00:44:56,550 --> 00:44:54,160
that's you know would be rather

1219
00:44:58,309 --> 00:44:56,560
short-sighted of me reflecting on the

1220
00:44:59,589 --> 00:44:58,319
incredible spacecraft that we've been

1221
00:45:01,990 --> 00:44:59,599
able to build

1222
00:45:04,230 --> 00:45:02,000
in the international space station

1223
00:45:05,910 --> 00:45:04,240
and we have the capabilities to uh to go

1224
00:45:07,430 --> 00:45:05,920
further with uh different national

1225
00:45:09,990 --> 00:45:07,440
visions

1226
00:45:13,349 --> 00:45:10,000
as mr shannon alluded to earlier uh

1227
00:45:15,670 --> 00:45:13,359
there is limited money and so in an era

1228
00:45:18,470 --> 00:45:15,680
where you have limited money

1229
00:45:20,470 --> 00:45:18,480
any any enterprise any portfolio of

1230
00:45:22,390 --> 00:45:20,480
programs that claims to be advancing the

1231
00:45:24,150 --> 00:45:22,400
cause of human space flight

1232
00:45:25,829 --> 00:45:24,160
is going to be filled with endings and

1233
00:45:29,190 --> 00:45:25,839
filled with beginnings

1234
00:45:31,670 --> 00:45:29,200
and so the challenge really is for us to

1235
00:45:33,910 --> 00:45:31,680
end in a manner that is respectful of

1236
00:45:35,990 --> 00:45:33,920
the dedicated professionals that that

1237
00:45:38,950 --> 00:45:36,000
have contributed to the cause

1238
00:45:41,069 --> 00:45:38,960

and to begin in ways that set us up for

1239
00:45:44,309 --> 00:45:41,079
uh for long-term success so

1240
00:45:47,349 --> 00:45:44,319
sts-135 is is in my view

1241
00:45:49,109 --> 00:45:47,359
an important first step in an important

1242
00:45:50,069 --> 00:45:49,119
transition in our national vision for

1243
00:45:52,069 --> 00:45:50,079
space

1244
00:45:53,990 --> 00:45:52,079
and so i'm privileged to be a part of it

1245
00:45:55,829 --> 00:45:54,000
uh mr edelman and i are

1246
00:45:58,150 --> 00:45:55,839
are very much looking forward to uh

1247
00:46:00,390 --> 00:45:58,160
getting effort here in a week or so

1248
00:46:01,990 --> 00:46:00,400
and at this point i'll turn it back over

1249
00:46:03,990 --> 00:46:02,000
to rob

1250
00:46:06,390 --> 00:46:04,000
thanks squatzy thanks chris we'll take

1251
00:46:08,309 --> 00:46:06,400
questions uh here in houston uh we'll

1252
00:46:09,430 --> 00:46:08,319
start over on this side just sweep

1253
00:46:11,829 --> 00:46:09,440
across as

1254
00:46:13,030 --> 00:46:11,839
is customary and um then we'll go to the

1255
00:46:15,510 --> 00:46:13,040
other centers start off with bill

1256
00:46:17,589 --> 00:46:15,520
harwood with cbs with two quick ones i

1257
00:46:20,390 --> 00:46:17,599
think uh both for well maybe one for

1258
00:46:22,069 --> 00:46:20,400
question one for chris uh first is is

1259
00:46:23,510 --> 00:46:22,079
the chance of an extra day a long shot

1260
00:46:25,030 --> 00:46:23,520
for this mission or is that something if

1261
00:46:26,550 --> 00:46:25,040
you get off on time you think you've got

1262
00:46:27,670 --> 00:46:26,560
the margin do

1263
00:46:28,550 --> 00:46:27,680

and for

1264
00:46:29,990 --> 00:46:28,560
um

1265
00:46:31,750 --> 00:46:30,000
you know i think the media is focused on

1266
00:46:33,270 --> 00:46:31,760
ksc with people losing jobs here because

1267
00:46:34,790 --> 00:46:33,280
the numbers are bigger

1268
00:46:36,790 --> 00:46:34,800
but obviously the space shuttle mission

1269
00:46:39,109 --> 00:46:36,800
control room this is it and can you give

1270
00:46:40,630 --> 00:46:39,119
us a sense of what happens to the team

1271
00:46:43,109 --> 00:46:40,640
that's been supporting shuttle from a

1272
00:46:44,630 --> 00:46:43,119
mission control standpoint and

1273
00:46:46,710 --> 00:46:44,640
and how many of those can transition to

1274
00:46:48,390 --> 00:46:46,720
station versus just

1275
00:46:50,630 --> 00:46:48,400
going to have to walk out the door

1276
00:46:52,390 --> 00:46:50,640
okay those are those are both excellent

1277
00:46:54,309 --> 00:46:52,400
questions i can address both of them

1278
00:46:56,630 --> 00:46:54,319
first a question about the the extra day

1279
00:46:59,430 --> 00:46:56,640
the the nominal mission duration for

1280
00:47:00,950 --> 00:46:59,440
sts-135 is 12 days

1281
00:47:03,190 --> 00:47:00,960
and that's not including the the

1282
00:47:06,309 --> 00:47:03,200
contingency days that we keep in the

1283
00:47:09,589 --> 00:47:06,319
bank as a reserve uh to address weather

1284
00:47:12,790 --> 00:47:09,599
issues uh or or other systems issues

1285
00:47:15,430 --> 00:47:12,800
now we are flying with full uh cryogenic

1286
00:47:17,829 --> 00:47:15,440
tanks our cryogenic oxygen and

1287
00:47:20,309 --> 00:47:17,839
hydrogen tanks are used to generate

1288
00:47:22,390 --> 00:47:20,319

electrical power which is the limiting

1289
00:47:23,670 --> 00:47:22,400
consumable that drives how long we can

1290
00:47:25,829 --> 00:47:23,680
stay on orbit

1291
00:47:28,390 --> 00:47:25,839
based on our analysis and based on the

1292
00:47:29,910 --> 00:47:28,400
power requirements for this mission uh

1293
00:47:31,430 --> 00:47:29,920
we are

1294
00:47:35,109 --> 00:47:31,440
approximately

1295
00:47:38,309 --> 00:47:35,119
80 give or take uh kilowatt hours uh

1296
00:47:41,589 --> 00:47:38,319
away from having sufficient margin to

1297
00:47:43,910 --> 00:47:41,599
extend from 12 days to 13 days

1298
00:47:47,030 --> 00:47:43,920
now we've uh we've assessed some options

1299
00:47:49,109 --> 00:47:47,040
for uh for making up that that deficit

1300
00:47:51,430 --> 00:47:49,119
one option that we've discussed with the

1301
00:47:53,910 --> 00:47:51,440
iss program and that we've agreed to

1302
00:47:55,910 --> 00:47:53,920
is that if we do launch on time

1303
00:47:58,230 --> 00:47:55,920
we will uh not power

1304
00:47:59,829 --> 00:47:58,240
the heaters that are used to keep the

1305
00:48:02,309 --> 00:47:59,839
mplm warm

1306
00:48:04,390 --> 00:48:02,319
in the payload bay we won't power them

1307
00:48:06,230 --> 00:48:04,400
between flight days one and flight day

1308
00:48:08,230 --> 00:48:06,240
four where we install the mplm and we

1309
00:48:11,829 --> 00:48:08,240
won't power them power them after we

1310
00:48:13,990 --> 00:48:11,839
undock the unberthy the mplm uh and uh

1311
00:48:16,150 --> 00:48:14,000
and bring it home we've done analysis

1312
00:48:17,670 --> 00:48:16,160
which suggests that uh the temperatures

1313
00:48:19,030 --> 00:48:17,680

can be maintained within acceptable

1314
00:48:20,950 --> 00:48:19,040
limits without those heaters those

1315
00:48:23,910 --> 00:48:20,960
heaters really uh provided additional

1316
00:48:25,270 --> 00:48:23,920
capability and redundancy so by by not

1317
00:48:27,750 --> 00:48:25,280
powering those heaters we're going to

1318
00:48:30,150 --> 00:48:27,760
save most of the power that we need to

1319
00:48:32,309 --> 00:48:30,160
save in order to make up that extra day

1320
00:48:34,790 --> 00:48:32,319
the the remaining deficit which uh is to

1321
00:48:38,390 --> 00:48:34,800
the tune of uh right around 25 kilowatt

1322
00:48:40,790 --> 00:48:38,400
hours uh we think we can make that up uh

1323
00:48:41,829 --> 00:48:40,800
with um essentially what we call a cryo

1324
00:48:44,470 --> 00:48:41,839
overload

1325
00:48:46,470 --> 00:48:44,480
when we're loading uh the the cryogenics

1326
00:48:49,109 --> 00:48:46,480
the the oxygen and hydrogen and into

1327
00:48:51,270 --> 00:48:49,119
atlantis just prior to launch

1328
00:48:52,470 --> 00:48:51,280
typically when we top it off and and

1329
00:48:54,870 --> 00:48:52,480
fill it up

1330
00:48:56,470 --> 00:48:54,880
there's just that little bit extra that

1331
00:48:59,270 --> 00:48:56,480
we're able to get in the tanks above and

1332
00:49:01,349 --> 00:48:59,280
beyond the spec volume of the tanks we

1333
00:49:03,990 --> 00:49:01,359
call that sort of our cryo overload and

1334
00:49:05,750 --> 00:49:04,000
historically we've seen a consistent

1335
00:49:08,230 --> 00:49:05,760
trend of how much

1336
00:49:11,270 --> 00:49:08,240
how much additional poundage if you will

1337
00:49:14,470 --> 00:49:11,280
of cryogenic oxygen hydrogen we get if

1338
00:49:16,309 --> 00:49:14,480

we get what we have seen typically

1339
00:49:17,990 --> 00:49:16,319
our analysis says that that will make up

1340
00:49:20,790 --> 00:49:18,000
the remaining deficit so a combination

1341
00:49:22,230 --> 00:49:20,800
of cryo overload and not powering the

1342
00:49:23,829 --> 00:49:22,240
mplm heaters

1343
00:49:26,710 --> 00:49:23,839
we think that's going to get us there if

1344
00:49:29,109 --> 00:49:26,720
we launch on time uh if we don't get the

1345
00:49:30,630 --> 00:49:29,119
the cryo overload that we expect we

1346
00:49:33,109 --> 00:49:30,640
might be able to make up that deficit

1347
00:49:35,349 --> 00:49:33,119
with some very modest uh modest

1348
00:49:37,109 --> 00:49:35,359
additional power downs again nothing uh

1349
00:49:38,630 --> 00:49:37,119
that's critical that we would need uh

1350
00:49:40,950 --> 00:49:38,640
during our travel to and from the space

1351
00:49:42,790 --> 00:49:40,960
station but uh just you know turning

1352
00:49:44,950 --> 00:49:42,800
down the lights when we don't need them

1353
00:49:46,950 --> 00:49:44,960
that sort of thing the the typical type

1354
00:49:48,710 --> 00:49:46,960
of power conserving measures you would

1355
00:49:50,309 --> 00:49:48,720
use in your own home so we think we're

1356
00:49:53,030 --> 00:49:50,319
actually very close to getting it if we

1357
00:49:55,750 --> 00:49:53,040
get off on time now what's the what's

1358
00:49:57,589 --> 00:49:55,760
magic about about getting off on time

1359
00:50:00,870 --> 00:49:57,599
is uh with these cryogenics of course

1360
00:50:03,430 --> 00:50:00,880
they are super super cooled uh fluids

1361
00:50:05,670 --> 00:50:03,440
and even when the uh the shuttle's fuel

1362
00:50:07,750 --> 00:50:05,680
cells are not powered uh these fluids

1363
00:50:09,910 --> 00:50:07,760

don't stay super cooled for long and and

1364
00:50:12,630 --> 00:50:09,920
there's a certain amount that boils off

1365
00:50:14,790 --> 00:50:12,640
and escapes if you will and we know how

1366
00:50:16,230 --> 00:50:14,800
that process works over time and so if

1367
00:50:17,829 --> 00:50:16,240
we launch late

1368
00:50:20,309 --> 00:50:17,839
the amount of cryogenic oxygen and

1369
00:50:22,549 --> 00:50:20,319
hydrogen that's in our tanks say a day

1370
00:50:24,630 --> 00:50:22,559
late or two days late is

1371
00:50:26,870 --> 00:50:24,640
measurably less than it was on the very

1372
00:50:28,549 --> 00:50:26,880
first day that we topped off so a

1373
00:50:30,470 --> 00:50:28,559
critical enabler to us getting the extra

1374
00:50:31,750 --> 00:50:30,480
day is going to be launching on time on

1375
00:50:33,670 --> 00:50:31,760
july 8th

1376
00:50:35,109 --> 00:50:33,680
but we think we'll we'll have that we

1377
00:50:38,069 --> 00:50:35,119
think we'll probably have that in the

1378
00:50:39,109 --> 00:50:38,079
bank and what we'll do to assess that is

1379
00:50:40,870 --> 00:50:39,119
we're not going to commit to the extra

1380
00:50:43,349 --> 00:50:40,880
day as soon as we launch on time we're

1381
00:50:44,309 --> 00:50:43,359
going to get off on time hopefully

1382
00:50:46,150 --> 00:50:44,319
we'll

1383
00:50:48,230 --> 00:50:46,160
choose not to power the mplm heaters as

1384
00:50:49,910 --> 00:50:48,240
i described for you and then we'll watch

1385
00:50:51,510 --> 00:50:49,920
the performance of the electrical system

1386
00:50:52,630 --> 00:50:51,520
on the shuttle for about a good four

1387
00:50:55,670 --> 00:50:52,640
days

1388
00:50:57,270 --> 00:50:55,680

just to observe uh how our margins are

1389
00:50:59,430 --> 00:50:57,280
increasing we have very good insight

1390
00:51:01,109 --> 00:50:59,440
into that and then we'll make a decision

1391
00:51:02,710 --> 00:51:01,119
uh or ask for decision from the mission

1392
00:51:05,510 --> 00:51:02,720
management team right around flight day

1393
00:51:07,190 --> 00:51:05,520
five uh if we have seen the performance

1394
00:51:09,349 --> 00:51:07,200
that we expect

1395
00:51:10,870 --> 00:51:09,359
to to add the additional day and we'll

1396
00:51:13,990 --> 00:51:10,880
put the additional day's worth of

1397
00:51:16,150 --> 00:51:14,000
content uh in the nominal timeline

1398
00:51:18,150 --> 00:51:16,160
between flight days eight and flight day

1399
00:51:19,990 --> 00:51:18,160
nine and uh the content of that

1400
00:51:21,510 --> 00:51:20,000
additional day won't be too uh won't be

1401
00:51:23,190 --> 00:51:21,520
too mysterious it'll be

1402
00:51:24,549 --> 00:51:23,200
more cargo transfer

1403
00:51:27,190 --> 00:51:24,559
it'll enable us to get down some

1404
00:51:28,549 --> 00:51:27,200
additional uh pieces of equipment that

1405
00:51:29,510 --> 00:51:28,559
we weren't expecting to be able to get

1406
00:51:31,829 --> 00:51:29,520
down

1407
00:51:33,030 --> 00:51:31,839
and and also dispose of some additional

1408
00:51:34,069 --> 00:51:33,040
trash

1409
00:51:35,670 --> 00:51:34,079
so

1410
00:51:37,589 --> 00:51:35,680
hopefully that gives you the information

1411
00:51:39,270 --> 00:51:37,599
that that you need about our plans for

1412
00:51:40,390 --> 00:51:39,280
trying to extract an additional day out

1413
00:51:41,190 --> 00:51:40,400

of the mission

1414
00:51:42,790 --> 00:51:41,200
now

1415
00:51:44,470 --> 00:51:42,800
as it pertains to your second question

1416
00:51:46,150 --> 00:51:44,480
uh about uh

1417
00:51:48,309 --> 00:51:46,160
what's going to happen to the the flight

1418
00:51:49,589 --> 00:51:48,319
control teams i i have a considerable

1419
00:51:52,790 --> 00:51:49,599
insight into

1420
00:51:55,349 --> 00:51:52,800
the disposition of members of my team

1421
00:51:57,030 --> 00:51:55,359
in addition to staying focused on making

1422
00:51:58,230 --> 00:51:57,040
sure that this mission is accomplished

1423
00:51:59,829 --> 00:51:58,240
successfully

1424
00:52:02,069 --> 00:51:59,839
and with the same

1425
00:52:05,190 --> 00:52:02,079
diligence and the same vigilance

1426
00:52:07,750 --> 00:52:05,200
that we've put into uh prior missions uh

1427
00:52:09,990 --> 00:52:07,760
my i'd say my my next greatest concern

1428
00:52:11,190 --> 00:52:10,000
in area focus has been on uh what's

1429
00:52:13,510 --> 00:52:11,200
gonna happen to

1430
00:52:15,670 --> 00:52:13,520
to uh to my teammates and uh making sure

1431
00:52:16,829 --> 00:52:15,680
that uh that they're going to be okay

1432
00:52:19,270 --> 00:52:16,839
um my

1433
00:52:22,150 --> 00:52:19,280
observation is that

1434
00:52:24,309 --> 00:52:22,160
the the management of our contractors

1435
00:52:26,069 --> 00:52:24,319
who support the flight control team has

1436
00:52:27,750 --> 00:52:26,079
spent considerable time

1437
00:52:30,390 --> 00:52:27,760
and effort to

1438
00:52:31,750 --> 00:52:30,400

to assist those individuals who don't

1439
00:52:33,589 --> 00:52:31,760
have jobs

1440
00:52:34,870 --> 00:52:33,599
after the end of shuttle to assist those

1441
00:52:38,309 --> 00:52:34,880
folks with

1442
00:52:40,230 --> 00:52:38,319
career development by offering services

1443
00:52:42,309 --> 00:52:40,240
career placement services assistance

1444
00:52:45,670 --> 00:52:42,319
with building resumes

1445
00:52:47,030 --> 00:52:45,680
and really providing as much assistance

1446
00:52:49,270 --> 00:52:47,040
and support

1447
00:52:51,670 --> 00:52:49,280
as they could the feedback i get from

1448
00:52:54,549 --> 00:52:51,680
members of my team is that they they

1449
00:52:57,430 --> 00:52:54,559
feel like they have been well helped

1450
00:52:59,510 --> 00:52:57,440
there's a mix of of stories on my flight

1451
00:53:02,309 --> 00:52:59,520
control team the people who report to me

1452
00:53:04,150 --> 00:53:02,319
directly there are some individuals who

1453
00:53:07,349 --> 00:53:04,160
uh right now have already been

1454
00:53:08,790 --> 00:53:07,359
identified as as very strong candidates

1455
00:53:11,109 --> 00:53:08,800
for certain disciplines on the space

1456
00:53:12,470 --> 00:53:11,119
station flight control team and they'll

1457
00:53:14,870 --> 00:53:12,480
have the the good fortune of

1458
00:53:16,870 --> 00:53:14,880
transitioning to those jobs

1459
00:53:19,349 --> 00:53:16,880
right after uh right after we conclude

1460
00:53:20,630 --> 00:53:19,359
the the final mission of atlantis

1461
00:53:22,630 --> 00:53:20,640
there are some members of my flight

1462
00:53:25,510 --> 00:53:22,640
control team who have

1463
00:53:28,069 --> 00:53:25,520

actually looked for and found jobs uh

1464
00:53:31,030 --> 00:53:28,079
prior to this this launch we've had some

1465
00:53:33,270 --> 00:53:31,040
change out and some turnover uh on my

1466
00:53:34,950 --> 00:53:33,280
team in the last uh six months because

1467
00:53:36,630 --> 00:53:34,960
there were some folks who

1468
00:53:38,230 --> 00:53:36,640
who actually had interviewed for jobs

1469
00:53:40,710 --> 00:53:38,240
and and they were fortunate enough to

1470
00:53:42,870 --> 00:53:40,720
get some uh and and they started before

1471
00:53:45,910 --> 00:53:42,880
the flight of this mission we even have

1472
00:53:48,150 --> 00:53:45,920
some folks on my team who who have

1473
00:53:50,630 --> 00:53:48,160
been selected and and have gotten jobs

1474
00:53:53,109 --> 00:53:50,640
uh that they will be able to start after

1475
00:53:57,190 --> 00:53:53,119
this mission so that they'll be able to

1476
00:53:57,990 --> 00:53:57,200
to carry out sts-135 and after sts-135

1477
00:54:03,349 --> 00:53:58,000
they

1478
00:54:04,470 --> 00:54:03,359
outside of nasa and outside of a space

1479
00:54:06,069 --> 00:54:04,480
industry

1480
00:54:07,670 --> 00:54:06,079
to go to and be able to start a new

1481
00:54:09,750 --> 00:54:07,680
career and then of course on the flip

1482
00:54:10,390 --> 00:54:09,760
side of the coin there are individuals

1483
00:54:12,309 --> 00:54:10,400
who

1484
00:54:13,589 --> 00:54:12,319
at this hour

1485
00:54:18,230 --> 00:54:13,599
do not have

1486
00:54:22,390 --> 00:54:18,240
uh specific uh plans or uh or or job

1487
00:54:25,829 --> 00:54:22,400
prospects uh after we'll stop on sts-135

1488
00:54:28,150 --> 00:54:25,839

so there's a mix of uh of successes uh

1489
00:54:30,230 --> 00:54:28,160
and a mix of uh of works and progress

1490
00:54:31,990 --> 00:54:30,240
with respect to the uh the disposition

1491
00:54:35,670 --> 00:54:32,000
of the the personnel who are going to be

1492
00:54:40,870 --> 00:54:37,990
tracy watson usa today can you talk

1493
00:54:43,510 --> 00:54:40,880
about how the flight day 2 inspections

1494
00:54:46,390 --> 00:54:43,520
and the docking will accommodate the

1495
00:54:47,750 --> 00:54:46,400
smaller crew what tweaks have you made

1496
00:54:49,990 --> 00:54:47,760
where have you where have you squeezed

1497
00:54:51,910 --> 00:54:50,000
out the time and the tasks that's a

1498
00:54:53,589 --> 00:54:51,920
that's a great question uh you know

1499
00:54:55,910 --> 00:54:53,599
there's a there's an expression among

1500
00:54:58,150 --> 00:54:55,920
the the management ranks that there is

1501
00:55:00,789 --> 00:54:58,160
absolutely no substitute for having

1502
00:55:03,589 --> 00:55:00,799
really smart people working for you uh

1503
00:55:06,549 --> 00:55:03,599
the uh the folks who uh who are doing

1504
00:55:09,190 --> 00:55:06,559
the planning for this mission uh we gave

1505
00:55:11,829 --> 00:55:09,200
them the challenge early on to uh to try

1506
00:55:13,990 --> 00:55:11,839
to figure out a way if possible that we

1507
00:55:16,789 --> 00:55:14,000
could get this crew to the international

1508
00:55:18,870 --> 00:55:16,799
space station uh in three days that was

1509
00:55:20,630 --> 00:55:18,880
critical because as you know atlantis is

1510
00:55:22,549 --> 00:55:20,640
not a

1511
00:55:24,710 --> 00:55:22,559
what we call a spitz capable spacecraft

1512
00:55:26,549 --> 00:55:24,720
so we we don't have the capability to

1513
00:55:28,710 --> 00:55:26,559

feed atlantis power systems from the

1514
00:55:30,950 --> 00:55:28,720
international space station so we have a

1515
00:55:33,030 --> 00:55:30,960
very limited window of time in which to

1516
00:55:35,349 --> 00:55:33,040
accomplish this mission however we're

1517
00:55:37,990 --> 00:55:35,359
also flying up uh one of the heaviest

1518
00:55:40,150 --> 00:55:38,000
and fullest mplms that we flew

1519
00:55:41,270 --> 00:55:40,160
so getting to uh to the space station on

1520
00:55:43,270 --> 00:55:41,280
flight day three was going to be a

1521
00:55:45,670 --> 00:55:43,280
critical enabler for the core

1522
00:55:46,789 --> 00:55:45,680
uh purpose for which we're flying this

1523
00:55:48,230 --> 00:55:46,799
mission

1524
00:55:49,750 --> 00:55:48,240
as you've probably heard from us in

1525
00:55:52,870 --> 00:55:49,760
times past particularly when we were

1526
00:55:55,510 --> 00:55:52,880
doing early assessments for sts-133

1527
00:55:57,270 --> 00:55:55,520
that in the post-columbia era where we

1528
00:56:00,309 --> 00:55:57,280
have all of these tps inspections that

1529
00:56:02,870 --> 00:56:00,319
we have to do between launch and docking

1530
00:56:04,390 --> 00:56:02,880
with the reduced crew complement uh we

1531
00:56:06,230 --> 00:56:04,400
we really

1532
00:56:07,990 --> 00:56:06,240
were struggling to find a way to connect

1533
00:56:10,150 --> 00:56:08,000
the dots if you will in a way that

1534
00:56:12,390 --> 00:56:10,160
respected all of our constraints for

1535
00:56:14,950 --> 00:56:12,400
scheduling of the crew day

1536
00:56:17,030 --> 00:56:14,960
uh what we were able to do was actually

1537
00:56:18,230 --> 00:56:17,040
find some efficiencies on the day of

1538
00:56:21,190 --> 00:56:18,240

launch

1539
00:56:24,069 --> 00:56:21,200
that uh are not always visible and that

1540
00:56:26,710 --> 00:56:24,079
that are are largely unknown to many uh

1541
00:56:30,230 --> 00:56:26,720
on the cruise launch day uh we typically

1542
00:56:32,549 --> 00:56:30,240
wake the crew up several hours before we

1543
00:56:34,710 --> 00:56:32,559
begin preparation for them to uh to get

1544
00:56:36,950 --> 00:56:34,720
into the shuttle and uh and actually

1545
00:56:39,589 --> 00:56:36,960
launch and then after launch we tend to

1546
00:56:41,109 --> 00:56:39,599
keep the crew up about uh for about six

1547
00:56:42,789 --> 00:56:41,119
and a half hours so

1548
00:56:44,230 --> 00:56:42,799
on these missions typically the crew

1549
00:56:45,109 --> 00:56:44,240
will go to bed about six and a half

1550
00:56:48,549 --> 00:56:45,119
hours

1551
00:56:51,109 --> 00:56:48,559
after launch and that that makes for

1552
00:56:54,230 --> 00:56:51,119
a a respectable crew day that that

1553
00:56:55,829 --> 00:56:54,240
doesn't doesn't uh overly tax them

1554
00:56:58,230 --> 00:56:55,839
well the feedback that we've gotten from

1555
00:57:01,670 --> 00:56:58,240
recent crews is that this time period

1556
00:57:04,309 --> 00:57:01,680
between wake up and uh and and uh

1557
00:57:05,829 --> 00:57:04,319
earnest preparations for launch which

1558
00:57:07,990 --> 00:57:05,839
uh in their pre-flight timeline is

1559
00:57:10,309 --> 00:57:08,000
called crew study time that most of them

1560
00:57:12,309 --> 00:57:10,319
don't really use it for crew study uh i

1561
00:57:14,710 --> 00:57:12,319
mean honestly with it with as much as we

1562
00:57:17,109 --> 00:57:14,720
rehearse these missions and uh simulate

1563
00:57:19,030 --> 00:57:17,119

them and train them uh the crews uh

1564
00:57:20,710 --> 00:57:19,040
usually on the day of launch are are

1565
00:57:22,789 --> 00:57:20,720
very well familiar with what they're

1566
00:57:24,710 --> 00:57:22,799
going to go do and so they they

1567
00:57:26,390 --> 00:57:24,720
typically have not utilized this time

1568
00:57:28,710 --> 00:57:26,400
fully

1569
00:57:32,069 --> 00:57:28,720
our planters had the the bright idea to

1570
00:57:35,109 --> 00:57:32,079
uh to to to basically wake the crew up

1571
00:57:37,510 --> 00:57:35,119
later and essentially uh dispose of this

1572
00:57:39,990 --> 00:57:37,520
this under utilized time

1573
00:57:43,670 --> 00:57:40,000
so that we could then keep the crew up

1574
00:57:46,549 --> 00:57:43,680
in space later and put them to bed

1575
00:57:47,670 --> 00:57:46,559
at about eight and a half hours by six

1576
00:57:50,549 --> 00:57:47,680
and a half

1577
00:57:51,670 --> 00:57:50,559
and so that allows us to accomplish more

1578
00:57:52,950 --> 00:57:51,680
activities

1579
00:57:56,069 --> 00:57:52,960
in space

1580
00:57:58,470 --> 00:57:56,079
while still putting the crew to bed uh

1581
00:57:59,910 --> 00:57:58,480
at the same time relative to when they

1582
00:58:01,829 --> 00:57:59,920
woke up that they normally would go to

1583
00:58:03,910 --> 00:58:01,839
bed so it's completely compliant with

1584
00:58:05,750 --> 00:58:03,920
all of our our medical requirements for

1585
00:58:08,630 --> 00:58:05,760
the length of a crew day but essentially

1586
00:58:11,510 --> 00:58:08,640
we traded some unused time on the ground

1587
00:58:13,030 --> 00:58:11,520
for some very badly needed time on orbit

1588
00:58:15,990 --> 00:58:13,040

which has allowed

1589
00:58:17,910 --> 00:58:16,000
this reduced crew size to accomplish all

1590
00:58:20,549 --> 00:58:17,920
of the critical path activities on

1591
00:58:23,430 --> 00:58:20,559
flight day one that then had a waterfall

1592
00:58:25,349 --> 00:58:23,440
effect that enabled us to uh to complete

1593
00:58:29,270 --> 00:58:25,359
all the activities we needed to complete

1594
00:58:34,549 --> 00:58:31,829
questions questions let's see let's go

1595
00:58:36,950 --> 00:58:34,559
to marcia here in the middle

1596
00:58:38,870 --> 00:58:36,960
marcia done associated press for quatsi

1597
00:58:40,230 --> 00:58:38,880
um you i was wondering how many total

1598
00:58:42,630 --> 00:58:40,240
team members do you have that you've

1599
00:58:45,589 --> 00:58:42,640
been describing and out of that what

1600
00:58:47,430 --> 00:58:45,599
percentage are still without job plans

1601
00:58:50,470 --> 00:58:47,440
what happens to you do you go back to

1602
00:58:52,309 --> 00:58:50,480
station ops and um are you going to

1603
00:58:53,910 --> 00:58:52,319
kennedy for the landings as so many

1604
00:58:55,270 --> 00:58:53,920
flight directors have done in the last

1605
00:58:58,630 --> 00:58:55,280
few flights

1606
00:59:01,829 --> 00:58:58,640
okay those are all good questions uh

1607
00:59:03,589 --> 00:59:01,839
i would say the the percentage of uh of

1608
00:59:04,470 --> 00:59:03,599
my team members

1609
00:59:09,829 --> 00:59:04,480
who

1610
00:59:12,870 --> 00:59:09,839
jobs

1611
00:59:14,870 --> 00:59:12,880
after the the mission i would say that's

1612
00:59:16,789 --> 00:59:14,880
maybe about a quarter of them about 25

1613
00:59:18,390 --> 00:59:16,799

percent of them

1614
00:59:20,230 --> 00:59:18,400
one of the things that that that

1615
00:59:22,069 --> 00:59:20,240
influences that is that some of my team

1616
00:59:25,430 --> 00:59:22,079
members are actually civil servants uh

1617
00:59:26,230 --> 00:59:25,440
most of them are contractors um but uh

1618
00:59:27,670 --> 00:59:26,240
uh

1619
00:59:29,670 --> 00:59:27,680
many of them are civil servants so i'd

1620
00:59:31,270 --> 00:59:29,680
say there's maybe about a quarter of my

1621
00:59:34,069 --> 00:59:31,280
team right now

1622
00:59:36,470 --> 00:59:34,079
that are still working on finding jobs

1623
00:59:39,030 --> 00:59:36,480
for uh for for post-flight

1624
00:59:40,390 --> 00:59:39,040
uh as far as whether or not uh whether

1625
00:59:42,549 --> 00:59:40,400
or not i'm going to go to kennedy for

1626
00:59:44,390 --> 00:59:42,559
the landing that's a good question

1627
00:59:46,789 --> 00:59:44,400
interestingly enough my boss asked me

1628
00:59:48,309 --> 00:59:46,799
the exact same question two days ago

1629
00:59:51,510 --> 00:59:48,319
i'm still thinking about it honestly on

1630
00:59:53,510 --> 00:59:51,520
the one hand uh it would be uh

1631
00:59:55,430 --> 00:59:53,520
an awesome awesome thing to go to

1632
00:59:56,950 --> 00:59:55,440
kennedy for for the landing and i've

1633
00:59:58,549 --> 00:59:56,960
actually never been to see a shuttle

1634
01:00:00,470 --> 00:59:58,559
landing interestingly enough i've never

1635
01:00:02,150 --> 01:00:00,480
seen a shuttle launch

1636
01:00:04,309 --> 01:00:02,160
so

1637
01:00:06,470 --> 01:00:04,319
that's a great opportunity

1638
01:00:08,390 --> 01:00:06,480

on the flip side given that this is the

1639
01:00:09,349 --> 01:00:08,400
last shuttle mission there's a part of

1640
01:00:11,510 --> 01:00:09,359
me and

1641
01:00:13,430 --> 01:00:11,520
and those that that know my personality

1642
01:00:16,230 --> 01:00:13,440
and know me would appreciate this

1643
01:00:18,309 --> 01:00:16,240
i feel a very strong desire to

1644
01:00:19,430 --> 01:00:18,319
end my career as a shuttle flight

1645
01:00:21,349 --> 01:00:19,440
director

1646
01:00:23,109 --> 01:00:21,359
exactly the way i've lived it which is

1647
01:00:26,309 --> 01:00:23,119
in mission control

1648
01:00:29,510 --> 01:00:26,319
making myself available to to be useful

1649
01:00:32,150 --> 01:00:29,520
if needed and so uh i'm still thinking

1650
01:00:34,309 --> 01:00:32,160
about it honestly i don't know

1651
01:00:35,910 --> 01:00:34,319
and as far as as far as is my

1652
01:00:38,230 --> 01:00:35,920
expectations for uh for what i'll be

1653
01:00:40,950 --> 01:00:38,240
doing after this mission is complete uh

1654
01:00:43,109 --> 01:00:40,960
as as you already know i actually grew

1655
01:00:45,349 --> 01:00:43,119
up on the space station side

1656
01:00:47,349 --> 01:00:45,359
although i've had an exciting career as

1657
01:00:49,109 --> 01:00:47,359
a space shuttle flight director

1658
01:00:50,230 --> 01:00:49,119
space station is the vehicle i was born

1659
01:00:52,390 --> 01:00:50,240
on if you will

1660
01:00:53,829 --> 01:00:52,400
as the vehicle i grew up on i started my

1661
01:00:56,309 --> 01:00:53,839
flight director career as a space

1662
01:00:58,069 --> 01:00:56,319
station flight director i still support

1663
01:00:59,589 --> 01:00:58,079

shifts routinely as a space station

1664
01:01:01,750 --> 01:00:59,599
flight director so

1665
01:01:04,390 --> 01:01:01,760
for me

1666
01:01:06,150 --> 01:01:04,400
personally the transition is not as

1667
01:01:07,670 --> 01:01:06,160
stark

1668
01:01:10,510 --> 01:01:07,680
because

1669
01:01:12,150 --> 01:01:10,520
you know shortly after a wheel stop on

1670
01:01:13,750 --> 01:01:12,160
sts-135

1671
01:01:15,430 --> 01:01:13,760
i'll probably see a schedule with uh

1672
01:01:17,270 --> 01:01:15,440
with my name listed on it for an

1673
01:01:19,510 --> 01:01:17,280
integrated simulation in the space

1674
01:01:22,069 --> 01:01:19,520
station training room or or shift in the

1675
01:01:24,390 --> 01:01:22,079
space space station flight control room

1676
01:01:25,910 --> 01:01:24,400
so as far as transitions my my thoughts

1677
01:01:27,510 --> 01:01:25,920
tend to be centered around uh the

1678
01:01:29,829 --> 01:01:27,520
members of my team

1679
01:01:31,750 --> 01:01:29,839
uh as i said i i

1680
01:01:34,549 --> 01:01:31,760
when i think about this mission

1681
01:01:37,109 --> 01:01:34,559
what i think about the most are those

1682
01:01:39,430 --> 01:01:37,119
people that i work with my teammates

1683
01:01:41,270 --> 01:01:39,440
those with or without jobs

1684
01:01:43,510 --> 01:01:41,280
it's it's the the thing that fills me

1685
01:01:45,190 --> 01:01:43,520
with the most pride and and a sense of

1686
01:01:48,549 --> 01:01:45,200
satisfaction is being associated with

1687
01:01:53,990 --> 01:01:50,230
mark

1688
01:01:55,829 --> 01:01:54,000

25 of home how many people are you

1689
01:01:57,589 --> 01:01:55,839
counting in that mix

1690
01:02:00,309 --> 01:01:57,599
total team number

1691
01:02:01,750 --> 01:02:00,319
for the people who are detailed to me

1692
01:02:06,470 --> 01:02:01,760
um

1693
01:02:08,470 --> 01:02:06,480
two dozen

1694
01:02:10,390 --> 01:02:08,480
and that includes the people that you

1695
01:02:12,470 --> 01:02:10,400
see in the in the in the front room as

1696
01:02:16,309 --> 01:02:12,480
well as their uh backroom support

1697
01:02:21,270 --> 01:02:18,630
mark kirkman mark kirkman interspace

1698
01:02:22,630 --> 01:02:21,280
news uh it's actually for both of you um

1699
01:02:24,309 --> 01:02:22,640
the since you're going through all the

1700
01:02:26,549 --> 01:02:24,319
extra trouble get this extra angle on

1701
01:02:28,069 --> 01:02:26,559
the undock fly around

1702
01:02:30,950 --> 01:02:28,079
what's preventing you from going the

1703
01:02:33,510 --> 01:02:30,960
full at least the full 360 and what do

1704
01:02:36,069 --> 01:02:33,520
you lose uh by not going that extra

1705
01:02:37,829 --> 01:02:36,079
quarter rev back to the r bar

1706
01:02:40,069 --> 01:02:37,839
yeah the purpose of uh of doing the

1707
01:02:42,470 --> 01:02:40,079
modified fly around with the station

1708
01:02:44,470 --> 01:02:42,480
yawing essentially 90 degrees is to be

1709
01:02:46,230 --> 01:02:44,480
able to image the sides of station that

1710
01:02:48,630 --> 01:02:46,240
we don't normally see so with the

1711
01:02:50,789 --> 01:02:48,640
shuttle out on the front uh of the of

1712
01:02:52,309 --> 01:02:50,799
the velocity vector starting to fly

1713
01:02:55,029 --> 01:02:52,319

around we'll be able to get images of

1714
01:02:57,109 --> 01:02:55,039
the the uh the plus y or the right hand

1715
01:02:59,589 --> 01:02:57,119
side the starboard side of space station

1716
01:03:01,029 --> 01:02:59,599
then as we fly over top uh to the back

1717
01:03:03,430 --> 01:03:01,039
side we'll be able to get pictures of

1718
01:03:06,549 --> 01:03:03,440
the minus wire port side of the station

1719
01:03:09,109 --> 01:03:06,559
so essentially uh we we effectively can

1720
01:03:11,029 --> 01:03:09,119
image the sides of the station that were

1721
01:03:12,870 --> 01:03:11,039
that we're after on the uh the modified

1722
01:03:14,390 --> 01:03:12,880
fly around we don't need to spend any

1723
01:03:15,910 --> 01:03:14,400
additional time uh

1724
01:03:18,230 --> 01:03:15,920
flying around the underside we get

1725
01:03:19,990 --> 01:03:18,240
plenty of views of the underside of

1726
01:03:22,390 --> 01:03:20,000
station when we come up to dock we get

1727
01:03:24,069 --> 01:03:22,400
plenty of photographic uh

1728
01:03:26,470 --> 01:03:24,079
documentation there to look for any

1729
01:03:28,390 --> 01:03:26,480
damage as quasi mentioned so we can

1730
01:03:29,990 --> 01:03:28,400
accomplish this in just half a lap

1731
01:03:30,870 --> 01:03:30,000
there's no need to spend any more crew

1732
01:03:32,789 --> 01:03:30,880
time

1733
01:03:34,549 --> 01:03:32,799
flight day 11 the undocking day is

1734
01:03:36,470 --> 01:03:34,559
extremely busy as quatty described

1735
01:03:38,390 --> 01:03:36,480
because after they undock and do their

1736
01:03:39,589 --> 01:03:38,400
separation burns the shuttle crew is

1737
01:03:41,589 --> 01:03:39,599
going to be jumping into their late

1738
01:03:43,430 --> 01:03:41,599

inspection to make sure that the thermal

1739
01:03:44,789 --> 01:03:43,440
protection system is safe for landing so

1740
01:03:49,670 --> 01:03:44,799
it's a very busy day and we don't want

1741
01:03:52,950 --> 01:03:50,829
uh phillip sloss with

1742
01:03:55,750 --> 01:03:52,960
nasaspaceflight.com a couple questions

1743
01:03:57,670 --> 01:03:55,760
uh for mr al barucho first um

1744
01:04:00,069 --> 01:03:57,680
the et camera

1745
01:04:02,069 --> 01:04:00,079
modification that that you're doing um

1746
01:04:03,829 --> 01:04:02,079
are there any expectations about what we

1747
01:04:05,910 --> 01:04:03,839
might see downrange

1748
01:04:07,670 --> 01:04:05,920
after wallops loses the signal from the

1749
01:04:09,270 --> 01:04:07,680
tank

1750
01:04:11,109 --> 01:04:09,280
that's a good question

1751
01:04:13,270 --> 01:04:11,119
i think right now we we don't know what

1752
01:04:15,910 --> 01:04:13,280
to expect and and and the modifications

1753
01:04:16,950 --> 01:04:15,920
he's referring to is uh that the

1754
01:04:19,510 --> 01:04:16,960
the camera that's mounted on the

1755
01:04:21,910 --> 01:04:19,520
external tank will will uh continue

1756
01:04:24,150 --> 01:04:21,920
transmitting uh longer than it normally

1757
01:04:25,670 --> 01:04:24,160
would after it separates from uh from

1758
01:04:27,510 --> 01:04:25,680
from atlantis

1759
01:04:29,349 --> 01:04:27,520
we're not going to be looking at that

1760
01:04:31,190 --> 01:04:29,359
imagery

1761
01:04:33,029 --> 01:04:31,200
on board atlantis that's going to go

1762
01:04:35,829 --> 01:04:33,039
straight to ground stations

1763
01:04:37,670 --> 01:04:35,839

and i don't think there are

1764
01:04:39,910 --> 01:04:37,680
any specific expectations about what

1765
01:04:41,430 --> 01:04:39,920
they'll see but since we'll see images

1766
01:04:43,270 --> 01:04:41,440
from that camera much longer than we

1767
01:04:44,630 --> 01:04:43,280
have in the past we're interested to see

1768
01:04:46,630 --> 01:04:44,640
what what we do see there might be

1769
01:04:49,349 --> 01:04:46,640
something that we learn from from from

1770
01:04:54,549 --> 01:04:51,910
and then for uh mr edelman um could you

1771
01:04:55,990 --> 01:04:54,559
just uh i guess clarify that you said

1772
01:04:58,789 --> 01:04:56,000
that the uh

1773
01:05:00,230 --> 01:04:58,799
the mplm up mass is second heaviest but

1774
01:05:02,390 --> 01:05:00,240
that the cargo is the heaviest stuff i

1775
01:05:04,549 --> 01:05:02,400
heard you correctly um is that just a

1776
01:05:06,470 --> 01:05:04,559
difference between leonardo and raphael

1777
01:05:09,670 --> 01:05:06,480
in terms of their dry weight that's

1778
01:05:11,430 --> 01:05:09,680
correct okay thank you and also the

1779
01:05:13,430 --> 01:05:11,440
it also pertains to the support

1780
01:05:17,029 --> 01:05:13,440
equipment inside the the module that

1781
01:05:21,349 --> 01:05:19,430
uh jim oberg with nbc news for both of

1782
01:05:23,109 --> 01:05:21,359
you uh you're all looking at the mission

1783
01:05:24,230 --> 01:05:23,119
but what kind of thoughts do you have in

1784
01:05:26,470 --> 01:05:24,240
terms of

1785
01:05:28,549 --> 01:05:26,480
end to mission ceremonial transfers or

1786
01:05:30,150 --> 01:05:28,559
events uh things you want to make sure

1787
01:05:31,829 --> 01:05:30,160
you remember people you make sure you

1788
01:05:33,349 --> 01:05:31,839

remember at the end do you have anything

1789
01:05:34,309 --> 01:05:33,359
in mind are you gonna are you gonna work

1790
01:05:36,630 --> 01:05:34,319
that out

1791
01:05:38,309 --> 01:05:36,640
pretty much in real time well that's a

1792
01:05:40,069 --> 01:05:38,319
good question um

1793
01:05:41,910 --> 01:05:40,079
of course at the end of this mission one

1794
01:05:43,829 --> 01:05:41,920
of the things that's traditional is that

1795
01:05:47,190 --> 01:05:43,839
uh we have what we call a plaque hanging

1796
01:05:48,870 --> 01:05:47,200
ceremony uh in mission control as you've

1797
01:05:49,750 --> 01:05:48,880
probably seen on cameras we have plaques

1798
01:05:51,349 --> 01:05:49,760
that are

1799
01:05:52,789 --> 01:05:51,359
made in the image of the crew patches

1800
01:05:54,950 --> 01:05:52,799
for for the mission and the program

1801
01:05:56,950 --> 01:05:54,960
patches for the mission uh we award

1802
01:05:59,270 --> 01:05:56,960
those plaques to the the individuals or

1803
01:06:01,589 --> 01:05:59,280
disciplines that we feel uh most

1804
01:06:02,789 --> 01:06:01,599
significantly contributed to uh mission

1805
01:06:05,270 --> 01:06:02,799
success

1806
01:06:07,829 --> 01:06:05,280
uh for uh for each uh each program one

1807
01:06:10,789 --> 01:06:07,839
for shuttle and and uh and typically two

1808
01:06:12,630 --> 01:06:10,799
for for space station um i think this

1809
01:06:15,670 --> 01:06:12,640
plaque hanging will be a particularly uh

1810
01:06:18,870 --> 01:06:15,680
poignant one uh in that uh there'll be

1811
01:06:20,870 --> 01:06:18,880
uh certainly a lot of emotion uh that

1812
01:06:22,390 --> 01:06:20,880
that i think will be surrounding uh the

1813
01:06:24,630 --> 01:06:22,400

the final space

1814
01:06:26,789 --> 01:06:24,640
shuttle space station assembly uh plaque

1815
01:06:29,349 --> 01:06:26,799
hanging there will be other ceremonies

1816
01:06:31,750 --> 01:06:29,359
like that uh as we as i said before uh

1817
01:06:34,150 --> 01:06:31,760
we're certainly not ending human space

1818
01:06:36,069 --> 01:06:34,160
uh contrary to what some have have said

1819
01:06:37,829 --> 01:06:36,079
uh the space station will continue uh

1820
01:06:40,470 --> 01:06:37,839
continue missions they'll

1821
01:06:41,910 --> 01:06:40,480
be a continuation of uh resupply

1822
01:06:43,670 --> 01:06:41,920
missions as well as crude missions to

1823
01:06:45,190 --> 01:06:43,680
the space station and and the

1824
01:06:46,870 --> 01:06:45,200
traditional ceremonies that go along

1825
01:06:50,309 --> 01:06:46,880
with that

1826
01:06:52,470 --> 01:06:50,319
but i think that the focus will be to

1827
01:06:54,390 --> 01:06:52,480
make sure that we appropriately honor

1828
01:06:57,190 --> 01:06:54,400
those people who have not only

1829
01:06:59,109 --> 01:06:57,200
contributed to this mission but to

1830
01:07:01,190 --> 01:06:59,119
respectfully honor the contributions of

1831
01:07:03,510 --> 01:07:01,200
those who've enabled

1832
01:07:05,589 --> 01:07:03,520
the success of the shuttle program

1833
01:07:07,029 --> 01:07:05,599
all the things that we've learned in the

1834
01:07:09,750 --> 01:07:07,039
shuttle program

1835
01:07:11,829 --> 01:07:09,760
you know the the capabilities that nasa

1836
01:07:13,029 --> 01:07:11,839
has today and when i talk about

1837
01:07:14,549 --> 01:07:13,039
capabilities i'm talking about

1838
01:07:15,829 --> 01:07:14,559

capabilities of knowledge things that we

1839
01:07:18,470 --> 01:07:15,839
know how to do

1840
01:07:20,069 --> 01:07:18,480
uh these capabilities are the result of

1841
01:07:22,069 --> 01:07:20,079
of fiscal investments that have been

1842
01:07:26,150 --> 01:07:22,079
made in these programs uh and they're

1843
01:07:28,710 --> 01:07:26,160
also the the the result of investment of

1844
01:07:30,870 --> 01:07:28,720
lives and life's work and so uh the

1845
01:07:33,190 --> 01:07:30,880
focus will really be on on appropriately

1846
01:07:35,829 --> 01:07:33,200
honoring that and the people who

1847
01:07:38,630 --> 01:07:35,839
contributed as far as additional

1848
01:07:41,510 --> 01:07:38,640
ceremonies i think

1849
01:07:43,990 --> 01:07:41,520
there will be there'll be

1850
01:07:46,710 --> 01:07:44,000
many more that will do in the coming

1851
01:07:48,630 --> 01:07:46,720
days uh one thing that that i think is

1852
01:07:51,190 --> 01:07:48,640
is worth emphasizing

1853
01:07:52,870 --> 01:07:51,200
is that this team

1854
01:07:55,750 --> 01:07:52,880
and the people here at johnson space

1855
01:07:57,750 --> 01:07:55,760
center have not been tremendously

1856
01:07:58,710 --> 01:07:57,760
focused on this flight as the last

1857
01:08:02,150 --> 01:07:58,720
flight

1858
01:08:03,510 --> 01:08:02,160
uh the prevailing sense that i get from

1859
01:08:06,230 --> 01:08:03,520
all of the people supporting this

1860
01:08:07,829 --> 01:08:06,240
mission from uh the program office

1861
01:08:09,510 --> 01:08:07,839
personnel who are

1862
01:08:11,270 --> 01:08:09,520
putting together the requirements and

1863
01:08:13,349 --> 01:08:11,280

and making sure that the hardware is is

1864
01:08:14,870 --> 01:08:13,359
fit uh to the people on my flight

1865
01:08:16,470 --> 01:08:14,880
control team who are preparing to

1866
01:08:18,070 --> 01:08:16,480
execute this mission

1867
01:08:20,229 --> 01:08:18,080
the prevailing sense and the and the

1868
01:08:23,189 --> 01:08:20,239
prevailing desire is

1869
01:08:25,669 --> 01:08:23,199
to fly this mission safely and

1870
01:08:27,510 --> 01:08:25,679
successfully because we think that is

1871
01:08:28,709 --> 01:08:27,520
that is the most powerful legacy that we

1872
01:08:31,269 --> 01:08:28,719
could leave

1873
01:08:32,870 --> 01:08:31,279
for this program and so uh

1874
01:08:35,269 --> 01:08:32,880
you know one of the side effects of that

1875
01:08:36,470 --> 01:08:35,279
is that we really haven't thought as

1876
01:08:38,550 --> 01:08:36,480
much

1877
01:08:40,709 --> 01:08:38,560
about uh commemorating

1878
01:08:46,390 --> 01:08:40,719
lasts and finals and

1879
01:08:52,229 --> 01:08:49,590
alan alan boyle with msnbc uh i wanted

1880
01:08:54,950 --> 01:08:52,239
to ask how the flight directors will

1881
01:08:58,789 --> 01:08:54,960
transition to the commercial

1882
01:09:00,870 --> 01:08:58,799
resupply and eventually crew transfer

1883
01:09:02,789 --> 01:09:00,880
era is there going to be a fundamental

1884
01:09:05,110 --> 01:09:02,799
change in the way that you're going to

1885
01:09:07,269 --> 01:09:05,120
be doing your job or in the way that

1886
01:09:10,390 --> 01:09:07,279
your teams are going to be organized

1887
01:09:12,229 --> 01:09:10,400
that's a great question and uh uh i let

1888
01:09:13,990 --> 01:09:12,239

me apologize in advance for for the

1889
01:09:15,590 --> 01:09:14,000
answer but it does have the the

1890
01:09:17,349 --> 01:09:15,600
tremendous virtue of being true which is

1891
01:09:19,430 --> 01:09:17,359
uh i don't know

1892
01:09:21,110 --> 01:09:19,440
we haven't we haven't gotten

1893
01:09:23,510 --> 01:09:21,120
far enough along

1894
01:09:25,910 --> 01:09:23,520
in the development of those programs for

1895
01:09:26,789 --> 01:09:25,920
there to exist a cogent answer to that

1896
01:09:28,950 --> 01:09:26,799
question

1897
01:09:30,709 --> 01:09:28,960
what i can tell you though is that

1898
01:09:31,590 --> 01:09:30,719
we have a very strong flight director

1899
01:09:34,550 --> 01:09:31,600
core

1900
01:09:37,110 --> 01:09:34,560
the vast majority of us are

1901
01:09:38,229 --> 01:09:37,120
are qualified on international space

1902
01:09:40,630 --> 01:09:38,239
station

1903
01:09:42,149 --> 01:09:40,640
most of our our our space shuttle flight

1904
01:09:43,910 --> 01:09:42,159
directors minus

1905
01:09:46,149 --> 01:09:43,920
minus two or three

1906
01:09:48,390 --> 01:09:46,159
are also space station flight directors

1907
01:09:49,669 --> 01:09:48,400
so for us we will continue to serve in

1908
01:09:51,269 --> 01:09:49,679
the role that we have historically

1909
01:09:52,709 --> 01:09:51,279
played

1910
01:09:56,070 --> 01:09:52,719
with respect to the international space

1911
01:09:59,030 --> 01:09:56,080
station program and also

1912
01:10:01,350 --> 01:09:59,040
serving in leadership roles leading the

1913
01:10:03,910 --> 01:10:01,360

development of of the operational

1914
01:10:06,390 --> 01:10:03,920
philosophies and the interfaces uh to

1915
01:10:08,709 --> 01:10:06,400
the commercial providers as far as who

1916
01:10:11,189 --> 01:10:08,719
will uh who will actually provide

1917
01:10:15,030 --> 01:10:11,199
tactical real-time command and control

1918
01:10:16,310 --> 01:10:15,040
of of and operations of those spacecraft

1919
01:10:17,990 --> 01:10:16,320
you know those are things that i think

1920
01:10:19,830 --> 01:10:18,000
are still being discussed and there

1921
01:10:21,830 --> 01:10:19,840
there are a variety of models that that

1922
01:10:23,669 --> 01:10:21,840
may work and uh

1923
01:10:25,590 --> 01:10:23,679
i think if you ask that same question

1924
01:10:28,070 --> 01:10:25,600
again in another year you'll probably

1925
01:10:30,229 --> 01:10:28,080
get a more detailed answer to that

1926
01:10:32,550 --> 01:10:30,239
right just quickly does the russian

1927
01:10:35,189 --> 01:10:32,560
mission control model provide one of

1928
01:10:37,350 --> 01:10:35,199
those models would it work uh that way

1929
01:10:39,510 --> 01:10:37,360
where you have separate commercial

1930
01:10:41,830 --> 01:10:39,520
and uh space station for example mission

1931
01:10:43,910 --> 01:10:41,840
controls

1932
01:10:46,709 --> 01:10:43,920
i think i think the russian the russian

1933
01:10:48,470 --> 01:10:46,719
flight control model is uh is one model

1934
01:10:51,110 --> 01:10:48,480
certainly uh

1935
01:10:53,110 --> 01:10:51,120
in in my personal uh personal experience

1936
01:10:55,189 --> 01:10:53,120
uh working with the russian teams there

1937
01:10:57,510 --> 01:10:55,199
are some uh some some obvious strengths

1938
01:11:00,470 --> 01:10:57,520

of that model it seems to work for them

1939
01:11:03,110 --> 01:11:00,480
um but uh you know it might may or may

1940
01:11:05,669 --> 01:11:03,120
not be the right right tool for for this

1941
01:11:08,709 --> 01:11:05,679
set of companies with with uh our

1942
01:11:11,430 --> 01:11:08,719
culture and uh and our capabilities and

1943
01:11:13,669 --> 01:11:11,440
and our uh our core rigidities

1944
01:11:15,030 --> 01:11:13,679
so uh that's something that that folks

1945
01:11:16,950 --> 01:11:15,040
are going to be looking at uh the

1946
01:11:18,390 --> 01:11:16,960
russian model does provide us an example

1947
01:11:20,709 --> 01:11:18,400
to evaluate

1948
01:11:22,550 --> 01:11:20,719
um but i'm not 100

1949
01:11:23,910 --> 01:11:22,560
convinced that it'll evolve uh it'll

1950
01:11:26,070 --> 01:11:23,920
evolve to look exactly the way the

1951
01:11:28,790 --> 01:11:26,080
russian teams look

1952
01:11:31,430 --> 01:11:28,800
additional questions here uh let's go in

1953
01:11:33,750 --> 01:11:31,440
the front denise and then gina

1954
01:11:35,990 --> 01:11:33,760
uh denise childspace.com just to follow

1955
01:11:37,270 --> 01:11:36,000
up with tracy's question um

1956
01:11:38,790 --> 01:11:37,280
because there are only four members of

1957
01:11:40,390 --> 01:11:38,800
the shuttle crew are you anticipating

1958
01:11:42,310 --> 01:11:40,400
that they'll have or face a lot more

1959
01:11:45,110 --> 01:11:42,320
stress or pressure not just on

1960
01:11:46,470 --> 01:11:45,120
inspection and docking days but for the

1961
01:11:48,149 --> 01:11:46,480
the rest of the mission with the cargo

1962
01:11:49,189 --> 01:11:48,159
transfers and everything

1963
01:11:51,110 --> 01:11:49,199

okay

1964
01:11:52,790 --> 01:11:51,120
question about uh additional stress and

1965
01:11:54,070 --> 01:11:52,800
pressure because the reduced reduced

1966
01:11:55,830 --> 01:11:54,080
crew size

1967
01:11:56,950 --> 01:11:55,840
one thing that that i've observed from

1968
01:11:59,990 --> 01:11:56,960
this crew

1969
01:12:03,110 --> 01:12:00,000
in addition to their their incredible uh

1970
01:12:05,430 --> 01:12:03,120
resumes and portfolio of skills uh is

1971
01:12:06,470 --> 01:12:05,440
this is a crew that works very very well

1972
01:12:09,030 --> 01:12:06,480
together

1973
01:12:11,830 --> 01:12:09,040
i tell you just as uh as as far as the

1974
01:12:14,229 --> 01:12:11,840
personalities involved uh

1975
01:12:15,270 --> 01:12:14,239
this is a a very

1976
01:12:17,750 --> 01:12:15,280
um

1977
01:12:19,910 --> 01:12:17,760
this this is a crew that that's got

1978
01:12:20,870 --> 01:12:19,920
i believe an incredible uh joie de vivre

1979
01:12:22,790 --> 01:12:20,880
if you will

1980
01:12:24,870 --> 01:12:22,800
they enjoy what they do

1981
01:12:28,149 --> 01:12:24,880
uh they enjoy working together they

1982
01:12:30,229 --> 01:12:28,159
enjoy each other and so uh what i've

1983
01:12:32,310 --> 01:12:30,239
been most impressed with uh from this

1984
01:12:35,110 --> 01:12:32,320
crew is uh how they've

1985
01:12:36,550 --> 01:12:35,120
examined all of the challenges that that

1986
01:12:39,350 --> 01:12:36,560
they have

1987
01:12:41,990 --> 01:12:39,360
and uh they've simply

1988
01:12:44,950 --> 01:12:42,000

put their intellects and their skills uh

1989
01:12:46,870 --> 01:12:44,960
to work at finding solutions and and uh

1990
01:12:49,830 --> 01:12:46,880
to those problems and and mitigating

1991
01:12:52,070 --> 01:12:49,840
those challenges uh as i've worked very

1992
01:12:54,870 --> 01:12:52,080
closely with uh commander chris ferguson

1993
01:12:56,709 --> 01:12:54,880
uh over the last uh several months uh

1994
01:12:58,790 --> 01:12:56,719
he's uh he's he's

1995
01:13:00,709 --> 01:12:58,800
great at highlighting to me

1996
01:13:02,149 --> 01:13:00,719
uh issues and things that they are

1997
01:13:04,870 --> 01:13:02,159
concerned about

1998
01:13:06,709 --> 01:13:04,880
um but uh he doesn't very easily display

1999
01:13:08,709 --> 01:13:06,719
uh worry in the traditional sense that

2000
01:13:10,229 --> 01:13:08,719
you may think of people worrying

2001
01:13:11,430 --> 01:13:10,239
so this is a very confident crew they're

2002
01:13:13,270 --> 01:13:11,440
very competent

2003
01:13:16,310 --> 01:13:13,280
and we're going to do our part on the

2004
01:13:17,990 --> 01:13:16,320
ground to to keep things as

2005
01:13:20,550 --> 01:13:18,000
stable for them as possible so that they

2006
01:13:22,310 --> 01:13:20,560
can feel the challenges of this mission

2007
01:13:24,149 --> 01:13:22,320
even though there are fewer number of

2008
01:13:25,669 --> 01:13:24,159
them uh and i believe they're really

2009
01:13:26,870 --> 01:13:25,679
going to be they're really going to be

2010
01:13:28,229 --> 01:13:26,880
fine and they're going to do they're

2011
01:13:30,149 --> 01:13:28,239
going to do great i've got just

2012
01:13:32,550 --> 01:13:30,159
tremendous admiration and respect for

2013
01:13:33,669 --> 01:13:32,560

for this crew

2014
01:13:36,149 --> 01:13:33,679
gina

2015
01:13:38,709 --> 01:13:36,159
uh genus and sari abc news for chris two

2016
01:13:41,030 --> 01:13:38,719
questions um got a lot of stuff going

2017
01:13:43,270 --> 01:13:41,040
back and forth so what was your secret

2018
01:13:44,950 --> 01:13:43,280
post-it notes barcode scanners how do

2019
01:13:47,669 --> 01:13:44,960
you keep track of everything going back

2020
01:13:49,830 --> 01:13:47,679
and forth well we use color coding

2021
01:13:51,910 --> 01:13:49,840
believe it or not the things that uh

2022
01:13:53,990 --> 01:13:51,920
that are to go up into the space station

2023
01:13:55,750 --> 01:13:54,000
be left there are typically colored with

2024
01:13:58,149 --> 01:13:55,760
a yellow label the crew remembers that

2025
01:13:59,669 --> 01:13:58,159
by yellow means it goes towards the sun

2026
01:14:01,910 --> 01:13:59,679
and the items to be brought back to

2027
01:14:04,470 --> 01:14:01,920
earth are have a green label going back

2028
01:14:05,990 --> 01:14:04,480
to the grass uh the food that was done

2029
01:14:07,830 --> 01:14:06,000
by a different different group and it's

2030
01:14:10,149 --> 01:14:07,840
blue labeled but we all know all the

2031
01:14:11,350 --> 01:14:10,159
food is going to end up on the station

2032
01:14:14,070 --> 01:14:11,360
so

2033
01:14:15,750 --> 01:14:14,080
the colors help the crew to uh to keep

2034
01:14:17,750 --> 01:14:15,760
track of where things go each item is

2035
01:14:19,990 --> 01:14:17,760
also labeled with specific

2036
01:14:21,990 --> 01:14:20,000
location label codes and part numbers

2037
01:14:23,430 --> 01:14:22,000
and serial numbers and we keep track of

2038
01:14:25,990 --> 01:14:23,440

all that in a database that's one of the

2039
01:14:27,990 --> 01:14:26,000
functions we perform here in mission

2040
01:14:29,750 --> 01:14:28,000
control houston keeping track of where

2041
01:14:31,669 --> 01:14:29,760
everything is located and we'll follow

2042
01:14:33,669 --> 01:14:31,679
closely what their crew reports at the

2043
01:14:36,310 --> 01:14:33,679
end of the day sandy magnus will will

2044
01:14:37,830 --> 01:14:36,320
call down and report which items in her

2045
01:14:39,830 --> 01:14:37,840
transfer list were stowed we have the

2046
01:14:43,189 --> 01:14:39,840
same list on the ground and we'll enter

2047
01:14:46,550 --> 01:14:43,199
all that into the into the database

2048
01:14:48,229 --> 01:14:46,560
and uh and for chris i imagine that uh

2049
01:14:50,709 --> 01:14:48,239
you know it was very competitive getting

2050
01:14:51,990 --> 01:14:50,719
something on the going up list was there

2051
01:14:53,990 --> 01:14:52,000
anything that you would have liked to

2052
01:14:57,110 --> 01:14:54,000
have gotten on that list that you didn't

2053
01:14:59,030 --> 01:14:57,120
was there a last call for ideas

2054
01:15:00,709 --> 01:14:59,040
you know actually the

2055
01:15:03,350 --> 01:15:00,719
you know food is always something we

2056
01:15:04,790 --> 01:15:03,360
need more of um but the the space

2057
01:15:07,110 --> 01:15:04,800
station program actually did a

2058
01:15:09,030 --> 01:15:07,120
phenomenal job because when this mission

2059
01:15:10,550 --> 01:15:09,040
was first identified as being a you know

2060
01:15:13,910 --> 01:15:10,560
this was really going to happen that was

2061
01:15:15,750 --> 01:15:13,920
about nine months ago

2062
01:15:18,390 --> 01:15:15,760
initially the folks in the space station

2063
01:15:21,189 --> 01:15:18,400

program said we can't possibly have

2064
01:15:22,870 --> 01:15:21,199
enough cargo to fill up a logistics

2065
01:15:24,550 --> 01:15:22,880
module we just can't get it together in

2066
01:15:26,790 --> 01:15:24,560
time because you know the spare parts

2067
01:15:28,950 --> 01:15:26,800
have to be manufactured and inspected

2068
01:15:30,870 --> 01:15:28,960
the food has to be produced and there's

2069
01:15:32,550 --> 01:15:30,880
a long supply chain that has to take

2070
01:15:34,229 --> 01:15:32,560
place and the material has to you know

2071
01:15:36,310 --> 01:15:34,239
it can't be ready just on launch day you

2072
01:15:38,149 --> 01:15:36,320
can see that it you know from from the

2073
01:15:40,310 --> 01:15:38,159
video there of the work at kennedy space

2074
01:15:42,630 --> 01:15:40,320
center it takes several months to load

2075
01:15:44,149 --> 01:15:42,640
up an mplm and it has the other the

2076
01:15:46,070 --> 01:15:44,159
cargo has to be processed even before

2077
01:15:47,990 --> 01:15:46,080
that so it was a huge challenge in the

2078
01:15:49,669 --> 01:15:48,000
space station program really really rose

2079
01:15:51,910 --> 01:15:49,679
the occasion and mike suffordini is very

2080
01:15:54,229 --> 01:15:51,920
pleased that we were able to literally

2081
01:15:57,990 --> 01:15:54,239
fill up the mplm it's as full as it can

2082
01:15:59,990 --> 01:15:58,000
be as you saw from that video

2083
01:16:02,630 --> 01:16:00,000
any last questions uh we'll take one

2084
01:16:04,550 --> 01:16:02,640
more from irene then close it out thanks

2085
01:16:05,990 --> 01:16:04,560
i ring thoughts with reuters uh for

2086
01:16:07,110 --> 01:16:06,000
either one of you would like to answer

2087
01:16:08,790 --> 01:16:07,120
this um

2088
01:16:10,950 --> 01:16:08,800

what's your biggest concern about not

2089
01:16:13,270 --> 01:16:10,960
having shuttle for station logistics

2090
01:16:14,709 --> 01:16:13,280
support

2091
01:16:16,550 --> 01:16:14,719
well the biggest concern about not

2092
01:16:18,870 --> 01:16:16,560
having the shuttle available in the

2093
01:16:20,709 --> 01:16:18,880
future is the the unique capabilities

2094
01:16:22,630 --> 01:16:20,719
that the shuttle provides bringing up

2095
01:16:24,790 --> 01:16:22,640
really big stuff

2096
01:16:27,110 --> 01:16:24,800
big spares that can't fit for example in

2097
01:16:29,430 --> 01:16:27,120
the uh the trunk which is the uh the

2098
01:16:31,910 --> 01:16:29,440
external stowage location of a spacex

2099
01:16:33,750 --> 01:16:31,920
dragon for example or you know the items

2100
01:16:35,510 --> 01:16:33,760
that come up on a progress freighter

2101
01:16:38,550 --> 01:16:35,520
those have to fit through the relatively

2102
01:16:40,630 --> 01:16:38,560
small russian hatch so uh

2103
01:16:42,310 --> 01:16:40,640
that's the big concern is is bringing up

2104
01:16:44,229 --> 01:16:42,320
large spare parts

2105
01:16:46,790 --> 01:16:44,239
and also the shuttle provides a lot of

2106
01:16:49,270 --> 01:16:46,800
down mass capability uh i described how

2107
01:16:52,390 --> 01:16:49,280
we are bringing back over 6 000 pounds

2108
01:16:54,229 --> 01:16:52,400
of cargo on on the shuttle return now

2109
01:16:57,510 --> 01:16:54,239
these concerns have been addressed

2110
01:16:59,350 --> 01:16:57,520
through the design of our uh

2111
01:17:01,350 --> 01:16:59,360
the other robotic spacecraft that will

2112
01:17:03,990 --> 01:17:01,360
be servicing space station i mentioned

2113
01:17:07,350 --> 01:17:04,000

that spacex can carry moderate size

2114
01:17:10,630 --> 01:17:07,360
spares in its trunk the uh the japanese

2115
01:17:13,110 --> 01:17:10,640
htv also has an external cargo platform

2116
01:17:14,470 --> 01:17:13,120
it can bring up spares and we've also

2117
01:17:16,870 --> 01:17:14,480
you know made a strong effort on the

2118
01:17:19,350 --> 01:17:16,880
station program to pre-position

2119
01:17:21,350 --> 01:17:19,360
lots of spares for example that the pump

2120
01:17:23,510 --> 01:17:21,360
module that failed we have three pump

2121
01:17:24,790 --> 01:17:23,520
modules already up on the outside of

2122
01:17:26,630 --> 01:17:24,800
station uh

2123
01:17:28,950 --> 01:17:26,640
stored as spares and we'll plug them in

2124
01:17:31,110 --> 01:17:28,960
as as needed so so we've really looked

2125
01:17:33,430 --> 01:17:31,120
ahead to try to see what capabilities we

2126
01:17:36,390 --> 01:17:33,440
lose with the shuttle and uh and to try

2127
01:17:38,630 --> 01:17:36,400
to adapt to that

2128
01:17:41,910 --> 01:17:38,640
okay that'll wrap up the questions uh

2129
01:17:43,669 --> 01:17:41,920
actually no more one more just one more

2130
01:17:45,830 --> 01:17:43,679
phillips loss with nasaspaceflight.com

2131
01:17:47,669 --> 01:17:45,840
again just to follow denise's uh

2132
01:17:49,350 --> 01:17:47,679
question earlier is there anything that

2133
01:17:52,310 --> 01:17:49,360
the the flight control team can do on

2134
01:17:55,990 --> 01:17:52,320
the ground to reduce some of the crew uh

2135
01:17:59,830 --> 01:17:57,910
well there's uh there there are a few

2136
01:18:01,270 --> 01:17:59,840
things the first uh and most important

2137
01:18:03,910 --> 01:18:01,280
thing that we can do to reduce some of

2138
01:18:06,709 --> 01:18:03,920

the crew work is to uh make sure that

2139
01:18:08,709 --> 01:18:06,719
the procedures and uh and um

2140
01:18:11,189 --> 01:18:08,719
documentation that the crew has are

2141
01:18:13,430 --> 01:18:11,199
correct uh rework

2142
01:18:15,669 --> 01:18:13,440
you know is is a is a fact of complex

2143
01:18:17,910 --> 01:18:15,679
space flight but minimizing that would

2144
01:18:20,470 --> 01:18:17,920
really really help the crew uh my flight

2145
01:18:22,390 --> 01:18:20,480
control team has done a great job of of

2146
01:18:24,229 --> 01:18:22,400
looking at things that might need to be

2147
01:18:26,390 --> 01:18:24,239
different in our procedures as a result

2148
01:18:27,910 --> 01:18:26,400
of the reduced crew complement and i

2149
01:18:29,750 --> 01:18:27,920
think we've got a pretty good handle on

2150
01:18:31,910 --> 01:18:29,760
that

2151
01:18:34,390 --> 01:18:31,920
on the space station side one of the

2152
01:18:35,990 --> 01:18:34,400
great things about space station is that

2153
01:18:38,149 --> 01:18:36,000
those core spacecraft systems are

2154
01:18:40,950 --> 01:18:38,159
largely operated by the mission control

2155
01:18:41,990 --> 01:18:40,960
team and so off loading the crew from a

2156
01:18:43,910 --> 01:18:42,000
lot of the

2157
01:18:45,830 --> 01:18:43,920
systems commanding and systems operation

2158
01:18:47,990 --> 01:18:45,840
that they have to do uh with the core

2159
01:18:50,070 --> 01:18:48,000
spacecraft systems that also uh that

2160
01:18:51,590 --> 01:18:50,080
also helps quite a bit one of the things

2161
01:18:53,270 --> 01:18:51,600
that uh that one of my flight

2162
01:18:55,110 --> 01:18:53,280
controllers is going to do my

2163
01:18:57,990 --> 01:18:55,120

communications and instrumentation

2164
01:19:01,030 --> 01:18:58,000
officer uh she's going to uh operate all

2165
01:19:03,110 --> 01:19:01,040
of the the cameras for the crew uh many

2166
01:19:04,630 --> 01:19:03,120
times the crew would pan and tilt their

2167
01:19:07,110 --> 01:19:04,640
cameras as they're doing their robotics

2168
01:19:08,870 --> 01:19:07,120
tasks uh for unbirthing the mplm or

2169
01:19:10,870 --> 01:19:08,880
maneuvering uh

2170
01:19:12,630 --> 01:19:10,880
space suited crew members from one part

2171
01:19:14,070 --> 01:19:12,640
of the space station to another

2172
01:19:16,149 --> 01:19:14,080
we're going to run the cameras for them

2173
01:19:17,669 --> 01:19:16,159
again to essentially provide an extra

2174
01:19:19,030 --> 01:19:17,679
set of hands from the ground so these

2175
01:19:20,870 --> 01:19:19,040
are just a few things that we'll be able

2176
01:19:22,709 --> 01:19:20,880
to do

2177
01:19:24,790 --> 01:19:22,719
all right great that closes out the

2178
01:19:26,070 --> 01:19:24,800
questions for today quasi-chris thanks

2179
01:19:27,750 --> 01:19:26,080
very much

2180
01:19:29,750 --> 01:19:27,760
uh just a couple of programming notes

2181
01:19:32,149 --> 01:19:29,760
before we close coming up next on nasa

2182
01:19:34,070 --> 01:19:32,159
television the nasa tv video file out of

2183
01:19:35,510 --> 01:19:34,080
headquarters with agency-wide news and

2184
01:19:37,430 --> 01:19:35,520
video

2185
01:19:40,070 --> 01:19:37,440
and then that'll be followed at

2186
01:19:43,669 --> 01:19:40,080
noon central time 1 p.m eastern time by

2187
01:19:46,070 --> 01:19:43,679
the sts-135 spacewalk overview briefing

2188
01:19:48,310 --> 01:19:46,080

an hour after that at 1 pm central time

2189
01:19:50,310 --> 01:19:48,320
2 eastern the final pre-launch news

2190
01:19:52,229 --> 01:19:50,320
conference for atlanta's four astronauts

2191
01:19:54,070 --> 01:19:52,239
so you'll want to stay tuned for that

2192
01:19:55,430 --> 01:19:54,080
you can follow everything associated

2193
01:20:00,149 --> 01:19:55,440
with the final flight of the space

2194
01:20:05,189 --> 01:20:02,790
stay tuned as coverage of the sts-135