
Space Cen
Center

1
00:00:07,400 --> 00:00:04,999
good morning welcome today's mission

2
00:00:08,900 --> 00:00:07,410
status breathing with us today is lead

3
00:00:10,940 --> 00:00:08,910
shuttle flight director quat see a

4
00:00:14,660 --> 00:00:10,950
laburo just coming off his orbit one

5
00:00:17,029 --> 00:00:14,670
shift what see good morning well the

6
00:00:20,210 --> 00:00:17,039
crew is continuing to have a fantastic

7
00:00:23,269 --> 00:00:20,220
time on orbit today we have finished

8
00:00:26,390 --> 00:00:23,279
packing of the NP LM the crew closed it

9
00:00:28,700 --> 00:00:26,400
out and as we speak they're completing

10
00:00:31,400 --> 00:00:28,710
the birthing activities which involve

11
00:00:33,830 --> 00:00:31,410
placing the MPL em back in the orbiters

12
00:00:36,740 --> 00:00:33,840
payload Bay with the space station

13
00:00:38,840 --> 00:00:36,750

robotic arm what's ahead of the crew for

14
00:00:40,490 --> 00:00:38,850
the rest of the day is to finish

15
00:00:42,110 --> 00:00:40,500
mid-deck transfer they have about

16
00:00:45,080 --> 00:00:42,120
another hour to hour and a half of mid

17
00:00:47,330 --> 00:00:45,090
dick transfer to complete and then

18
00:00:50,569 --> 00:00:47,340
they'll be egressing the international

19
00:00:53,619 --> 00:00:50,579
space station closing hatches saying

20
00:00:56,180 --> 00:00:53,629
their farewells to the station crew and

21
00:00:58,610 --> 00:00:56,190
preparing to do the check out of their

22
00:01:01,310 --> 00:00:58,620
rendezvous tools which will be used for

23
00:01:03,650 --> 00:01:01,320
tomorrow's undocking and fly around on

24
00:01:07,240 --> 00:01:03,660
the plan tomorrow shortly after the crew

25
00:01:10,280 --> 00:01:07,250
wakes up they'll be powering up the

26
00:01:12,050 --> 00:01:10,290
additional computers that they'll use

27
00:01:14,120 --> 00:01:12,060
for undocking as well as some of the

28
00:01:17,690 --> 00:01:14,130
additional equipment that's required and

29
00:01:20,630 --> 00:01:17,700
will maneuver the space station shuttle

30
00:01:22,789 --> 00:01:20,640
stack to the undocking attitude and then

31
00:01:25,940 --> 00:01:22,799
fairly early in the cruise day they will

32
00:01:27,679 --> 00:01:25,950
undock and and back away from the space

33
00:01:30,980 --> 00:01:27,689
station while the space station performs

34
00:01:32,810 --> 00:01:30,990
an attitude maneuver and do a half lap

35
00:01:34,700 --> 00:01:32,820
fly around of the international space

36
00:01:36,140 --> 00:01:34,710
station and then separate completely

37
00:01:38,539 --> 00:01:36,150
from the space stations orbit and

38
00:01:41,450 --> 00:01:38,549

conduct their late inspection activities

39
00:01:43,730 --> 00:01:41,460
which involves using the orbiter boom

40
00:01:46,760 --> 00:01:43,740
sensor system and the associated sensor

41
00:01:47,840 --> 00:01:46,770
packages to look for any damage that

42
00:01:50,090 --> 00:01:47,850
might have occurred to the thermal

43
00:01:52,069 --> 00:01:50,100
protection system during its time docked

44
00:01:54,139 --> 00:01:52,079
to the International Space Station now

45
00:01:55,969 --> 00:01:54,149
just refresh your memory as to what we

46
00:01:58,550 --> 00:01:55,979
can expect during the undocking

47
00:02:01,130 --> 00:01:58,560
fly-around we do have a video clip with

48
00:02:03,709 --> 00:02:01,140
an animation of what we expect the two

49
00:02:06,109 --> 00:02:03,719
spacecraft to be doing during the the

50
00:02:08,029 --> 00:02:06,119
undocking activities there you see the

51
00:02:11,059 --> 00:02:08,039
shuttle backing away from the space

52
00:02:14,030 --> 00:02:11,069
station pilot Doug Hurley will back away

53
00:02:15,949 --> 00:02:14,040
to about 600 feet and then the ISS

54
00:02:20,509 --> 00:02:15,959
will basically do a simple 90 degree yah

55
00:02:22,399 --> 00:02:20,519
maneuver to present the off-axis to the

56
00:02:25,039 --> 00:02:22,409
orbiter and while the other crew members

57
00:02:28,610 --> 00:02:25,049
are taking pictures pilot Doug Hurley

58
00:02:30,830 --> 00:02:28,620
will maneuver the spacecraft into about

59
00:02:34,069 --> 00:02:30,840
a half to three quarter lap fly around

60
00:02:37,759 --> 00:02:34,079
and then the shuttle will execute to

61
00:02:39,559 --> 00:02:37,769
separation burns to basically leave the

62
00:02:41,690 --> 00:02:39,569
orbit of the International Space Station

63
00:02:44,119 --> 00:02:41,700

so that they can conduct the late

64
00:02:47,059 --> 00:02:44,129
inspection activities and also set up

65
00:02:50,539 --> 00:02:47,069
for the deploy of the Pico set payload

66
00:02:52,970 --> 00:02:50,549
on flight day 13 so this is really

67
00:02:55,659 --> 00:02:52,980
what's going to consume our time for

68
00:02:59,210 --> 00:02:55,669
tomorrow it should be an exciting

69
00:03:01,129 --> 00:02:59,220
exciting set of activities again

70
00:03:03,949 --> 00:03:01,139
bittersweet is all of these activities

71
00:03:05,990 --> 00:03:03,959
are but the team has been very focused

72
00:03:08,149 --> 00:03:06,000
they've been prepared we've gone over

73
00:03:10,220 --> 00:03:08,159
all of our rendezvous and undocking

74
00:03:12,289 --> 00:03:10,230
procedures gone over all of our

75
00:03:14,659 --> 00:03:12,299
checklists all of our rules and make

76
00:03:17,059 --> 00:03:14,669
sure that we understand what we need to

77
00:03:18,259 --> 00:03:17,069
do tomorrow so by my team is certainly

78
00:03:21,439 --> 00:03:18,269
looking forward to executing the

79
00:03:24,199 --> 00:03:21,449
undocking activities and that will

80
00:03:27,759 --> 00:03:24,209
really conclude my team's involvement in

81
00:03:31,490 --> 00:03:27,769
the mission after my shift tomorrow will

82
00:03:34,189 --> 00:03:31,500
commend the the crew and the mission to

83
00:03:36,789 --> 00:03:34,199
the care of the entry team led by mr.

84
00:03:40,009 --> 00:03:36,799
Toney's achachi and they'll conduct the

85
00:03:41,930 --> 00:03:40,019
the landing minus one day activities

86
00:03:43,879 --> 00:03:41,940
which include check out of the flight

87
00:03:45,490 --> 00:03:43,889
control system as well as other

88
00:03:48,619 --> 00:03:45,500

equipment that's required for landing

89
00:03:51,830 --> 00:03:48,629
cabin stow and other activities which

90
00:03:54,050 --> 00:03:51,840
which are standard and typical prior to

91
00:03:56,809 --> 00:03:54,060
prior to our expected d orbit and

92
00:03:58,369 --> 00:03:56,819
landing at Kennedy Space Center so

93
00:04:00,280 --> 00:03:58,379
that's summary of what we've got ahead

94
00:04:02,569 --> 00:04:00,290
of us and I'd be happy to take questions

95
00:04:04,039 --> 00:04:02,579
Thank You Kwazii we'll start with

96
00:04:05,719 --> 00:04:04,049
questions here in Houston please

97
00:04:07,520 --> 00:04:05,729
remember to step to the mic times here

98
00:04:08,990 --> 00:04:07,530
to ask your questions and please

99
00:04:14,450 --> 00:04:09,000
identify yourself by name and

100
00:04:20,070 --> 00:04:17,180
hi Robert Pearlman with collectspace.com

101
00:04:22,350 --> 00:04:20,080
with regards to tomorrows undocking and

102
00:04:24,300 --> 00:04:22,360
fly around given the different

103
00:04:27,030 --> 00:04:24,310
orientation that the station will be in

104
00:04:28,830 --> 00:04:27,040
what type of visuals should we expect

105
00:04:30,720 --> 00:04:28,840
the station to have of the shuttle

106
00:04:33,060 --> 00:04:30,730
because it'll be the last time that we

107
00:04:35,840 --> 00:04:33,070
get to see the shuttle in flight okay

108
00:04:38,340 --> 00:04:35,850
that's great question i think the the

109
00:04:41,900 --> 00:04:38,350
station will have very good line of

110
00:04:44,850 --> 00:04:41,910
sight to the shuttle as it as it

111
00:04:47,010 --> 00:04:44,860
performs his fly around from the cupola

112
00:04:49,920 --> 00:04:47,020
windows the cupola provides actually a

113
00:04:52,470 --> 00:04:49,930

number of different angles from which to

114
00:04:54,690 --> 00:04:52,480
view just about anything outside the

115
00:04:57,050 --> 00:04:54,700
spacecraft which we should also get

116
00:04:59,880 --> 00:04:57,060
pretty good photography from the station

117
00:05:02,970 --> 00:04:59,890
as the shuttle passes underneath the

118
00:05:06,140 --> 00:05:02,980
station from those those nadir sm

119
00:05:08,700 --> 00:05:06,150
windows as well as the as well as

120
00:05:10,470 --> 00:05:08,710
possibly the the lab window however i

121
00:05:12,450 --> 00:05:10,480
think the lab window will will end up

122
00:05:14,210 --> 00:05:12,460
being closed the lab window shutter will

123
00:05:16,920 --> 00:05:14,220
be closed due to contamination

124
00:05:19,080 --> 00:05:16,930
constraints associated with thruster

125
00:05:21,300 --> 00:05:19,090
operation so we should see some pretty

126
00:05:23,700 --> 00:05:21,310
good pretty good views from this space

127
00:05:25,200 --> 00:05:23,710
station the Space Shuttle we expect will

128
00:05:28,290 --> 00:05:25,210
take some really interesting views of

129
00:05:30,420 --> 00:05:28,300
the station again the station will be in

130
00:05:33,150 --> 00:05:30,430
an orientation that it has not been in

131
00:05:36,180 --> 00:05:33,160
before during the shuttle fly around so

132
00:05:37,409 --> 00:05:36,190
we expect to see portions of the

133
00:05:40,230 --> 00:05:37,419
spacecraft that we've never really

134
00:05:47,250 --> 00:05:40,240
gotten good direct high-resolution

135
00:05:49,740 --> 00:05:47,260
photography of in the past clara

136
00:05:52,110 --> 00:05:49,750
moskowitz with the space calm and I'm

137
00:05:53,760 --> 00:05:52,120
wondering if just how cramped is it

138
00:05:56,540 --> 00:05:53,770

really for the four astronauts on the

139
00:05:59,810 --> 00:05:56,550
flight deck after they close the hatch

140
00:06:02,730 --> 00:05:59,820
ok for the astronauts on the flight deck

141
00:06:05,610 --> 00:06:02,740
for this mission is no more cramped than

142
00:06:08,310 --> 00:06:05,620
it has been in the past actually the

143
00:06:11,210 --> 00:06:08,320
four astronauts fit fairly comfortably

144
00:06:14,790 --> 00:06:11,220
on the flight deck of course they they

145
00:06:17,400 --> 00:06:14,800
are in fairly close quarters but what's

146
00:06:20,190 --> 00:06:17,410
good about it is that with no crew

147
00:06:22,650 --> 00:06:20,200
members sort of resident on the mid-deck

148
00:06:26,100 --> 00:06:22,660
the aggregate amount of space that the

149
00:06:27,629 --> 00:06:26,110
crew has on the shuttle is better than

150
00:06:29,369 --> 00:06:27,639
what they're used to

151
00:06:32,339 --> 00:06:29,379
you know when when you have a crew of

152
00:06:34,230 --> 00:06:32,349
six or crew of seven on the shuttle

153
00:06:36,869 --> 00:06:34,240
without the additional volume of the

154
00:06:40,439 --> 00:06:36,879
International Space Station quarters are

155
00:06:42,719 --> 00:06:40,449
pretty close do we have additional

156
00:06:47,519 --> 00:06:42,729
questions here in Houston seeing none

157
00:06:49,980 --> 00:06:47,529
we'll go on to the phone bridge mark yes

158
00:06:53,279 --> 00:06:49,990
thank you mark Kerr oh poor aviation

159
00:06:56,219 --> 00:06:53,289
week I believe this is the first long

160
00:06:59,629 --> 00:06:56,229
axis Y round of the space station I'm

161
00:07:01,980 --> 00:06:59,639
wondering is there anything specific

162
00:07:04,140 --> 00:07:01,990
you're looking for in the photo

163
00:07:05,939 --> 00:07:04,150

documentation or do you want to just

164
00:07:08,879 --> 00:07:05,949
kind of get anything and everything you

165
00:07:10,740 --> 00:07:08,889
can with the photography we're really

166
00:07:12,830 --> 00:07:10,750
looking for anything and everything that

167
00:07:15,360 --> 00:07:12,840
we can we don't have any particular

168
00:07:18,300 --> 00:07:15,370
expectations of what we will see however

169
00:07:21,329 --> 00:07:18,310
the photographs that we expect to get

170
00:07:23,640 --> 00:07:21,339
will be used as all of the fly around

171
00:07:25,649 --> 00:07:23,650
photographs are used for engineering

172
00:07:27,629 --> 00:07:25,659
evaluation of the overall health of the

173
00:07:31,079 --> 00:07:27,639
skin of the spacecraft the big thing we

174
00:07:33,570 --> 00:07:31,089
look for is micrometeoroid norbit abri

175
00:07:36,839 --> 00:07:33,580
impacts which of course we expect to see

176
00:07:38,700 --> 00:07:36,849
and we have seen on various various

177
00:07:42,469 --> 00:07:38,710
surfaces of the spacecraft that's normal

178
00:07:45,329 --> 00:07:42,479
and expected and when we compare

179
00:07:47,219 --> 00:07:45,339
photographs of certain sections of the

180
00:07:49,829 --> 00:07:47,229
spacecraft from one flight to the other

181
00:07:54,240 --> 00:07:49,839
from year to year to year that helps

182
00:07:56,730 --> 00:07:54,250
give us a very clear picture of how the

183
00:07:59,579 --> 00:07:56,740
spacecraft is holding up in the orbital

184
00:08:02,459 --> 00:07:59,589
environment that it sees so getting

185
00:08:03,869 --> 00:08:02,469
these photos of the long axis and and of

186
00:08:06,360 --> 00:08:03,879
course we'll get some interesting photos

187
00:08:08,579 --> 00:08:06,370
of the truss but it's really the the

188
00:08:11,159 --> 00:08:08,589

off-axis photos of the main body of the

189
00:08:14,610 --> 00:08:11,169
space station the lab module the nodes

190
00:08:17,129 --> 00:08:14,620
the the Russian segment modules etc that

191
00:08:19,980 --> 00:08:17,139
will that will help us in our overall

192
00:08:22,279 --> 00:08:19,990
evaluation of the the health of the

193
00:08:27,029 --> 00:08:22,289
spacecraft in its orbital environment

194
00:08:28,889 --> 00:08:27,039
and if I might just follow up I guess

195
00:08:33,959 --> 00:08:28,899
you're essentially sort of just going

196
00:08:37,740 --> 00:08:33,969
over the top is there you couldn't do a

197
00:08:39,719 --> 00:08:37,750
complete lap I gather well it's

198
00:08:40,560 --> 00:08:39,729
physically possible to do a complete lap

199
00:08:43,290 --> 00:08:40,570
but

200
00:08:46,110 --> 00:08:43,300
chosen to do only a half lap because of

201
00:08:49,170 --> 00:08:46,120
timeline constraints as you can imagine

202
00:08:50,850 --> 00:08:49,180
we still managed to to pack this cruise

203
00:08:54,660 --> 00:08:50,860
timeline very full even though they're

204
00:08:57,540 --> 00:08:54,670
incredibly incredibly efficient so in

205
00:09:00,390 --> 00:08:57,550
order to save time we've chosen to to do

206
00:09:02,850 --> 00:09:00,400
a half lap constraint half lap fly

207
00:09:05,550 --> 00:09:02,860
around because the time that we that

208
00:09:07,620 --> 00:09:05,560
would be required with the additional

209
00:09:08,940 --> 00:09:07,630
time that we're committing to this yah

210
00:09:11,400 --> 00:09:08,950
maneuver because that's really what's

211
00:09:15,450 --> 00:09:11,410
what's what's causing the the fly around

212
00:09:17,760 --> 00:09:15,460
time to to be larger the additional time

213
00:09:19,890 --> 00:09:17,770

would put us over our constraints as far

214
00:09:23,550 --> 00:09:19,900
as crew scheduling for the day if we did

215
00:09:26,700 --> 00:09:23,560
a full lap thank you very much ok barsa

216
00:09:30,150 --> 00:09:26,710
done yes good morning can you hear me

217
00:09:32,880 --> 00:09:30,160
yes we hear you fine yes klutzy you know

218
00:09:36,030 --> 00:09:32,890
your your last shift is coming up and

219
00:09:37,410 --> 00:09:36,040
I'm wondering how it feels for you and

220
00:09:38,910 --> 00:09:37,420
your team if you should could just sort

221
00:09:41,690 --> 00:09:38,920
of talk a little bit about the emotion

222
00:09:44,400 --> 00:09:41,700
going into your last full shift and also

223
00:09:46,140 --> 00:09:44,410
what your plans are for landing whether

224
00:09:49,260 --> 00:09:46,150
you'll stay in Houston or come for the

225
00:09:52,830 --> 00:09:49,270
landing here at Kennedy ok both great

226
00:09:55,500 --> 00:09:52,840
questions as far as the emotions I

227
00:09:57,690 --> 00:09:55,510
certainly can't speak for my entire team

228
00:10:00,060 --> 00:09:57,700
just yet I've been trying to keep my

229
00:10:04,410 --> 00:10:00,070
finger on the pulse and we talk a lot I

230
00:10:09,630 --> 00:10:04,420
think it's fair to say that we

231
00:10:11,700 --> 00:10:09,640
experienced vacillations between intense

232
00:10:15,240 --> 00:10:11,710
pride and how well this mission is gone

233
00:10:16,800 --> 00:10:15,250
and and some sometimes being somewhat

234
00:10:22,050 --> 00:10:16,810
freaked out for lack of a more technical

235
00:10:25,050 --> 00:10:22,060
term it's the finality of of our service

236
00:10:28,740 --> 00:10:25,060
in this mission finality of the program

237
00:10:31,950 --> 00:10:28,750
it hits you with greater force the

238
00:10:34,350 --> 00:10:31,960

closer you get to the end the emotions I

239
00:10:37,080 --> 00:10:34,360
think feel a bit more intense today then

240
00:10:40,350 --> 00:10:37,090
then they felt back on flight day two or

241
00:10:43,560 --> 00:10:40,360
flight day three and I know it will be

242
00:10:45,060 --> 00:10:43,570
it'll feel very powerful tomorrow as we

243
00:10:48,740 --> 00:10:45,070
near the end of our shift after we've

244
00:10:53,590 --> 00:10:48,750
completed our separation burns

245
00:10:56,199 --> 00:10:53,600
personally I feel a great sense of honor

246
00:10:58,629 --> 00:10:56,209
and pride at being able to serve as a

247
00:11:01,960 --> 00:10:58,639
shuttle flight director it's been an

248
00:11:03,910 --> 00:11:01,970
extraordinary program there are a lot of

249
00:11:05,889 --> 00:11:03,920
people who would love to have had the

250
00:11:08,860 --> 00:11:05,899
opportunity to to be a flight director

251
00:11:10,870 --> 00:11:08,870
for for Space Shuttle let alone for the

252
00:11:14,470 --> 00:11:10,880
last shuttle mission I feel intense

253
00:11:16,990 --> 00:11:14,480
gratitude and I'm very humbled by it I

254
00:11:18,910 --> 00:11:17,000
feel an intense sense of pride at the

255
00:11:21,160 --> 00:11:18,920
accomplishments of my team my team have

256
00:11:23,439 --> 00:11:21,170
been absolutely fantastic I couldn't be

257
00:11:25,900 --> 00:11:23,449
more proud of them and in the midst of

258
00:11:27,970 --> 00:11:25,910
these emotions from time to time I had

259
00:11:30,040 --> 00:11:27,980
that thought of oh wow tomorrow is going

260
00:11:32,889 --> 00:11:30,050
to be my last shift as a space shuttle

261
00:11:34,990 --> 00:11:32,899
flight director I get kind of freaked

262
00:11:37,059 --> 00:11:35,000
out and had the sinking feeling in my

263
00:11:39,249 --> 00:11:37,069

stomach that lasts about you know five

264
00:11:41,680 --> 00:11:39,259
or ten seconds and then I go back to

265
00:11:43,930 --> 00:11:41,690
doing an impersonation of a steely-eyed

266
00:11:45,610 --> 00:11:43,940
missile man so that's kind of that's

267
00:11:47,590 --> 00:11:45,620
kind of kind of what what it's been like

268
00:11:49,540 --> 00:11:47,600
for me today and I imagine they'll be

269
00:11:52,780 --> 00:11:49,550
more the same tomorrow now to answer

270
00:11:54,970 --> 00:11:52,790
your question about landing made my

271
00:11:56,319 --> 00:11:54,980
final decisions i'm going to spend i'm

272
00:11:58,780 --> 00:11:56,329
going to observe the landing from

273
00:12:00,879 --> 00:11:58,790
Mission Control I won't be traveling to

274
00:12:03,100 --> 00:12:00,889
to Kennedy there'll be several several

275
00:12:06,490 --> 00:12:03,110
people of course doing that but I'm

276
00:12:07,840 --> 00:12:06,500
going to I'm going to to end my my

277
00:12:09,850 --> 00:12:07,850
career as a space shuttle flight

278
00:12:12,160 --> 00:12:09,860
director in mission control which i

279
00:12:14,110 --> 00:12:12,170
think is is entirely appropriate because

280
00:12:15,429 --> 00:12:14,120
that's of course how I've how I've lived

281
00:12:18,069 --> 00:12:15,439
not only my career as a flight director

282
00:12:20,800 --> 00:12:18,079
but since I've been working in Mission

283
00:12:24,660 --> 00:12:20,810
Control for the duration of the ISS

284
00:12:26,829 --> 00:12:24,670
program its home so that's where I'll be

285
00:12:33,910 --> 00:12:26,839
thank you very much for your eloquent

286
00:12:36,939 --> 00:12:33,920
answer yeah hike watch the two questions

287
00:12:38,290 --> 00:12:36,949
for me one in the fly around the way I

288
00:12:39,490 --> 00:12:38,300

should really look at this is to look

289
00:12:42,490 --> 00:12:39,500
angle that you're getting you're getting

290
00:12:44,530 --> 00:12:42,500
to look down the sides of the modules i

291
00:12:46,059 --> 00:12:44,540
guess and a better angle on the outboard

292
00:12:47,110 --> 00:12:46,069
into the trust more than resolution

293
00:12:48,639 --> 00:12:47,120
because it i don't see how the

294
00:12:50,800 --> 00:12:48,649
resolution is any different am i wrong

295
00:12:52,720 --> 00:12:50,810
or you're absolutely correct build the

296
00:12:53,740 --> 00:12:52,730
resolution is absolutely the same we're

297
00:12:56,230 --> 00:12:53,750
just shooting from a different angle

298
00:12:59,350 --> 00:12:56,240
that we haven't flown haven't flown

299
00:13:02,170 --> 00:12:59,360
before okay thanks in and to follow up

300
00:13:03,910 --> 00:13:02,180
on on marshes question a little bit what

301
00:13:05,530 --> 00:13:03,920
are you going to do after this program

302
00:13:06,930 --> 00:13:05,540
is if you decided whether to stay with

303
00:13:09,810 --> 00:13:06,940
the program are you going to maybe

304
00:13:11,850 --> 00:13:09,820
look look to something else well I

305
00:13:14,640 --> 00:13:11,860
always like to think that that i'm open

306
00:13:17,070 --> 00:13:14,650
to to all opportunities and we'll

307
00:13:21,450 --> 00:13:17,080
evaluate them as a flight controller

308
00:13:23,940 --> 00:13:21,460
would based on the data for for the next

309
00:13:27,000 --> 00:13:23,950
for the foreseeable future i'll

310
00:13:30,420 --> 00:13:27,010
certainly be looking at post flight

311
00:13:32,610 --> 00:13:30,430
reviews and closing out the the

312
00:13:35,010 --> 00:13:32,620
activities from this mission we actually

313
00:13:37,500 --> 00:13:35,020

always have a fair amount of work to do

314
00:13:40,020 --> 00:13:37,510
after each mission which include lessons

315
00:13:41,910 --> 00:13:40,030
learned reviews debriefs and things like

316
00:13:44,580 --> 00:13:41,920
that so i'll be i'll be fairly busy with

317
00:13:47,220 --> 00:13:44,590
with that stuff for for quite a few

318
00:13:48,930 --> 00:13:47,230
weeks hey quite do one last one for me

319
00:13:49,980 --> 00:13:48,940
i'm sorry i'll make it three questions

320
00:13:51,990 --> 00:13:49,990
real quick do you know how many people

321
00:13:55,860 --> 00:13:52,000
on your team or facing layoffs when this

322
00:13:59,450 --> 00:13:55,870
mission is over I don't have an exact

323
00:14:02,970 --> 00:13:59,460
number what I can share with you is that

324
00:14:04,620 --> 00:14:02,980
since the pre-flight press conferences

325
00:14:07,980 --> 00:14:04,630
that we did since the pre-flight

326
00:14:11,760 --> 00:14:07,990
briefings a few more members of my team

327
00:14:15,600 --> 00:14:11,770
have have either found or been selected

328
00:14:17,160 --> 00:14:15,610
for positions in either in the space

329
00:14:21,180 --> 00:14:17,170
station world or some of the other

330
00:14:22,890 --> 00:14:21,190
programs that we have have going a few

331
00:14:27,270 --> 00:14:22,900
more of them have found found employment

332
00:14:30,330 --> 00:14:27,280
outside so the overall disposition of my

333
00:14:33,090 --> 00:14:30,340
team is better now than it was about

334
00:14:34,590 --> 00:14:33,100
three weeks ago as far as specific

335
00:14:37,460 --> 00:14:34,600
numbers of people facing layoffs are

336
00:14:40,740 --> 00:14:37,470
still quite a significant number of them

337
00:14:43,470 --> 00:14:40,750
but you know we're grateful for for the

338
00:14:47,070 --> 00:14:43,480

the additional placements that folks

339
00:14:52,079 --> 00:14:47,080
have been able to achieve thanks for

340
00:14:55,740 --> 00:14:52,089
watching James Dean thanks a lot james

341
00:14:58,260 --> 00:14:55,750
dean with for today cuate i guess if i

342
00:15:01,140 --> 00:14:58,270
recall going in flight day 12 or

343
00:15:02,880 --> 00:15:01,150
tomorrow's flight day was expected to be

344
00:15:04,110 --> 00:15:02,890
one of the busiest is that don't think

345
00:15:08,070 --> 00:15:04,120
it might be the busiest day of the

346
00:15:10,710 --> 00:15:08,080
mission or with the crews success with

347
00:15:13,110 --> 00:15:10,720
the early earlier inspection you think

348
00:15:15,480 --> 00:15:13,120
things might not be as as tough as they

349
00:15:18,000 --> 00:15:15,490
were originally expecting to be well I

350
00:15:20,340 --> 00:15:18,010
think the the undocking day which of

351
00:15:20,889 --> 00:15:20,350
course now is on flight day 12 preflight

352
00:15:22,629 --> 00:15:20,899
it was on

353
00:15:25,119 --> 00:15:22,639
like the 11 undocking day will still be

354
00:15:28,689 --> 00:15:25,129
a very busy day they'll have a great

355
00:15:29,710 --> 00:15:28,699
deal of activities to do I fully expect

356
00:15:32,859 --> 00:15:29,720
that even though this crew has been

357
00:15:34,090 --> 00:15:32,869
fantastic they've got a bit less energy

358
00:15:36,249 --> 00:15:34,100
now than they did on flight they too

359
00:15:38,259 --> 00:15:36,259
they've been working really hard for the

360
00:15:40,299 --> 00:15:38,269
last several days so so I expect

361
00:15:41,889 --> 00:15:40,309
there'll be a little slower maybe a

362
00:15:43,900 --> 00:15:41,899
little bit more deliberate to keep from

363
00:15:46,389 --> 00:15:43,910

making mistakes the day that's going to

364
00:15:49,869 --> 00:15:46,399
be really packed that has absolutely no

365
00:15:52,389 --> 00:15:49,879
no margin for error is what is now

366
00:15:54,040 --> 00:15:52,399
flight day 13 but think of it as the the

367
00:15:57,540 --> 00:15:54,050
end of mission day minus one that's

368
00:16:00,939 --> 00:15:57,550
where we do the pecos at deploy and and

369
00:16:03,189 --> 00:16:00,949
the cabin stow and check out of the

370
00:16:05,379 --> 00:16:03,199
orbiters calm and flight control systems

371
00:16:08,290 --> 00:16:05,389
for deorbit landing that day in general

372
00:16:11,799 --> 00:16:08,300
tends to be fairly busy that's a day

373
00:16:13,600 --> 00:16:11,809
that we think will be challenging to get

374
00:16:15,699 --> 00:16:13,610
through with with the reduced number of

375
00:16:17,350 --> 00:16:15,709
crew because the number of activities

376
00:16:20,470 --> 00:16:17,360
that we have to do that they have not

377
00:16:22,960 --> 00:16:20,480
decreased with the crew size as is the

378
00:16:24,249 --> 00:16:22,970
case with some other days so that's the

379
00:16:28,269 --> 00:16:24,259
day that we think will be really packed

380
00:16:30,819 --> 00:16:28,279
for them okay thanks and I wonder if you

381
00:16:33,009 --> 00:16:30,829
could just update the system's a little

382
00:16:36,189 --> 00:16:33,019
bit I think from what I've read in the

383
00:16:38,530 --> 00:16:36,199
notes it said that there's 13 hours of

384
00:16:42,189 --> 00:16:38,540
the cryo margin is that like one day

385
00:16:45,970 --> 00:16:42,199
plus 13 hours and also just again the

386
00:16:49,119 --> 00:16:45,980
the computers i guess are all up and

387
00:16:51,519 --> 00:16:49,129
running as as they would have been all

388
00:16:55,629 --> 00:16:51,529

along all right be happy to talk about

389
00:16:58,509 --> 00:16:55,639
the the cryo margin first after we went

390
00:17:01,030 --> 00:16:58,519
ahead and added the additional day now

391
00:17:03,429 --> 00:17:01,040
when we launched the specification for

392
00:17:07,360 --> 00:17:03,439
our mission duration was essentially 12

393
00:17:10,000 --> 00:17:07,370
+ 2 12 being the nominal duration of the

394
00:17:12,059 --> 00:17:10,010
mission and plus 2 being sort of

395
00:17:15,579 --> 00:17:12,069
contingency reserve days that we reserve

396
00:17:17,470 --> 00:17:15,589
explicitly for intractable orbiter

397
00:17:20,380 --> 00:17:17,480
systems problems that would prevent us

398
00:17:23,590 --> 00:17:20,390
from safe reentry or for weather issues

399
00:17:27,010 --> 00:17:23,600
that that may prevent us from landing at

400
00:17:29,649 --> 00:17:27,020
Kennedy Space Center on time so so think

401
00:17:30,850 --> 00:17:29,659
of those 22 contingency days is

402
00:17:33,400 --> 00:17:30,860
something that we sort of keep in the

403
00:17:38,170 --> 00:17:33,410
bank for a rainy day if you will

404
00:17:40,690 --> 00:17:38,180
so above and beyond the 13 plus two

405
00:17:44,080 --> 00:17:40,700
because we gained enough margin to add

406
00:17:46,120 --> 00:17:44,090
an additional nominal day so the new

407
00:17:51,820 --> 00:17:46,130
specification for the mission is 13 plus

408
00:17:54,640 --> 00:17:51,830
2 we have about 12 to 14 hours of margin

409
00:17:58,420 --> 00:17:54,650
above that it's not nearly enough to to

410
00:18:00,720 --> 00:17:58,430
achieve yet another day on orbit but but

411
00:18:03,040 --> 00:18:00,730
that margin is useful in the event that

412
00:18:05,350 --> 00:18:03,050
weather absolutely doesn't cooperate

413
00:18:08,320 --> 00:18:05,360

with us in and we have intractably

414
00:18:11,470 --> 00:18:08,330
unsafe weather conditions at all of our

415
00:18:15,790 --> 00:18:11,480
landing sites and we may need to extend

416
00:18:18,460 --> 00:18:15,800
just the half a day in order to to get

417
00:18:22,390 --> 00:18:18,470
on a trajectory that puts us down safely

418
00:18:25,900 --> 00:18:22,400
somewhere in the world so it you know

419
00:18:28,870 --> 00:18:25,910
although that additional 13 14 hours is

420
00:18:31,810 --> 00:18:28,880
not really useful for mission content it

421
00:18:33,400 --> 00:18:31,820
can can make a difference to the entry

422
00:18:35,890 --> 00:18:33,410
team that's trying to find a place to

423
00:18:37,330 --> 00:18:35,900
put the orbiter down in the event that

424
00:18:39,430 --> 00:18:37,340
we have really bad weather our primary

425
00:18:42,330 --> 00:18:39,440
landing sites now as far as the

426
00:18:46,360 --> 00:18:42,340
computers all of the computers are in

427
00:18:51,160 --> 00:18:46,370
nominal configuration our efforts to to

428
00:18:53,050 --> 00:18:51,170
restart GPC for we're successful we

429
00:18:55,540 --> 00:18:53,060
transitioned systems management

430
00:18:58,450 --> 00:18:55,550
functions back to GPC for which is our

431
00:19:00,310 --> 00:18:58,460
nominal on-orbit configuration GPC to

432
00:19:02,230 --> 00:19:00,320
which had temporarily taken over systems

433
00:19:06,490 --> 00:19:02,240
management functions that computer is

434
00:19:09,820 --> 00:19:06,500
now asleep in its GNC mode and tomorrow

435
00:19:15,280 --> 00:19:09,830
for undocking we will bring up GPC too

436
00:19:17,890 --> 00:19:15,290
and GPC 3 to join GPC one as GNC

437
00:19:19,530 --> 00:19:17,900
computers in a redundant set so those

438
00:19:22,480 --> 00:19:19,540

three computers will be flying the ship

439
00:19:24,220 --> 00:19:22,490
while a GPC for will be performing its

440
00:19:26,950 --> 00:19:24,230
nominal systems management functions so

441
00:19:29,620 --> 00:19:26,960
nominal configuration now one thing I

442
00:19:32,470 --> 00:19:29,630
will note is that given that we did not

443
00:19:35,770 --> 00:19:32,480
find evidence of a software problem or

444
00:19:39,340 --> 00:19:35,780
software glitch that took down GPC for

445
00:19:41,290 --> 00:19:39,350
we have designated GPC for as what we

446
00:19:44,290 --> 00:19:41,300
call having experienced a hardware

447
00:19:46,210 --> 00:19:44,300
transient failure as a result our flight

448
00:19:48,909 --> 00:19:46,220
rules prohibit us from

449
00:19:51,310 --> 00:19:48,919
assigning one of the flight critical

450
00:19:53,260 --> 00:19:51,320
strings one through three to be

451
00:19:55,870 --> 00:19:53,270
controlled by GPC for we can either use

452
00:19:59,110 --> 00:19:55,880
GPC for as a systems management computer

453
00:20:00,970 --> 00:19:59,120
which is what it's doing right now or we

454
00:20:05,010 --> 00:20:00,980
can assign it to sort of our main data

455
00:20:07,480 --> 00:20:05,020
bus number four which has less critical

456
00:20:10,360 --> 00:20:07,490
equipment less flight critical equipment

457
00:20:11,860 --> 00:20:10,370
on it then strings one through three so

458
00:20:14,380 --> 00:20:11,870
we do have some restriction on how we

459
00:20:16,060 --> 00:20:14,390
can use GPC for but the good news is the

460
00:20:18,370 --> 00:20:16,070
nature of that restriction is such that

461
00:20:20,490 --> 00:20:18,380
we can still use it the way we nominally

462
00:20:23,409 --> 00:20:20,500
plan to use it it's just that we have

463
00:20:25,180 --> 00:20:23,419

one or two fewer options available to us

464
00:20:26,919 --> 00:20:25,190
in the event that we we have some

465
00:20:29,289 --> 00:20:26,929
permanent computer failures on any of

466
00:20:31,149 --> 00:20:29,299
the other any of the other four boxes so

467
00:20:34,750 --> 00:20:31,159
hopefully that it addresses your

468
00:20:37,000 --> 00:20:34,760
question yes thanks and just just one

469
00:20:38,860 --> 00:20:37,010
last one I know it's probably

470
00:20:41,080 --> 00:20:38,870
ridiculously early to ask you a weather

471
00:20:42,370 --> 00:20:41,090
question but there is a tropical storm I

472
00:20:43,630 --> 00:20:42,380
guess off the east coast of Florida I

473
00:20:44,980 --> 00:20:43,640
don't think it's expected to be a

474
00:20:47,320 --> 00:20:44,990
problem but can you just say if it's

475
00:20:50,140 --> 00:20:47,330
something that you know is being being

476
00:20:52,690 --> 00:20:50,150
washed in is if it's any concern it's

477
00:20:56,049 --> 00:20:52,700
certainly being watched tropical storms

478
00:20:57,880 --> 00:20:56,059
are always a concern it is still fairly

479
00:20:59,200 --> 00:20:57,890
early to know what the weather at the

480
00:21:01,899 --> 00:20:59,210
Cape is going to do preliminary

481
00:21:04,950 --> 00:21:01,909
indications are that it should be

482
00:21:07,029 --> 00:21:04,960
favorable but as we know from launch day

483
00:21:09,460 --> 00:21:07,039
you you never know what's going to

484
00:21:12,100 --> 00:21:09,470
happen until you show up show up on game

485
00:21:16,419 --> 00:21:12,110
day lace up your cleats and get ready to

486
00:21:22,510 --> 00:21:16,429
play okay do we have any follow-up

487
00:21:25,659 --> 00:21:22,520
questions here in Houston Gina choose

488
00:21:27,760 --> 00:21:25,669

sincerely ABC News remind me on this new

489
00:21:30,190 --> 00:21:27,770
fly around is that basically a shuttle

490
00:21:32,260 --> 00:21:30,200
maneuver or a station maneuver on

491
00:21:35,980 --> 00:21:32,270
departure and if it is a station

492
00:21:38,529 --> 00:21:35,990
maneuver what goes into that ok for the

493
00:21:40,750 --> 00:21:38,539
modified fly around the shuttle will do

494
00:21:44,620 --> 00:21:40,760
what it always does which is it will

495
00:21:47,919 --> 00:21:44,630
undock along the the v-bar or along the

496
00:21:51,760 --> 00:21:47,929
velocity vector and back out to 600 feet

497
00:21:55,389 --> 00:21:51,770
and then Pilate will execute a fly

498
00:21:58,419 --> 00:21:55,399
around of essentially sweeping through

499
00:21:59,490 --> 00:21:58,429
an arc of approximately 600 feet and

500
00:22:00,750 --> 00:21:59,500
radius

501
00:22:02,550 --> 00:22:00,760
maintaining that distance of separation

502
00:22:05,190 --> 00:22:02,560
between the shuttle and the station

503
00:22:06,840 --> 00:22:05,200
what's different this time is that when

504
00:22:10,950 --> 00:22:06,850
the shuttle backs out to 600 feet the

505
00:22:12,840 --> 00:22:10,960
station will turn what we call will

506
00:22:14,940 --> 00:22:12,850
perform a yaw maneuver which is just a

507
00:22:18,990 --> 00:22:14,950
simple turn to the left or right if you

508
00:22:22,170 --> 00:22:19,000
will by about 90 degrees what's involved

509
00:22:26,280 --> 00:22:22,180
with that is simply for the station to

510
00:22:30,600 --> 00:22:26,290
execute what we call a a maneuver cyclo

511
00:22:35,190 --> 00:22:30,610
Graham think of it as a a pre-programmed

512
00:22:38,790 --> 00:22:35,200
time lined maneuver that is executed by

513
00:22:40,230 --> 00:22:38,800

the Russian segment GNC computers that

514
00:22:42,210 --> 00:22:40,240
are in the service module those

515
00:22:45,230 --> 00:22:42,220
computers at this phase of flight

516
00:22:48,300 --> 00:22:45,240
actually physically fly the spacecraft

517
00:22:50,040 --> 00:22:48,310
they do it in tandem with the u.s. GNC

518
00:22:52,800 --> 00:22:50,050
computers on the US segment of the space

519
00:22:58,170 --> 00:22:52,810
station that that provide sensor data

520
00:23:00,450 --> 00:22:58,180
from GPS receivers rate gyros all kinds

521
00:23:02,520 --> 00:23:00,460
of other instrumentation which helps the

522
00:23:05,640 --> 00:23:02,530
spacecraft know what its current

523
00:23:07,860 --> 00:23:05,650
orientation is so between the u.s. GNC

524
00:23:11,700 --> 00:23:07,870
computers and the Russian GNC computers

525
00:23:13,770 --> 00:23:11,710
that work in tandem and the Russian GNC

526
00:23:17,760 --> 00:23:13,780
computers actually will engage the

527
00:23:21,690 --> 00:23:17,770
Russian thrusters to essentially turn

528
00:23:24,120 --> 00:23:21,700
the spacecraft by 90 degrees and hold it

529
00:23:25,800 --> 00:23:24,130
at that attitude while the shuttle

530
00:23:29,430 --> 00:23:25,810
performs its fly around once the shuttle

531
00:23:32,910 --> 00:23:29,440
separates and clears ISS airspace if you

532
00:23:36,390 --> 00:23:32,920
will those same computers will execute a

533
00:23:39,060 --> 00:23:36,400
pre-planned time maneuver to turn it

534
00:23:41,040 --> 00:23:39,070
back to its normal orientation and go

535
00:23:43,860 --> 00:23:41,050
back to its its standard torque

536
00:23:47,880 --> 00:23:43,870
equilibrium attitude where it flies

537
00:23:49,370 --> 00:23:47,890
routinely for for the duration ok and we

538
00:23:51,270 --> 00:23:49,380

have other questions here in Houston

539
00:23:53,850 --> 00:23:51,280
seeing none we'll conclude this

540
00:23:55,590 --> 00:23:53,860
breathing a quick reminder that you can

541
00:23:59,940 --> 00:23:55,600
follow shuttle and Space Station

542
00:24:01,590 --> 00:23:59,950
activities at WWDC gov quantity thank