1
00:00:04,470 --> 00:00:02,629
good morning everybody from the johnson

2
00:00:05,829 --> 00:00:04,480
space center in houston

3
00:00:07,110 --> 00:00:05,839
welcome to today's mission status

4
00:00:09,110 --> 00:00:07,120
briefing it's been a busy day for the

5
00:00:11,110 --> 00:00:09,120
spacex and nasa teams and here to give

6
00:00:13,350 --> 00:00:11,120
us an update on the flight of the dragon

7
00:00:15,110 --> 00:00:13,360
so far is holly writings who is the lead

8
00:00:18,150 --> 00:00:15,120
nasa flight director we're also joined

9
00:00:19,910 --> 00:00:18,160
by john coloras from the spacex facility

10
00:00:21,349 --> 00:00:19,920
there in hawthorne california so we'll

11
00:00:23,750 --> 00:00:21,359
get started with holly

12
00:00:25,990 --> 00:00:23,760
all right well good morning everyone

13
00:00:28,070 --> 00:00:26,000

today is a really great day to come and

14
00:00:30,390 --> 00:00:28,080
talk to you because it's been very very

15
00:00:32,709 --> 00:00:30,400
successful up to this point

16
00:00:34,229 --> 00:00:32,719
today we performed our first joint

17
00:00:37,190 --> 00:00:34,239
operations

18
00:00:39,270 --> 00:00:37,200
with the team at spacex in hawthorne

19
00:00:40,630 --> 00:00:39,280
california this is really something

20
00:00:42,950 --> 00:00:40,640
we've been

21
00:00:45,270 --> 00:00:42,960
training for for for many years and

22
00:00:46,470 --> 00:00:45,280
really looking forward to and we're

23
00:00:48,310 --> 00:00:46,480
excited that

24
00:00:49,270 --> 00:00:48,320
this first operation jointly with that

25
00:00:51,830 --> 00:00:49,280
team

26
00:00:54,790 --> 00:00:51,840
went as well as it did so we had a very

27
00:00:56,389 --> 00:00:54,800
successful fly under where dragon flew

28
00:00:58,150 --> 00:00:56,399
under the space station about two and a

29
00:01:00,470 --> 00:00:58,160
half kilometers

30
00:01:02,630 --> 00:01:00,480
below the space station again this was

31
00:01:05,509 --> 00:01:02,640
our first joint operation

32
00:01:07,510 --> 00:01:05,519
we had several activities that we wanted

33
00:01:08,469 --> 00:01:07,520
specifically to accomplish with this fly

34
00:01:11,109 --> 00:01:08,479
under

35
00:01:13,670 --> 00:01:11,119
one of those was communication between

36
00:01:16,789 --> 00:01:13,680
the dragon and the space station we were

37
00:01:18,630 --> 00:01:16,799
able to establish that successfully

38
00:01:21,590 --> 00:01:18,640

check out that link both from the crew

39
00:01:23,749 --> 00:01:21,600
on board and the ground teams and so

40
00:01:25,749 --> 00:01:23,759
that was very very positive

41
00:01:27,350 --> 00:01:25,759
one of the capabilities that we needed

42
00:01:29,910 --> 00:01:27,360
to perform the rendezvous and the

43
00:01:33,190 --> 00:01:29,920
capture tomorrow

44
00:01:35,510 --> 00:01:33,200
we also were able to kind of shake out

45
00:01:36,710 --> 00:01:35,520
our process of working together again i

46
00:01:39,350 --> 00:01:36,720
mentioned we'd been training and

47
00:01:41,109 --> 00:01:39,360
practicing that for many years but doing

48
00:01:43,990 --> 00:01:41,119
it for the the first time with two

49
00:01:45,350 --> 00:01:44,000
dynamic spacecraft uh flying uh very

50
00:01:47,749 --> 00:01:45,360
close together

51
00:01:49,670 --> 00:01:47,759
you always want to make sure that you're

52
00:01:51,910 --> 00:01:49,680
going to be able to to work as as you

53
00:01:54,630 --> 00:01:51,920
trained and i'll tell you that it went

54
00:01:57,510 --> 00:01:54,640
very very smoothly it felt exactly like

55
00:01:58,550 --> 00:01:57,520
our training the teams communicated

56
00:02:00,389 --> 00:01:58,560
about

57
00:02:01,830 --> 00:02:00,399
all of the activities that were

58
00:02:03,670 --> 00:02:01,840
performed today

59
00:02:05,670 --> 00:02:03,680
in a lot of detail and showed a lot of

60
00:02:07,109 --> 00:02:05,680
understanding and

61
00:02:09,190 --> 00:02:07,119
communication

62
00:02:11,350 --> 00:02:09,200
the other thing we did today certainly

63
00:02:12,869 --> 00:02:11,360

on the on the space station side we

64
00:02:15,670 --> 00:02:12,879
worked some with our crew as they

65
00:02:18,150 --> 00:02:15,680
prepared for the rendezvous and capture

66
00:02:20,150 --> 00:02:18,160
tomorrow those activities were some

67
00:02:21,670 --> 00:02:20,160
training activities uh

68
00:02:24,150 --> 00:02:21,680
doing a kind of a last run through with

69
00:02:26,390 --> 00:02:24,160
the ssrms the

70
00:02:27,510 --> 00:02:26,400
robotic arm that's in the position it

71
00:02:29,350 --> 00:02:27,520
will be

72
00:02:31,110 --> 00:02:29,360
that they used to capture the dragon

73
00:02:33,990 --> 00:02:31,120
tomorrow and so they were doing some

74
00:02:35,910 --> 00:02:34,000
final training runs with a robotic arm

75
00:02:36,869 --> 00:02:35,920
and they were actually also setting up

76
00:02:41,750 --> 00:02:36,879
their

77
00:02:44,390 --> 00:02:41,760
the crew command panel which again is

78
00:02:46,949 --> 00:02:44,400
how they uh communicate from a command

79
00:02:49,589 --> 00:02:46,959
standpoint with the dragon

80
00:02:52,630 --> 00:02:49,599
and we also were able to see the dragon

81
00:02:54,550 --> 00:02:52,640
as it flew under the crew reported to us

82
00:02:56,229 --> 00:02:54,560
a tally hoe with a dragon

83
00:02:57,430 --> 00:02:56,239
the dragon has a strobe light that was

84
00:02:59,030 --> 00:02:57,440
turned on and

85
00:03:00,949 --> 00:02:59,040
as the dragon passed below the space

86
00:03:02,790 --> 00:03:00,959
station we were the crew reported they

87
00:03:05,030 --> 00:03:02,800
were able to to see that light that

88
00:03:07,270 --> 00:03:05,040

strobe light and then our station

89
00:03:08,070 --> 00:03:07,280
cameras capture the dragon as well which

90
00:03:09,830 --> 00:03:08,080
is the

91
00:03:12,710 --> 00:03:09,840
picture that you're seeing on display

92
00:03:14,390 --> 00:03:12,720
here our downlink from our external

93
00:03:16,149 --> 00:03:14,400
station cameras

94
00:03:17,830 --> 00:03:16,159
so all of those things wrapped up into

95
00:03:19,750 --> 00:03:17,840
as i mentioned at the beginning a very

96
00:03:22,229 --> 00:03:19,760
successful day a great day

97
00:03:25,350 --> 00:03:22,239
in space and certainly from

98
00:03:27,589 --> 00:03:25,360
the nasa side we are excited about how

99
00:03:29,830 --> 00:03:27,599
the mission is going so far and so with

100
00:03:31,910 --> 00:03:29,840
that i'd like to hand it over to my

101
00:03:34,070 --> 00:03:31,920
colleague and my counterpart

102
00:03:36,949 --> 00:03:34,080
at spacex the dragon mission director

103
00:03:42,070 --> 00:03:39,110
good morning thanks holly yes it's a

104
00:03:44,869 --> 00:03:42,080
very exciting day for us at spacex

105
00:03:46,949 --> 00:03:44,879
as holly said we performed the flyby at

106
00:03:49,589 --> 00:03:46,959
two and a half kilometers below station

107
00:03:51,589 --> 00:03:49,599
uh all dragon systems checked out we

108
00:03:53,990 --> 00:03:51,599
look good we're currently uh past

109
00:03:56,309 --> 00:03:54,000
station now preparing to fly up and over

110
00:03:58,830 --> 00:03:56,319
station overnight and prepare for

111
00:04:01,589 --> 00:03:58,840
birthing uh dragons go for birthing day

112
00:04:06,949 --> 00:04:01,599
tomorrow and right now we're looking

113
00:04:10,550 --> 00:04:08,789

okay we'll take some questions starting

114
00:04:11,910 --> 00:04:10,560
here in houston first and then we'll go

115
00:04:13,270 --> 00:04:11,920
to the phone lines and since we have

116
00:04:14,390 --> 00:04:13,280
holly here and john out there in

117
00:04:16,229 --> 00:04:14,400
california

118
00:04:18,069 --> 00:04:16,239
we ask that you direct your question let

119
00:04:27,350 --> 00:04:18,079
us know who you're who you're asking it

120
00:04:32,390 --> 00:04:30,070
uh thank you mark caro for aviation week

121
00:04:35,110 --> 00:04:32,400
uh this is for holly riding

122
00:04:36,710 --> 00:04:35,120
um can you um

123
00:04:39,830 --> 00:04:36,720
sort of compare

124
00:04:42,230 --> 00:04:39,840
what unfolded today with with what you

125
00:04:44,310 --> 00:04:42,240
kind of expected or anticipated even

126
00:04:45,830 --> 00:04:44,320
with all of the training

127
00:04:48,150 --> 00:04:45,840
and

128
00:04:49,990 --> 00:04:48,160
though today was a success do you feel

129
00:04:51,909 --> 00:04:50,000
like you need to caution us that

130
00:04:54,150 --> 00:04:51,919
tomorrow is still pretty sporting or do

131
00:04:57,189 --> 00:04:54,160
you feel more confident based on what

132
00:04:58,310 --> 00:04:57,199
happened today okay so in terms of the

133
00:04:59,909 --> 00:04:58,320
training

134
00:05:01,990 --> 00:04:59,919
obviously the missions really got two

135
00:05:04,150 --> 00:05:02,000
large components this was the first one

136
00:05:06,870 --> 00:05:04,160
the fly under the second is

137
00:05:09,430 --> 00:05:06,880
the rendezvous capture birthing activity

138
00:05:11,909 --> 00:05:09,440

which will take place tomorrow we had

139
00:05:14,629 --> 00:05:11,919
practiced and trained both of those

140
00:05:16,710 --> 00:05:14,639
components and i'll tell you today went

141
00:05:20,550 --> 00:05:16,720
really very close to how we had trained

142
00:05:22,390 --> 00:05:20,560
it there was no major deviations from

143
00:05:25,350 --> 00:05:22,400
our pre-flight plan

144
00:05:27,590 --> 00:05:25,360
and really nothing that that we saw

145
00:05:28,629 --> 00:05:27,600
that we had not discussed at some point

146
00:05:30,790 --> 00:05:28,639
in time

147
00:05:31,990 --> 00:05:30,800
prior to the mission so

148
00:05:33,590 --> 00:05:32,000
when you

149
00:05:36,310 --> 00:05:33,600
perform operations with a real vehicle

150
00:05:37,270 --> 00:05:36,320
it's always a little bit

151
00:05:39,670 --> 00:05:37,280
more

152
00:05:41,909 --> 00:05:39,680
interesting in terms of you learn things

153
00:05:43,350 --> 00:05:41,919
you see the real data but all of the

154
00:05:44,469 --> 00:05:43,360
preflight planning our flight rules are

155
00:05:45,909 --> 00:05:44,479
procedures

156
00:05:47,909 --> 00:05:45,919
everything held up

157
00:05:50,070 --> 00:05:47,919
under under the scrutiny of of really

158
00:05:51,990 --> 00:05:50,080
flying in space with the dragon for the

159
00:05:53,029 --> 00:05:52,000
first time in terms of how i feel about

160
00:05:55,590 --> 00:05:53,039
tomorrow

161
00:05:59,189 --> 00:05:55,600
certainly this is a demonstration flight

162
00:06:01,510 --> 00:05:59,199
a test flight as as we've been saying

163
00:06:02,550 --> 00:06:01,520

and to get through this first piece of

164
00:06:09,029 --> 00:06:02,560
it

165
00:06:10,870 --> 00:06:09,039
tomorrow there's still a lot of really

166
00:06:13,510 --> 00:06:10,880
new things that

167
00:06:15,749 --> 00:06:13,520
the teams need to to perform and and the

168
00:06:17,350 --> 00:06:15,759
vehicles frankly need to perform and so

169
00:06:19,430 --> 00:06:17,360
although today was successful this is

170
00:06:22,950 --> 00:06:19,440
still definitely a demonstration a

171
00:06:26,710 --> 00:06:24,469
thank you very much i had a follow-up

172
00:06:29,110 --> 00:06:26,720
question uh during the activities today

173
00:06:31,909 --> 00:06:29,120
there were some difficulties on the

174
00:06:33,189 --> 00:06:31,919
station with um with the console

175
00:06:34,390 --> 00:06:33,199
monitors

176
00:06:36,950 --> 00:06:34,400
and

177
00:06:38,469 --> 00:06:36,960
i realize there's a backup

178
00:06:41,510 --> 00:06:38,479
in the lab i just wonder if there was

179
00:06:44,070 --> 00:06:41,520
any after action that's required

180
00:06:46,390 --> 00:06:44,080
today and overnight before

181
00:06:48,150 --> 00:06:46,400
you go forth tomorrow based on what

182
00:06:50,870 --> 00:06:48,160
happened today with the monitors or if

183
00:06:52,550 --> 00:06:50,880
they're all good to go now

184
00:06:53,749 --> 00:06:52,560
so the shorty answer is they're all back

185
00:06:55,749 --> 00:06:53,759
in the

186
00:06:57,029 --> 00:06:55,759
nominal configuration and ready for

187
00:06:58,710 --> 00:06:57,039
tomorrow

188
00:07:00,710 --> 00:06:58,720

specifically we had one of the monitors

189
00:07:01,510 --> 00:07:00,720
at the robotic workstation

190
00:07:05,749 --> 00:07:01,520
that

191
00:07:07,830 --> 00:07:05,759
so we had to go through a reboot process

192
00:07:09,749 --> 00:07:07,840
just like you'd reboot your laptop and

193
00:07:11,909 --> 00:07:09,759
so it comes back up the crew then did

194
00:07:14,870 --> 00:07:11,919
use that monitor for various activities

195
00:07:17,110 --> 00:07:14,880
and so we know it's functioning properly

196
00:07:19,670 --> 00:07:17,120
this again is is a standard thing we see

197
00:07:21,830 --> 00:07:19,680
with a lot of robotic activities they

198
00:07:23,990 --> 00:07:21,840
also were performing a calibration of

199
00:07:25,270 --> 00:07:24,000
some of our external cameras

200
00:07:28,150 --> 00:07:25,280
so that those

201
00:07:30,629 --> 00:07:28,160
cameras communicate with the information

202
00:07:33,510 --> 00:07:30,639
on those monitors very accurately

203
00:07:34,550 --> 00:07:33,520
tomorrow and so that process took a

204
00:07:38,629 --> 00:07:34,560
little bit

205
00:07:40,309 --> 00:07:38,639
because it's the first time we'd really

206
00:07:43,110 --> 00:07:40,319
done it for this specific vehicle we

207
00:07:43,830 --> 00:07:43,120
have done that calibration before

208
00:07:46,230 --> 00:07:43,840
for

209
00:07:47,110 --> 00:07:46,240
other visiting vehicle htv as an example

210
00:07:48,629 --> 00:07:47,120
so

211
00:07:50,710 --> 00:07:48,639
it's just been a while since we'd

212
00:07:52,230 --> 00:07:50,720
actually executed that activity but

213
00:07:54,390 --> 00:07:52,240

again we got through it we got the data

214
00:07:56,390 --> 00:07:54,400
we needed and everything is set up and

215
00:07:58,629 --> 00:07:56,400
ready to go for tomorrow

216
00:08:02,469 --> 00:07:58,639
phillip

217
00:08:04,550 --> 00:08:02,479
uh i just had a question about the the

218
00:08:05,990 --> 00:08:04,560
timing for today and then also for

219
00:08:08,390 --> 00:08:06,000
tomorrow um

220
00:08:10,629 --> 00:08:08,400
the the ha2 burn today was about an hour

221
00:08:12,150 --> 00:08:10,639
behind the uh i guess the timeline that

222
00:08:14,390 --> 00:08:12,160
we'd seen

223
00:08:16,869 --> 00:08:14,400
why was that and is that going to

224
00:08:19,029 --> 00:08:16,879
propagate out for tomorrow's rendezvous

225
00:08:20,790 --> 00:08:19,039
as well thanks okay so the answer is

226
00:08:22,309 --> 00:08:20,800
it's not going to propagate for

227
00:08:23,990 --> 00:08:22,319
tomorrow's rendezvous we expect the

228
00:08:25,670 --> 00:08:24,000
rendezvous to be on time for our

229
00:08:26,950 --> 00:08:25,680
pre-flight plan and then i think for the

230
00:08:30,629 --> 00:08:26,960
first part of your question i'll

231
00:08:35,509 --> 00:08:33,029
yes thank you so um that's correct we

232
00:08:37,509 --> 00:08:35,519
ran about uh 50 minutes from the nominal

233
00:08:39,829 --> 00:08:37,519
timeline from the launch once we

234
00:08:42,149 --> 00:08:39,839
inserted into orbit from falcon 9. we

235
00:08:44,470 --> 00:08:42,159
adjusted some burns in order to meet uh

236
00:08:47,350 --> 00:08:44,480
the height of just two burn time as

237
00:08:50,310 --> 00:08:47,360
close to zero 700 utc as possible in

238
00:08:51,910 --> 00:08:50,320

working with uh holly's team we decided

239
00:09:02,070 --> 00:08:51,920
zero

240
00:09:06,310 --> 00:09:04,150
yeah i'll follow it by saying you know

241
00:09:08,389 --> 00:09:06,320
again as as john said that was really a

242
00:09:09,910 --> 00:09:08,399
decision we made just with

243
00:09:11,990 --> 00:09:09,920
managing the mission you know we had a

244
00:09:14,310 --> 00:09:12,000
pre-flight prediction and then after the

245
00:09:16,870 --> 00:09:14,320
dragon gone on orbit and we were able to

246
00:09:19,910 --> 00:09:16,880
to watch how it was flying it made a

247
00:09:21,430 --> 00:09:19,920
little more sense to us to

248
00:09:23,030 --> 00:09:21,440
start a little bit later in the in the

249
00:09:25,670 --> 00:09:23,040
crew day and make make sure we had a lot

250
00:09:28,230 --> 00:09:25,680
of really solid time to involve them and

251
00:09:29,750 --> 00:09:28,240
so we had a discussion and like said

252
00:09:31,590 --> 00:09:29,760
targeted that a little bit later than

253
00:09:33,750 --> 00:09:31,600
we'd play in preflight

254
00:09:36,070 --> 00:09:33,760
as they fly around

255
00:09:38,230 --> 00:09:36,080
they will then target our pre-flight

256
00:09:40,070 --> 00:09:38,240
time tomorrow we don't have the luxury

257
00:09:41,829 --> 00:09:40,080
of starting a little bit later because

258
00:09:43,590 --> 00:09:41,839
it's a really long day for the crew and

259
00:09:45,670 --> 00:09:43,600
so we expect to be right back on our

260
00:09:48,829 --> 00:09:45,680
pre-flight plan tomorrow

261
00:09:52,310 --> 00:09:50,710
robert robert perlin with

262
00:09:54,389 --> 00:09:52,320
collectspace.com with a question for

263
00:09:56,310 --> 00:09:54,399

holly sort of working off of that if you

264
00:09:58,070 --> 00:09:56,320
do run into delays tomorrow is there a

265
00:09:59,910 --> 00:09:58,080
hard time where

266
00:10:02,230 --> 00:09:59,920
um you would you would either have to

267
00:10:05,030 --> 00:10:02,240
call an end to an attempt to a birthing

268
00:10:07,350 --> 00:10:05,040
or if you um or if you were grappled

269
00:10:09,190 --> 00:10:07,360
when you would have to uh call and say

270
00:10:11,750 --> 00:10:09,200
that it has to remain on the arm until

271
00:10:13,030 --> 00:10:11,760
the next day to be birthed

272
00:10:14,550 --> 00:10:13,040
yeah so

273
00:10:16,150 --> 00:10:14,560
yes the short answer is yes and and

274
00:10:19,030 --> 00:10:16,160
really the biggest consideration is

275
00:10:21,110 --> 00:10:19,040
you're kind of managing uh your crew

276
00:10:23,350 --> 00:10:21,120
timeline you know they are a resource

277
00:10:24,870 --> 00:10:23,360
and a consumable if you think about it

278
00:10:27,590 --> 00:10:24,880
we're they're going to be working very

279
00:10:30,790 --> 00:10:27,600
hard all day so if we were to have

280
00:10:33,110 --> 00:10:30,800
challenges as we did the rendezvous

281
00:10:34,870 --> 00:10:33,120
there is certainly the option to

282
00:10:36,310 --> 00:10:34,880
go ahead and put the dragon in what we

283
00:10:38,150 --> 00:10:36,320
call an overnight park position where it

284
00:10:40,069 --> 00:10:38,160
stays on the arm overnight you finish up

285
00:10:42,470 --> 00:10:40,079
the birthing that's an analyzed

286
00:10:45,190 --> 00:10:42,480
configuration it's a it's a pre-planned

287
00:10:47,190 --> 00:10:45,200
configuration certainly i know everybody

288
00:10:49,190 --> 00:10:47,200

would be much more excited if the dragon

289
00:10:50,790 --> 00:10:49,200
was birthed but if we need to do that

290
00:10:52,710 --> 00:10:50,800
that's something we've discussed we have

291
00:10:54,150 --> 00:10:52,720
all the procedures and

292
00:10:56,630 --> 00:10:54,160
it's similar to

293
00:10:58,069 --> 00:10:56,640
plans for the other visiting vehicles so

294
00:11:00,069 --> 00:10:58,079
if you're looking for a hard limit it's

295
00:11:01,590 --> 00:11:00,079
really based on on the crew day and and

296
00:11:03,269 --> 00:11:01,600
how much we need

297
00:11:05,750 --> 00:11:03,279
to work them so there's a fair amount of

298
00:11:07,910 --> 00:11:05,760
margin beyond the actual capture time on

299
00:11:09,590 --> 00:11:07,920
the order of several hours

300
00:11:11,190 --> 00:11:09,600
that we'll be able to

301
00:11:12,790 --> 00:11:11,200
go ahead and

302
00:11:14,150 --> 00:11:12,800
work with through any challenges and

303
00:11:15,829 --> 00:11:14,160
still have enough time to get growth

304
00:11:16,870 --> 00:11:15,839
tomorrow and then even after that we've

305
00:11:19,030 --> 00:11:16,880
got this

306
00:11:21,750 --> 00:11:19,040
pre-planned activity this overnight park

307
00:11:23,750 --> 00:11:21,760
which we could use if we needed to

308
00:11:25,590 --> 00:11:23,760
and just a quick follow-up on that if uh

309
00:11:27,190 --> 00:11:25,600
if it did come push to shove would that

310
00:11:29,110 --> 00:11:27,200
be something that since it's based on

311
00:11:30,710 --> 00:11:29,120
crew time that don pettit and the others

312
00:11:33,509 --> 00:11:30,720
could call down and say no we want to

313
00:11:34,710 --> 00:11:33,519

work into the night and you'd allow them

314
00:11:37,509 --> 00:11:34,720
so you're familiar with some of our

315
00:11:40,069 --> 00:11:37,519
crews and they love to work

316
00:11:42,710 --> 00:11:40,079
it's my job and and don's job working

317
00:11:44,230 --> 00:11:42,720
with me to to protect them because they

318
00:11:47,190 --> 00:11:44,240
are a resource so we don't want to burn

319
00:11:48,630 --> 00:11:47,200
them out in in one day i i fully expect

320
00:11:49,990 --> 00:11:48,640
them to call and say hey we'd like to

321
00:11:52,230 --> 00:11:50,000
keep going but

322
00:11:53,269 --> 00:11:52,240
it's our job as a joint team to to know

323
00:11:54,710 --> 00:11:53,279
when

324
00:11:56,069 --> 00:11:54,720
we've done as much work as we need to

325
00:11:58,310 --> 00:11:56,079
today and make the decision that we'll

326
00:12:01,509 --> 00:11:58,320
just go to the next day and and preserve

327
00:12:02,629 --> 00:12:01,519
uh really the the team as a resource to

328
00:12:04,230 --> 00:12:02,639
to make sure we can make the right

329
00:12:05,030 --> 00:12:04,240
decisions

330
00:12:06,790 --> 00:12:05,040
okay

331
00:12:09,110 --> 00:12:06,800
do you guys have any questions over here

332
00:12:12,230 --> 00:12:09,120
no okay let's go to the phone lines i

333
00:12:14,710 --> 00:12:12,240
believe that we have charles atkinson

334
00:12:16,790 --> 00:12:14,720
good morning charles examiner.com for

335
00:12:18,790 --> 00:12:16,800
john what is the current fuel level

336
00:12:23,590 --> 00:12:18,800
aboard dragon and how does it compare

337
00:12:29,190 --> 00:12:25,750
uh certainly so currently uh we are

338
00:12:31,910 --> 00:12:29,200

tracking abr above our pre-flight plan

339
00:12:33,670 --> 00:12:31,920
we're about 36 kilograms if you'd like

340
00:12:36,629 --> 00:12:33,680
an exact number above our pre-flight

341
00:12:39,350 --> 00:12:36,639
plan and we're looking very good um

342
00:12:40,790 --> 00:12:39,360
it's a fairly consistent profile to the

343
00:12:43,509 --> 00:12:40,800
plan now for the re-rendezvous and

344
00:12:46,550 --> 00:12:43,519
birthing so we should be good and uh

345
00:12:48,150 --> 00:12:46,560
this protects us if we need to extend or

346
00:12:49,829 --> 00:12:48,160
as holly said as a test flight if we

347
00:12:52,389 --> 00:12:49,839
need to take more time and come back

348
00:12:55,269 --> 00:12:52,399
around a second time

349
00:12:57,030 --> 00:12:55,279
okay and john uh one more unlike today

350
00:12:59,030 --> 00:12:57,040
will the cameras aboard dragon allow

351
00:13:02,870 --> 00:12:59,040
viewers here on the ground to view the

352
00:13:07,350 --> 00:13:05,110
so the cameras will be available we use

353
00:13:09,750 --> 00:13:07,360
them we need to be over a ground station

354
00:13:12,230 --> 00:13:09,760
when we receive video the cameras will

355
00:13:14,790 --> 00:13:12,240
be or rather the video system will be

356
00:13:17,670 --> 00:13:14,800
connected to our thermal imagers so we

357
00:13:21,829 --> 00:13:17,680
will have video of station but it will

358
00:13:23,509 --> 00:13:21,839
be in the ir spectrum infrared spectrum

359
00:13:25,829 --> 00:13:23,519
okay and will that be available on nasa

360
00:13:27,269 --> 00:13:25,839
tv

361
00:13:28,949 --> 00:13:27,279
we are feeding

362
00:13:31,590 --> 00:13:28,959
video to nasa and i'll be working with

363
00:13:33,829 --> 00:13:31,600

holly when that's available

364
00:13:36,389 --> 00:13:33,839
okay and holly my final one is is may

365
00:13:39,189 --> 00:13:36,399
31st the absolute final day dragon can

366
00:13:41,509 --> 00:13:39,199
stay docked to station

367
00:13:43,910 --> 00:13:41,519
well let's see may 31st is our nominally

368
00:13:46,949 --> 00:13:43,920
planned departure day

369
00:13:49,269 --> 00:13:46,959
the dragon has other

370
00:13:51,110 --> 00:13:49,279
landing opportunities uh re-entry and

371
00:13:53,110 --> 00:13:51,120
the orbit opportunities and john could

372
00:13:55,269 --> 00:13:53,120
tell you some of the specific dates

373
00:13:56,470 --> 00:13:55,279
beyond that uh for dragon on the space

374
00:13:57,670 --> 00:13:56,480
station side

375
00:14:00,790 --> 00:13:57,680
you know at the beginning of june we're

376
00:14:02,710 --> 00:14:00,800
headed into a high beta

377
00:14:05,430 --> 00:14:02,720
time period for about

378
00:14:07,990 --> 00:14:05,440
10 or so days and so we'd like to not do

379
00:14:09,590 --> 00:14:08,000
any dynamic vehicle activities uh you

380
00:14:12,069 --> 00:14:09,600
know dockings undockings birth things

381
00:14:14,790 --> 00:14:12,079
unbirthings in that time period so

382
00:14:17,750 --> 00:14:14,800
may 31st is nominal we've got a couple

383
00:14:19,670 --> 00:14:17,760
of days after that to work with and then

384
00:14:22,150 --> 00:14:19,680
the dragon if needed to could could stay

385
00:14:24,470 --> 00:14:22,160
even longer than that

386
00:14:32,150 --> 00:14:24,480
pretty much

387
00:14:36,310 --> 00:14:34,310
hi a question for john

388
00:14:39,030 --> 00:14:36,320

uh want to know a little bit more detail

389
00:14:40,790 --> 00:14:39,040
about the rehearsals and simulations uh

390
00:14:42,550 --> 00:14:40,800
beforehand

391
00:14:43,990 --> 00:14:42,560
if it's possible to get any kind of idea

392
00:14:45,430 --> 00:14:44,000
of you know how much time that you

393
00:14:46,790 --> 00:14:45,440
worked with nasa on some of these

394
00:14:49,350 --> 00:14:46,800
simulations

395
00:14:51,750 --> 00:14:49,360
um and then in particular

396
00:14:53,030 --> 00:14:51,760
were there any things uh in the

397
00:14:55,350 --> 00:14:53,040
simulation

398
00:14:57,430 --> 00:14:55,360
for this next stage tomorrow's uh part

399
00:14:58,790 --> 00:14:57,440
of the mission that were ever

400
00:15:00,310 --> 00:14:58,800
problematic and it's something that

401
00:15:02,069 --> 00:15:00,320
you're really looking forward to i get a

402
00:15:04,790 --> 00:15:02,079
point getting past beyond the actual

403
00:15:07,350 --> 00:15:04,800
birthing itself

404
00:15:09,269 --> 00:15:07,360
certainly i've been working with nasa on

405
00:15:11,269 --> 00:15:09,279
this mission specifically for a little

406
00:15:13,590 --> 00:15:11,279
over five years now

407
00:15:16,230 --> 00:15:13,600
we've been simulating for almost three

408
00:15:18,629 --> 00:15:16,240
years on various stages but really the

409
00:15:20,389 --> 00:15:18,639
main thrust of our simulations have been

410
00:15:23,030 --> 00:15:20,399
over the past year and a half we've

411
00:15:24,230 --> 00:15:23,040
conducted almost 20 joint simulations

412
00:15:26,949 --> 00:15:24,240
with nasa

413
00:15:29,189 --> 00:15:26,959

and over 40 simulations internally here

414
00:15:31,670 --> 00:15:29,199
to spacex among the four shifts of

415
00:15:33,910 --> 00:15:31,680
operators we have working so we've been

416
00:15:36,790 --> 00:15:33,920
working it very hard we

417
00:15:38,949 --> 00:15:36,800
fly by the mantra of train like you fly

418
00:15:41,110 --> 00:15:38,959
and then fly like you train and so far

419
00:15:43,110 --> 00:15:41,120
the mission has been proceeding uh just

420
00:15:45,350 --> 00:15:43,120
like a regular simulation so we're very

421
00:15:47,030 --> 00:15:45,360
pleased with that

422
00:15:49,350 --> 00:15:47,040
tomorrow as holly said it is a test

423
00:15:51,269 --> 00:15:49,360
flight so

424
00:15:52,949 --> 00:15:51,279
i don't want to jinx myself and say what

425
00:15:55,350 --> 00:15:52,959
i can expect and then see something

426
00:15:57,110 --> 00:15:55,360
different but uh right now the mission

427
00:15:59,829 --> 00:15:57,120
is looking just like our simulation so

428
00:16:01,910 --> 00:15:59,839
we're uh we're fortunate there and i'm

429
00:16:05,269 --> 00:16:01,920
not expecting anything uh that we

430
00:16:08,710 --> 00:16:07,269
were there anything in the simulation

431
00:16:10,389 --> 00:16:08,720
that uh

432
00:16:13,030 --> 00:16:10,399
you know that was sort of that hump that

433
00:16:15,030 --> 00:16:13,040
you had to get past or that hump that

434
00:16:17,030 --> 00:16:15,040
you know cause any issues that you're

435
00:16:19,030 --> 00:16:17,040
gonna take a breath once it's over

436
00:16:21,509 --> 00:16:19,040
tomorrow

437
00:16:23,189 --> 00:16:21,519
uh we use the simulations and as i said

438
00:16:26,389 --> 00:16:23,199

we've been simulating for a number of

439
00:16:28,710 --> 00:16:26,399
years we use them to iron out work uh on

440
00:16:30,069 --> 00:16:28,720
the hardware as well as in the operation

441
00:16:31,829 --> 00:16:30,079
so it's one of those nice things about

442
00:16:33,670 --> 00:16:31,839
spacex because of our development

443
00:16:35,829 --> 00:16:33,680
process and we're all under one roof

444
00:16:37,269 --> 00:16:35,839
here at hawthorne when we find something

445
00:16:38,949 --> 00:16:37,279
in a simulation we'd go back to the

446
00:16:41,269 --> 00:16:38,959
hardware people and talk to them about

447
00:16:43,670 --> 00:16:41,279
it and be able to iterate back and forth

448
00:16:45,030 --> 00:16:43,680
so i'm not expecting anything

449
00:16:46,949 --> 00:16:45,040
that

450
00:16:49,269 --> 00:16:46,959
the teams at least aren't prepared for

451
00:16:50,870 --> 00:16:49,279
we have a very cracked team

452
00:16:53,030 --> 00:16:50,880
there's always a chance of something

453
00:16:55,350 --> 00:16:53,040
that we haven't simulated coming up but

454
00:16:57,269 --> 00:16:55,360
we also have hardware in the loop here

455
00:16:59,590 --> 00:16:57,279
in hawthorne that we can run against

456
00:17:01,749 --> 00:16:59,600
before we do anything on the spacecraft

457
00:17:04,789 --> 00:17:01,759
so again i'm very confident and our

458
00:17:06,069 --> 00:17:04,799
simulation supervisors have been uh

459
00:17:08,470 --> 00:17:06,079
they've i think they've enjoyed

460
00:17:11,110 --> 00:17:08,480
torturing us with very unique scenarios

461
00:17:13,909 --> 00:17:11,120
so we're looking forward to uh birthing

462
00:17:15,829 --> 00:17:14,870
thank you

463
00:17:18,710 --> 00:17:15,839

okay

464
00:17:21,189 --> 00:17:18,720
let's go to marcia don associated press

465
00:17:22,549 --> 00:17:21,199
uh yes hi good morning i have a question

466
00:17:24,870 --> 00:17:22,559
for um

467
00:17:26,789 --> 00:17:24,880
john over at spacex what was the

468
00:17:28,789 --> 00:17:26,799
atmosphere the mood like when you

469
00:17:30,150 --> 00:17:28,799
completed the operation this morning

470
00:17:32,789 --> 00:17:30,160
with um

471
00:17:34,710 --> 00:17:32,799
with such finesse and i'm wondering

472
00:17:36,150 --> 00:17:34,720
what what kind of a

473
00:17:37,669 --> 00:17:36,160
kind of a mood does that put you in for

474
00:17:38,549 --> 00:17:37,679
tomorrow do you

475
00:17:40,310 --> 00:17:38,559
do

476
00:17:42,870 --> 00:17:40,320
or most of the nerves gone now that you

477
00:17:44,310 --> 00:17:42,880
did so well

478
00:17:46,549 --> 00:17:44,320
uh it definitely does help with the

479
00:17:48,870 --> 00:17:46,559
confidence again achieving the

480
00:17:50,870 --> 00:17:48,880
c2 mission objectives the original c2

481
00:17:53,669 --> 00:17:50,880
mission objectives today is a big

482
00:17:56,070 --> 00:17:53,679
confidence boost everyone's very excited

483
00:17:58,630 --> 00:17:56,080
i want to make sure everyone got to bed

484
00:18:00,549 --> 00:17:58,640
so they're well rested for tomorrow

485
00:18:03,510 --> 00:18:00,559
but it's exciting to be you know an

486
00:18:05,430 --> 00:18:03,520
american and part of the uh

487
00:18:09,990 --> 00:18:05,440
of putting american spacecraft into

488
00:18:17,029 --> 00:18:12,549

thank you very much

489
00:18:19,510 --> 00:18:17,039
all right uh clara with space.com

490
00:18:22,390 --> 00:18:19,520
yeah hi uh my question is for holly and

491
00:18:23,909 --> 00:18:22,400
i'm wondering when was the decision um

492
00:18:26,070 --> 00:18:23,919
to give the official go-ahead for

493
00:18:28,070 --> 00:18:26,080
birthing made and and what was the

494
00:18:31,029 --> 00:18:28,080
process of decision making there was it

495
00:18:33,510 --> 00:18:31,039
just a straightforward thing

496
00:18:35,029 --> 00:18:33,520
let's see so it's actually a series of

497
00:18:37,029 --> 00:18:35,039
decisions

498
00:18:38,070 --> 00:18:37,039
so when we talk about the fly under

499
00:18:40,150 --> 00:18:38,080
today

500
00:18:42,470 --> 00:18:40,160
we did sort of step one in that process

501
00:18:45,270 --> 00:18:42,480
so we did a go

502
00:18:47,430 --> 00:18:45,280
sort of an official poll both at the

503
00:18:49,510 --> 00:18:47,440
control center in hawthorne and the one

504
00:18:50,870 --> 00:18:49,520
here in houston uh

505
00:18:52,870 --> 00:18:50,880
in order to

506
00:18:54,710 --> 00:18:52,880
bring the dragon up to that two and a

507
00:18:57,270 --> 00:18:54,720
half kilometers below the space station

508
00:18:59,990 --> 00:18:57,280
for the fly under as dragon flies around

509
00:19:03,350 --> 00:19:00,000
the space station over about the next

510
00:19:05,029 --> 00:19:03,360
20 to 22 hours there's a series of those

511
00:19:07,190 --> 00:19:05,039
decision points and at each one of those

512
00:19:09,350 --> 00:19:07,200
you're checking really the health of

513
00:19:10,789 --> 00:19:09,360

both spacecrafts and make sure you're

514
00:19:13,350 --> 00:19:10,799
still in

515
00:19:15,110 --> 00:19:13,360
what you expected pre-flight in terms of

516
00:19:18,630 --> 00:19:15,120
your of your performance and your

517
00:19:19,669 --> 00:19:18,640
systems and so uh you do that overnight

518
00:19:21,750 --> 00:19:19,679
and then you'll start into your

519
00:19:23,669 --> 00:19:21,760
rendezvous sequence

520
00:19:25,750 --> 00:19:23,679
i think of it it basically starts at the

521
00:19:27,510 --> 00:19:25,760
point where we were we call that the ha2

522
00:19:29,110 --> 00:19:27,520
the height adjust to burn

523
00:19:31,909 --> 00:19:29,120
that's the burn where we started the fly

524
00:19:33,270 --> 00:19:31,919
under the day instead of

525
00:19:35,669 --> 00:19:33,280
going under at two and a half we'll

526
00:19:37,669 --> 00:19:35,679
continue on up towards the space station

527
00:19:39,430 --> 00:19:37,679
and and you can see each in the graphic

528
00:19:41,830 --> 00:19:39,440
that they just put up for me you can see

529
00:19:44,630 --> 00:19:41,840
each of the kind of brown maybe red

530
00:19:46,950 --> 00:19:44,640
colored dots is a is another height

531
00:19:48,789 --> 00:19:46,960
adjust maneuver so again you're turning

532
00:19:51,350 --> 00:19:48,799
on the dragon engines the the team in

533
00:19:52,950 --> 00:19:51,360
hawthorne is and and moving the dragon

534
00:19:54,950 --> 00:19:52,960
closer to the space station and each one

535
00:19:59,029 --> 00:19:54,960
of those points again has a as a pole

536
00:20:01,029 --> 00:19:59,039
has a a go in our uh nomenclature and

537
00:20:03,270 --> 00:20:01,039
and you're doing that at two and a half

538
00:20:05,909 --> 00:20:03,280

you're doing that at 1.4 we do that

539
00:20:08,630 --> 00:20:05,919
again several times after the dragon

540
00:20:10,789 --> 00:20:08,640
is again on the r bar which is uh kind

541
00:20:12,470 --> 00:20:10,799
of that space below

542
00:20:14,149 --> 00:20:12,480
the space station if you drew that

543
00:20:16,230 --> 00:20:14,159
direct line from the space station down

544
00:20:18,630 --> 00:20:16,240
to the the center of the earth and so

545
00:20:20,149 --> 00:20:18,640
the final go for birthing

546
00:20:22,870 --> 00:20:20,159
is actually very close to the space

547
00:20:25,510 --> 00:20:22,880
station so 10 meters we call that the

548
00:20:27,029 --> 00:20:25,520
capture point and so after you've

549
00:20:29,029 --> 00:20:27,039
crossed through all the gates leading up

550
00:20:29,909 --> 00:20:29,039
to that point with an increasing number

551
00:20:32,470 --> 00:20:29,919
of

552
00:20:34,870 --> 00:20:32,480
systems and that that you need to be

553
00:20:37,350 --> 00:20:34,880
working correctly then you give that

554
00:20:39,669 --> 00:20:37,360
final go again that's a joint uh pull

555
00:20:41,190 --> 00:20:39,679
between john's team and and my team here

556
00:20:42,789 --> 00:20:41,200
in houston and then after that you

557
00:20:44,870 --> 00:20:42,799
really turn it over to the crew you tell

558
00:20:47,590 --> 00:20:44,880
them you're go for capture they take

559
00:20:49,510 --> 00:20:47,600
both spacecrafts into a free drift again

560
00:20:51,669 --> 00:20:49,520
so that the thrusters do not fire on

561
00:20:53,830 --> 00:20:51,679
either spacecraft and reach out and

562
00:20:54,549 --> 00:20:53,840
capture dragon with the arm

563
00:20:57,430 --> 00:20:54,559

so

564
00:20:59,830 --> 00:20:57,440
when we talk about there having been a a

565
00:21:02,710 --> 00:20:59,840
go for birthing it's really again a

566
00:21:03,669 --> 00:21:02,720
series of activities the last one being

567
00:21:05,270 --> 00:21:03,679
right

568
00:21:07,270 --> 00:21:05,280
when dragon is is very close to the

569
00:21:10,950 --> 00:21:07,280
space station and that'll occur

570
00:21:12,950 --> 00:21:10,960
about 7 a.m central time tomorrow again

571
00:21:15,029 --> 00:21:12,960
roughly because we've got a lot of data

572
00:21:16,310 --> 00:21:15,039
to look at and activities to perform but

573
00:21:19,669 --> 00:21:16,320
that's the the rough time where that

574
00:21:20,549 --> 00:21:19,679
last go for birthing will occur

575
00:21:28,390 --> 00:21:20,559
thank you

576
00:21:33,510 --> 00:21:31,350
brownie there

577
00:21:36,070 --> 00:21:33,520
okay let's skip to brendan mcgeary with

578
00:21:40,950 --> 00:21:36,870
thanks

579
00:21:43,590 --> 00:21:40,960
parts here hopefully pretty brief though

580
00:21:45,190 --> 00:21:43,600
can you just summarize uh in brief what

581
00:21:47,430 --> 00:21:45,200
what happened this morning clearly the

582
00:21:48,630 --> 00:21:47,440
fly under is is sort of a milestone but

583
00:21:51,350 --> 00:21:48,640
you know to mention the strobe light

584
00:21:53,029 --> 00:21:51,360
there just a few more just highlights on

585
00:21:55,590 --> 00:21:53,039
on what exactly you guys accomplished

586
00:21:56,549 --> 00:21:55,600
this morning um uh

587
00:21:59,510 --> 00:21:56,559
two

588
00:22:01,909 --> 00:21:59,520

where things uh uh you know

589
00:22:03,909 --> 00:22:01,919
will are going uh i guess throughout the

590
00:22:05,590 --> 00:22:03,919
day you mentioned the sounds like the

591
00:22:07,510 --> 00:22:05,600
you know the race pack the circling is

592
00:22:09,830 --> 00:22:07,520
is now what's underway and then three

593
00:22:13,270 --> 00:22:09,840
just confirm for me the the scheduled

594
00:22:15,190 --> 00:22:13,280
birthing time for tomorrow

595
00:22:16,950 --> 00:22:15,200
okay well let's see the first part i

596
00:22:18,789 --> 00:22:16,960
actually was going to ask john if he

597
00:22:20,710 --> 00:22:18,799
wanted from his perspective to to give

598
00:22:21,909 --> 00:22:20,720
you the highlights of of the fly under

599
00:22:23,590 --> 00:22:21,919
since it was

600
00:22:26,710 --> 00:22:23,600
his his spacecraft we were seeing for

601
00:22:29,990 --> 00:22:26,720
the first time

602
00:22:31,909 --> 00:22:30,000
certainly so uh right before the flyby

603
00:22:33,669 --> 00:22:31,919
uh yesterday yesterday and the day

604
00:22:35,350 --> 00:22:33,679
before we performed some spacecraft

605
00:22:36,630 --> 00:22:35,360
checkouts which included an abort

606
00:22:41,909 --> 00:22:36,640
demonstration

607
00:22:44,390 --> 00:22:41,919
navigating off gps by itself and then a

608
00:22:46,390 --> 00:22:44,400
free drift demonstration and free drift

609
00:22:47,990 --> 00:22:46,400
is where we shut down all the thrusters

610
00:22:49,990 --> 00:22:48,000
and we do that at that 10 meter point

611
00:22:52,310 --> 00:22:50,000
that holly just mentioned prior to being

612
00:22:53,990 --> 00:22:52,320
grappled by the arm so we demonstrated

613
00:22:54,870 --> 00:22:54,000

all those and we're ready for flyby

614
00:22:59,590 --> 00:22:54,880
today

615
00:23:02,310 --> 00:22:59,600
were to prove first our katz uhf

616
00:23:05,430 --> 00:23:02,320
communications unit also known as cuckoo

617
00:23:08,390 --> 00:23:05,440
was able to close a link out to dragon

618
00:23:10,230 --> 00:23:08,400
cuckoo allows us to communicate between

619
00:23:12,710 --> 00:23:10,240
iss and dragon

620
00:23:14,950 --> 00:23:12,720
at very close ranges uh rough we're

621
00:23:17,430 --> 00:23:14,960
expecting roughly between 23 and 28

622
00:23:19,270 --> 00:23:17,440
kilometers we're very fortunate today we

623
00:23:22,149 --> 00:23:19,280
exceeded those uh

624
00:23:24,549 --> 00:23:22,159
going i'd say in excess of 90 kilometers

625
00:23:26,310 --> 00:23:24,559
so again very fortunate uh when you

626
00:23:28,549 --> 00:23:26,320
asked what were one of those points in

627
00:23:30,230 --> 00:23:28,559
the mission i'm kind of holding on to it

628
00:23:30,950 --> 00:23:30,240
was that and that was a great thing for

629
00:23:33,830 --> 00:23:30,960
us

630
00:23:36,070 --> 00:23:33,840
so uh cuckoo unit allows the crew to

631
00:23:37,990 --> 00:23:36,080
command dragon and we proved that that

632
00:23:40,789 --> 00:23:38,000
link works and it also allows dragon to

633
00:23:43,430 --> 00:23:40,799
know exactly where iss is by using iss's

634
00:23:45,909 --> 00:23:43,440
gps state so as we came in we performed

635
00:23:48,310 --> 00:23:45,919
the height adjust and colliptic 2 burns

636
00:23:50,390 --> 00:23:48,320
and we flew under station

637
00:23:53,350 --> 00:23:50,400
performed some cuckoo operations

638
00:23:56,310 --> 00:23:53,360

and then uh once we confirm gps is

639
00:23:57,830 --> 00:23:56,320
working the crew sent the crew

640
00:24:00,310 --> 00:23:57,840
from the crew command panel which is a

641
00:24:02,149 --> 00:24:00,320
panel connected to cuckoo the strobe on

642
00:24:04,470 --> 00:24:02,159
command and that was really to test that

643
00:24:06,310 --> 00:24:04,480
the crew can send a command to dragon

644
00:24:08,470 --> 00:24:06,320
and something that was benign

645
00:24:11,190 --> 00:24:08,480
and we saw that the strobes were indeed

646
00:24:13,510 --> 00:24:11,200
on and then we continued operations and

647
00:24:15,669 --> 00:24:13,520
then the crew through the same panel uh

648
00:24:18,310 --> 00:24:15,679
selected the strobes off so we have

649
00:24:20,149 --> 00:24:18,320
proven that the that both dragon can

650
00:24:22,390 --> 00:24:20,159
already navigate within close proximity

651
00:24:25,029 --> 00:24:22,400
of station and that the crew can command

652
00:24:28,710 --> 00:24:25,039
uh dragon so two very important mission

653
00:24:31,830 --> 00:24:30,310
let's see so i'll pick up with the rest

654
00:24:34,549 --> 00:24:31,840
of your question and add just a few

655
00:24:36,230 --> 00:24:34,559
points so on the space station side

656
00:24:39,110 --> 00:24:36,240
in order to do the the communication

657
00:24:40,470 --> 00:24:39,120
with dragon the uhf communication

658
00:24:43,350 --> 00:24:40,480
we put the space station in a very

659
00:24:44,870 --> 00:24:43,360
specific attitude which requires us to

660
00:24:46,549 --> 00:24:44,880
make sure our solar arrays are

661
00:24:48,230 --> 00:24:46,559
configured properly so the type of

662
00:24:50,310 --> 00:24:48,240
things we do for

663
00:24:52,310 --> 00:24:50,320

other visiting vehicles we also perform

664
00:24:54,630 --> 00:24:52,320
for dragon and there's a

665
00:24:55,830 --> 00:24:54,640
box on the space station uh the cuckoo

666
00:24:58,710 --> 00:24:55,840
box

667
00:25:01,110 --> 00:24:58,720
spacex built and flew up that

668
00:25:03,590 --> 00:25:01,120
communicates with its partner box on the

669
00:25:05,830 --> 00:25:03,600
dragon and so we made sure that was

670
00:25:06,789 --> 00:25:05,840
working correctly on the space station

671
00:25:08,789 --> 00:25:06,799
side

672
00:25:10,789 --> 00:25:08,799
john mentioned that we we gathered some

673
00:25:13,350 --> 00:25:10,799
relative navigation data

674
00:25:14,710 --> 00:25:13,360
so it's very important for us tomorrow

675
00:25:17,430 --> 00:25:14,720
to make sure that that relative

676
00:25:19,029 --> 00:25:17,440
navigation we call our gps data is

677
00:25:21,590 --> 00:25:19,039
accurate we did not use it for

678
00:25:23,990 --> 00:25:21,600
navigating today as we flew under but we

679
00:25:26,470 --> 00:25:24,000
gathered data and there's a team of of

680
00:25:28,470 --> 00:25:26,480
experts at nasa and spacex actually as

681
00:25:31,029 --> 00:25:28,480
we speak pouring through that data to

682
00:25:33,430 --> 00:25:31,039
make sure it's all working correctly

683
00:25:35,350 --> 00:25:33,440
for when we need it tomorrow as we

684
00:25:37,590 --> 00:25:35,360
approach closer into the space station

685
00:25:39,669 --> 00:25:37,600
and so that's a component that's very

686
00:25:41,190 --> 00:25:39,679
important to us that we go through that

687
00:25:43,510 --> 00:25:41,200
thorough review

688
00:25:46,230 --> 00:25:43,520

and understand that tomorrow when we do

689
00:25:48,390 --> 00:25:46,240
use that capability that the navigation

690
00:25:50,630 --> 00:25:48,400
will work correctly

691
00:25:52,710 --> 00:25:50,640
i'd see you asked to what else was going

692
00:25:53,990 --> 00:25:52,720
on today so one thing was the data

693
00:25:56,070 --> 00:25:54,000
review

694
00:25:57,750 --> 00:25:56,080
the dragon will perform a series of

695
00:26:00,230 --> 00:25:57,760
burns as it goes around the space

696
00:26:02,710 --> 00:26:00,240
station so that the joint operations

697
00:26:04,630 --> 00:26:02,720
between the control team operations team

698
00:26:07,190 --> 00:26:04,640
here and in hawthorne

699
00:26:09,110 --> 00:26:07,200
again continues uh all

700
00:26:11,029 --> 00:26:09,120
on the next two shifts before we report

701
00:26:12,390 --> 00:26:11,039
back for duty

702
00:26:14,390 --> 00:26:12,400
tomorrow

703
00:26:16,310 --> 00:26:14,400
again just making sure that the dragon

704
00:26:18,230 --> 00:26:16,320
can end up in exactly the right place to

705
00:26:19,510 --> 00:26:18,240
start the rendezvous

706
00:26:20,630 --> 00:26:19,520
tomorrow

707
00:26:22,310 --> 00:26:20,640
the crew

708
00:26:25,430 --> 00:26:22,320
for the rest of the day today will be

709
00:26:27,590 --> 00:26:25,440
continuing on with their preparation

710
00:26:29,990 --> 00:26:27,600
they've got some conferences

711
00:26:31,990 --> 00:26:30,000
to understand and get ready for the

712
00:26:32,710 --> 00:26:32,000
dragon cargo operations which of course

713
00:26:39,510 --> 00:26:32,720

is

714
00:26:41,830 --> 00:26:39,520
to bring up and and show that

715
00:26:43,510 --> 00:26:41,840
the crew can transfer cargo in and out

716
00:26:45,750 --> 00:26:43,520
of dragon and so they'll be doing some

717
00:26:47,909 --> 00:26:45,760
preparation for that activity

718
00:26:50,310 --> 00:26:47,919
those activities later in the week and

719
00:26:52,470 --> 00:26:50,320
into next week for the rest of their day

720
00:26:53,909 --> 00:26:52,480
on orbit today and i think your final

721
00:26:55,590 --> 00:26:53,919
question was

722
00:26:56,789 --> 00:26:55,600
birthing time so i mentioned earlier

723
00:26:58,950 --> 00:26:56,799
capture was

724
00:27:00,870 --> 00:26:58,960
you know going to be roughly 700 and i'm

725
00:27:03,750 --> 00:27:00,880
doing it in central daylight time

726
00:27:05,909 --> 00:27:03,760
birthing is 10 30 it's

727
00:27:07,909 --> 00:27:05,919
right about 10 30 central time is where

728
00:27:10,549 --> 00:27:07,919
it's timeline and of course it can move

729
00:27:12,950 --> 00:27:10,559
a little bit earlier later depending on

730
00:27:14,549 --> 00:27:12,960
how much time we need to evaluate the

731
00:27:16,789 --> 00:27:14,559
spacecraft as it

732
00:27:19,669 --> 00:27:16,799
sits below station in that our bar

733
00:27:21,909 --> 00:27:19,679
location but 10 30 is a rough nominal

734
00:27:26,230 --> 00:27:22,789
thank you

735
00:27:28,710 --> 00:27:26,240
all right irene klotz with reuters

736
00:27:30,549 --> 00:27:28,720
thanks josh um i had a couple questions

737
00:27:32,950 --> 00:27:30,559
for john first of all would you is your

738
00:27:36,070 --> 00:27:32,960

title also a flight director or what do

739
00:27:37,430 --> 00:27:36,080
you uh what's the spacex on designation

740
00:27:38,789 --> 00:27:37,440
for for you

741
00:27:41,190 --> 00:27:38,799
and um also

742
00:27:43,830 --> 00:27:41,200
was there anything in the test today

743
00:27:48,070 --> 00:27:43,840
that um you're going to use to tweak

744
00:27:52,230 --> 00:27:50,549
certainly so uh first at spacex we use

745
00:27:54,230 --> 00:27:52,240
the term mission director and i'm the

746
00:27:56,230 --> 00:27:54,240
lead mission director for the dragon c2

747
00:27:58,070 --> 00:27:56,240
plus mission uh we use the term mission

748
00:27:59,909 --> 00:27:58,080
director just to distinguish between

749
00:28:02,230 --> 00:27:59,919
mission and flight director calls while

750
00:28:03,590 --> 00:28:02,240
we're on communications with them with

751
00:28:05,029 --> 00:28:03,600
nasa

752
00:28:06,310 --> 00:28:05,039
secondly

753
00:28:08,230 --> 00:28:06,320
there's nothing that we would

754
00:28:10,549 --> 00:28:08,240
necessarily tweak

755
00:28:12,870 --> 00:28:10,559
one thing because cuckoo closed so far

756
00:28:14,870 --> 00:28:12,880
out i'm feeling very confident that some

757
00:28:17,110 --> 00:28:14,880
of our contingency procedures that we

758
00:28:20,070 --> 00:28:17,120
were looking to do were to getting

759
00:28:22,070 --> 00:28:20,080
closer will not be necessary so dragon

760
00:28:23,750 --> 00:28:22,080
looks good and uh we don't expect any

761
00:28:25,269 --> 00:28:23,760
tweaking

762
00:28:27,750 --> 00:28:25,279
thanks and the other question i had is

763
00:28:29,909 --> 00:28:27,760

just kind of a technical curiosity about

764
00:28:31,909 --> 00:28:29,919
why you use a

765
00:28:34,630 --> 00:28:31,919
video system connected to a thermal

766
00:28:37,510 --> 00:28:34,640
imager and what that gives you beyond

767
00:28:39,190 --> 00:28:37,520
optical spectrum thank you

768
00:28:41,350 --> 00:28:39,200
oh certainly so we actually have a

769
00:28:43,510 --> 00:28:41,360
number of video cameras on dragon as

770
00:28:45,430 --> 00:28:43,520
well as two thermal imagers

771
00:28:47,190 --> 00:28:45,440
we have two video cameras that point out

772
00:28:49,110 --> 00:28:47,200
at each solar array we use that to check

773
00:28:51,269 --> 00:28:49,120
out the arrays as well as get some

774
00:28:53,029 --> 00:28:51,279
pretty stunning views of the earth i

775
00:28:55,430 --> 00:28:53,039
believe we'll be posting those and we

776
00:28:57,269 --> 00:28:55,440
have a third camera that's inside the

777
00:28:59,830 --> 00:28:57,279
capsule itself so when the crew

778
00:29:01,990 --> 00:28:59,840
ingresses dragon they'll will be able to

779
00:29:03,669 --> 00:29:02,000
get some pretty good video of that the

780
00:29:05,909 --> 00:29:03,679
two thermal imagers are part of our

781
00:29:08,149 --> 00:29:05,919
proximity system so we use the thermal

782
00:29:10,789 --> 00:29:08,159
imagers in coordination with our two

783
00:29:11,669 --> 00:29:10,799
lidars to give us exact range and range

784
00:29:13,269 --> 00:29:11,679
rates

785
00:29:15,190 --> 00:29:13,279
to the international space station as

786
00:29:16,870 --> 00:29:15,200
we're approaching from the r bar as

787
00:29:18,470 --> 00:29:16,880
hollywood mentioned because they're

788
00:29:20,950 --> 00:29:18,480

thermal imagers we're able to hook them

789
00:29:22,389 --> 00:29:20,960
up via video switch to also get video

790
00:29:23,269 --> 00:29:22,399
from them so it's kind of a bonus

791
00:29:25,590 --> 00:29:23,279
there's

792
00:29:31,590 --> 00:29:25,600
no technical reason why we need infrared

793
00:29:36,710 --> 00:29:33,430
okay i guess that's it for marine uh

794
00:29:41,190 --> 00:29:39,190
all right thanks very much

795
00:29:43,269 --> 00:29:41,200
john a couple questions i think we we've

796
00:29:44,950 --> 00:29:43,279
seen obviously a number of vehicles come

797
00:29:46,549 --> 00:29:44,960
and go from the station could you just

798
00:29:48,630 --> 00:29:46,559
remind us why

799
00:29:50,389 --> 00:29:48,640
from from your perspective if you're

800
00:29:54,310 --> 00:29:50,399
able to birth it would be such a big

801
00:29:56,549 --> 00:29:54,320
deal and such a historic event

802
00:29:58,710 --> 00:29:56,559
uh certainly there are a number of uh

803
00:30:01,269 --> 00:29:58,720
unique items of dragon that uh other

804
00:30:04,070 --> 00:30:01,279
vehicles uh don't have the the biggest

805
00:30:06,310 --> 00:30:04,080
one being our ability to re return large

806
00:30:08,710 --> 00:30:06,320
amounts of cargo from orbit with the

807
00:30:10,549 --> 00:30:08,720
retirement of the shuttle uh now there's

808
00:30:12,870 --> 00:30:10,559
only one other vehicle the soyuz the

809
00:30:14,389 --> 00:30:12,880
crew carrying soyuz that can return

810
00:30:16,389 --> 00:30:14,399
uh mainly crew members and a small

811
00:30:17,990 --> 00:30:16,399
amount of cargo back to earth so dragon

812
00:30:20,549 --> 00:30:18,000
has a very significant amount of cargo

813
00:30:22,870 --> 00:30:20,559

it can bring back uh furthermore we're

814
00:30:24,310 --> 00:30:22,880
after this mission we're on contract for

815
00:30:26,389 --> 00:30:24,320
at least 12 more missions to the

816
00:30:29,830 --> 00:30:26,399
international space station and so we're

817
00:30:31,110 --> 00:30:29,840
looking to uh provide regular services

818
00:30:32,630 --> 00:30:31,120
uh again

819
00:30:38,230 --> 00:30:32,640
kind of at a faster rate than some of

820
00:30:43,350 --> 00:30:41,110
thanks and is it is it fair to say that

821
00:30:44,710 --> 00:30:43,360
your activity tomorrow is

822
00:30:46,389 --> 00:30:44,720
much more difficult than what you went

823
00:30:48,389 --> 00:30:46,399
through today obviously understanding

824
00:30:51,110 --> 00:30:48,399
that you had to get through this these

825
00:30:53,909 --> 00:30:51,120
steps first but i mean looking to to

826
00:30:55,669 --> 00:30:53,919
what's next is is the dragon maneuvers

827
00:30:57,029 --> 00:30:55,679
are they do they require much more

828
00:30:59,590 --> 00:30:57,039
precision and

829
00:31:00,950 --> 00:30:59,600
are they more challenging to the uh

830
00:31:02,310 --> 00:31:00,960
the software systems that you spend so

831
00:31:04,470 --> 00:31:02,320
much time working on or could you sort

832
00:31:06,549 --> 00:31:04,480
of characterize that

833
00:31:08,630 --> 00:31:06,559
yeah i'd see i'd say uh generically

834
00:31:11,509 --> 00:31:08,640
speaking it is definitely a

835
00:31:13,110 --> 00:31:11,519
a more intense day tomorrow uh fly by

836
00:31:14,950 --> 00:31:13,120
today allowed us to check out a lot of

837
00:31:17,269 --> 00:31:14,960
systems and retire a lot of risk for

838
00:31:19,509 --> 00:31:17,279

tomorrow's flight we're also able to get

839
00:31:21,029 --> 00:31:19,519
some uh additional objectives where we

840
00:31:23,110 --> 00:31:21,039
powered up the lidars and the thermal

841
00:31:25,430 --> 00:31:23,120
imagers which we use for very close

842
00:31:27,509 --> 00:31:25,440
range navigation to space station and

843
00:31:29,509 --> 00:31:27,519
those checked out good so again we

844
00:31:31,909 --> 00:31:29,519
retired a lot of risk for tomorrow but

845
00:31:34,549 --> 00:31:31,919
just like what you said there's a more

846
00:31:37,269 --> 00:31:34,559
fine maneuvering the dragon has a lot of

847
00:31:39,909 --> 00:31:37,279
automatic systems on board to protect uh

848
00:31:42,470 --> 00:31:39,919
station and dragon itself from

849
00:31:44,230 --> 00:31:42,480
if if we see a malfunction we haven't

850
00:31:46,389 --> 00:31:44,240
seen anything that would require those

851
00:31:49,190 --> 00:31:46,399
right now but it is the first time we're

852
00:31:51,830 --> 00:31:49,200
using them so it is a test flight and uh

853
00:31:55,990 --> 00:31:51,840
we are we are being uh cautiously

854
00:31:58,950 --> 00:31:56,870
thank you

855
00:32:06,870 --> 00:31:58,960
all right thanks james uh last one jay

856
00:32:06,880 --> 00:32:12,710
jay are you there

857
00:32:16,950 --> 00:32:14,470
okay are there any follow-ups here in

858
00:32:18,710 --> 00:32:16,960
houston anybody

859
00:32:20,389 --> 00:32:18,720
okay before we step away let's take a

860
00:32:23,029 --> 00:32:20,399
look at the remainder of our programming

861
00:32:25,669 --> 00:32:23,039
schedule for nasa television

862
00:32:27,269 --> 00:32:25,679
we will have iss update later on today

863
00:32:29,430 --> 00:32:27,279

at 10 o'clock at the top of the hour 10

864
00:32:31,509 --> 00:32:29,440
central 11 o'clock eastern

865
00:32:34,149 --> 00:32:31,519
we will return bright and early tomorrow

866
00:32:36,070 --> 00:32:34,159
morning at 1 a.m central time 2 a.m

867
00:32:38,230 --> 00:32:36,080
eastern time for live coverage of the

868
00:32:39,350 --> 00:32:38,240
grapple and birthing of dragon and we

869
00:32:42,310 --> 00:32:39,360
will stay on the air throughout the

870
00:32:44,549 --> 00:32:42,320
entire operation at noon central time

871
00:32:46,310 --> 00:32:44,559
we'll have a mission status briefing

872
00:32:48,870 --> 00:32:46,320
to take a look at the day's activities

873
00:32:50,549 --> 00:32:48,880
and uh how things have gone and then on

874
00:32:52,789 --> 00:32:50,559
saturday morning we will be on the air

875
00:32:55,830 --> 00:32:52,799
at 4 30 a.m central time

876
00:32:57,269 --> 00:32:55,840
5 30 a.m eastern time for coverage of

877
00:32:59,190 --> 00:32:57,279
the hatch opening

878
00:33:01,990 --> 00:32:59,200
and then later on that day at 10 25 a.m

879
00:33:03,509 --> 00:33:02,000
central time 11 25 a.m eastern time

880
00:33:05,590 --> 00:33:03,519
we'll have a crew news conference with

881
00:33:07,430 --> 00:33:05,600
some members of expedition 31 as they

882
00:33:09,509 --> 00:33:07,440
talk about their experiences

883
00:33:11,750 --> 00:33:09,519
and their reflections of the milestone

884
00:33:13,830 --> 00:33:11,760
of this mission so that'll wrap it up

885
00:33:15,350 --> 00:33:13,840
for us as a reminder iss update is up

886
00:33:17,990 --> 00:33:15,360
next here on nasa television at the top