1
00:00:04,710 --> 00:00:03,270
good morning everybody from the johnson

2
00:00:05,829 --> 00:00:04,720
space center in houston and welcome to

3
00:00:08,230 --> 00:00:05,839
today's briefing we're going to be

4
00:00:10,070 --> 00:00:08,240
taking a look at tomorrow's activities

5
00:00:11,749 --> 00:00:10,080
as the spacex dragon gets ready to be

6
00:00:13,830 --> 00:00:11,759
ungrappled from the international space

7
00:00:15,589 --> 00:00:13,840
station and begin its journey back to

8
00:00:17,189 --> 00:00:15,599
earth joining me here in houston is

9
00:00:19,109 --> 00:00:17,199
holly ridings who is the lead nasa

10
00:00:20,870 --> 00:00:19,119
flight director for this mission we'll

11
00:00:22,390 --> 00:00:20,880
also be going out to john coloras out at

12
00:00:23,590 --> 00:00:22,400
spacex headquarters in hawthorne

13
00:00:25,189 --> 00:00:23,600

california but we'll start off with

14
00:00:27,029 --> 00:00:25,199
holly

15
00:00:30,150 --> 00:00:27,039
all right well good morning everyone

16
00:00:32,870 --> 00:00:30,160
again it's exciting to be here and

17
00:00:34,950 --> 00:00:32,880
discuss departure of the dragon from the

18
00:00:36,549 --> 00:00:34,960
international space station

19
00:00:38,709 --> 00:00:36,559
before we get started on on that

20
00:00:40,950 --> 00:00:38,719
sequence of events i'll tell you a few

21
00:00:41,910 --> 00:00:40,960
things that have happened since last we

22
00:00:43,510 --> 00:00:41,920
spoke

23
00:00:45,270 --> 00:00:43,520
just a few days ago

24
00:00:47,029 --> 00:00:45,280
last saturday

25
00:00:49,510 --> 00:00:47,039
after the successful capture on friday

26
00:00:51,750 --> 00:00:49,520
we did open the hatches

27
00:00:53,189 --> 00:00:51,760
and go into the dragon and of course the

28
00:00:56,630 --> 00:00:53,199
crew reported

29
00:00:58,709 --> 00:00:56,640
that it really was an exciting time and

30
00:01:00,709 --> 00:00:58,719
looked great inside the dragon gave the

31
00:01:03,189 --> 00:01:00,719
crew a little bit of time off and then

32
00:01:06,789 --> 00:01:03,199
monday earlier this week we got right to

33
00:01:08,710 --> 00:01:06,799
work performing the cargo operations for

34
00:01:09,670 --> 00:01:08,720
this dragon demonstration

35
00:01:11,910 --> 00:01:09,680
mission

36
00:01:14,149 --> 00:01:11,920
the dragon did carry

37
00:01:16,149 --> 00:01:14,159
some cargo up to the station station to

38
00:01:18,789 --> 00:01:16,159

demonstrate that capability and then we

39
00:01:21,350 --> 00:01:18,799
will be returning cargo as well

40
00:01:23,350 --> 00:01:21,360
the crew worked out a plan amongst them

41
00:01:24,390 --> 00:01:23,360
themselves very efficiently and managed

42
00:01:26,469 --> 00:01:24,400
to do

43
00:01:27,830 --> 00:01:26,479
almost all the cargo operations in a in

44
00:01:30,069 --> 00:01:27,840
a single day

45
00:01:31,910 --> 00:01:30,079
took them quite a few crew hours but

46
00:01:33,749 --> 00:01:31,920
just one calendar day to get that done

47
00:01:35,749 --> 00:01:33,759
so we were very excited

48
00:01:37,190 --> 00:01:35,759
that they were able to do that when

49
00:01:40,710 --> 00:01:37,200
we're only staying attached to the

50
00:01:43,109 --> 00:01:40,720
station for this short seven day mission

51
00:01:45,590 --> 00:01:43,119
the next day on tuesday we did have a

52
00:01:47,270 --> 00:01:45,600
little bit of cargo ops to finish up and

53
00:01:48,469 --> 00:01:47,280
then today

54
00:01:51,190 --> 00:01:48,479
currently

55
00:01:53,510 --> 00:01:51,200
on console the team is working through

56
00:01:56,389 --> 00:01:53,520
the hatch closer which happened uh just

57
00:01:59,350 --> 00:01:56,399
a while ago gmt-13 so about 8 am local

58
00:02:01,350 --> 00:01:59,360
time and they're in the process of of

59
00:02:03,670 --> 00:02:01,360
what we call de-outfitting the vestibule

60
00:02:05,749 --> 00:02:03,680
that little space between the dragon

61
00:02:07,590 --> 00:02:05,759
hatch and the node 2 hatch

62
00:02:10,070 --> 00:02:07,600
disconnecting some

63
00:02:11,830 --> 00:02:10,080

cables putting back in the controllers

64
00:02:14,630 --> 00:02:11,840
that operate our common berthing

65
00:02:17,030 --> 00:02:14,640
mechanism in preparation for the unbirth

66
00:02:19,030 --> 00:02:17,040
and the departure tomorrow so those

67
00:02:20,949 --> 00:02:19,040
activities will take up

68
00:02:23,510 --> 00:02:20,959
kind of a remainder of the the crew day

69
00:02:25,350 --> 00:02:23,520
today the crew is going to bed a little

70
00:02:27,110 --> 00:02:25,360
bit early today because tomorrow morning

71
00:02:29,670 --> 00:02:27,120
we're going to wake him up two hours

72
00:02:32,790 --> 00:02:29,680
earlier than the nominal time so that's

73
00:02:36,070 --> 00:02:32,800
gmt 0-400

74
00:02:39,430 --> 00:02:36,080
in terms of the day itself big wise

75
00:02:41,350 --> 00:02:39,440
tomorrow we are kind of optimizing our

76
00:02:42,949 --> 00:02:41,360
release and departure from the space

77
00:02:45,990 --> 00:02:42,959
station

78
00:02:48,070 --> 00:02:46,000
for the dragon spacex team

79
00:02:50,550 --> 00:02:48,080
to give them the best opportunity for

80
00:02:52,309 --> 00:02:50,560
this test flight for this demonstration

81
00:02:54,229 --> 00:02:52,319
for the dragon to come home successfully

82
00:02:56,869 --> 00:02:54,239
and and john will talk in a few minutes

83
00:02:57,830 --> 00:02:56,879
about some of the the items that they've

84
00:03:02,630 --> 00:02:57,840
uh

85
00:03:04,949 --> 00:03:02,640
of their re-entry sequence

86
00:03:06,790 --> 00:03:04,959
so going back to the departure tomorrow

87
00:03:09,990 --> 00:03:06,800
the crew is waking up at

88
00:03:11,910 --> 00:03:10,000

0-400 gmt they'll get right to work

89
00:03:13,509 --> 00:03:11,920
after just a few minutes

90
00:03:15,589 --> 00:03:13,519
finishing up the

91
00:03:18,070 --> 00:03:15,599
again the de-outfitting of that

92
00:03:20,470 --> 00:03:18,080
vestibule area so cleaning up the very

93
00:03:22,869 --> 00:03:20,480
last power jumper that we're leaving

94
00:03:25,110 --> 00:03:22,879
connected overnight tonight in order for

95
00:03:26,630 --> 00:03:25,120
the dragon to remain on station power so

96
00:03:29,190 --> 00:03:26,640
to finish that up they go ahead and

97
00:03:30,869 --> 00:03:29,200
close the node 2 hatch then they've got

98
00:03:33,750 --> 00:03:30,879
a significant amount of time a couple of

99
00:03:35,910 --> 00:03:33,760
hours to depress that vestibule that

100
00:03:37,350 --> 00:03:35,920
space between the dragon hatch and the

101
00:03:39,030 --> 00:03:37,360
node 2 hatch

102
00:03:42,309 --> 00:03:39,040
when that's completed then they'll step

103
00:03:44,710 --> 00:03:42,319
into their cbm operations

104
00:03:46,630 --> 00:03:44,720
we did take the robotic arm back to

105
00:03:48,710 --> 00:03:46,640
position where it's already grappled to

106
00:03:51,830 --> 00:03:48,720
the dragon one other activity that

107
00:03:54,470 --> 00:03:51,840
happened since dragon was attached last

108
00:03:56,630 --> 00:03:54,480
week we did do an external survey of the

109
00:03:57,509 --> 00:03:56,640
dragon of the the trunk space the solar

110
00:04:00,070 --> 00:03:57,519
rays

111
00:04:02,550 --> 00:04:00,080
the outside of that dragon to gather a

112
00:04:04,869 --> 00:04:02,560
bunch of data for this demonstration and

113
00:04:06,630 --> 00:04:04,879

this test flight for future flights so

114
00:04:09,350 --> 00:04:06,640
we took the robotic arm after that

115
00:04:11,750 --> 00:04:09,360
activity and back uh grappled to the

116
00:04:13,589 --> 00:04:11,760
dragon where it is today so

117
00:04:15,589 --> 00:04:13,599
after the cbm activities the crew will

118
00:04:17,349 --> 00:04:15,599
be able to step right back in

119
00:04:19,830 --> 00:04:17,359
to the robotic arm

120
00:04:22,870 --> 00:04:19,840
activities a series of maneuvers you do

121
00:04:26,230 --> 00:04:22,880
the unberth from the space station

122
00:04:29,670 --> 00:04:26,240
cbm and then you move the arm out to a

123
00:04:31,030 --> 00:04:29,680
release position the release itself is

124
00:04:33,110 --> 00:04:31,040
targeted for

125
00:04:34,950 --> 00:04:33,120
0.935

126
00:04:36,469 --> 00:04:34,960
gmt

127
00:04:37,830 --> 00:04:36,479
certainly with this test flight this

128
00:04:40,070 --> 00:04:37,840
being the first time we've run through

129
00:04:42,550 --> 00:04:40,080
that series of activities that i that i

130
00:04:44,070 --> 00:04:42,560
just described there's some variability

131
00:04:47,030 --> 00:04:44,080
in that time but that is our timeline

132
00:04:49,430 --> 00:04:47,040
time that we're targeting the 0935

133
00:04:52,070 --> 00:04:49,440
the departure sequence is fairly quick

134
00:04:55,189 --> 00:04:52,080
it's a three burn series two small burns

135
00:04:58,310 --> 00:04:55,199
and then one big burn so turn it on the

136
00:05:00,950 --> 00:04:58,320
dragon engines and the dragon will head

137
00:05:03,270 --> 00:05:00,960
away from the space station outside of

138
00:05:05,830 --> 00:05:03,280

of the integrated uh space and that will

139
00:05:08,629 --> 00:05:05,840
be the end of our integrated activity

140
00:05:11,270 --> 00:05:08,639
with the spacex dragon team and that

141
00:05:14,390 --> 00:05:11,280
process is 10 or 11 minutes

142
00:05:16,469 --> 00:05:14,400
after the release time so again very

143
00:05:17,590 --> 00:05:16,479
quick very different than rendezvous day

144
00:05:20,390 --> 00:05:17,600
when we spend a lot of time in

145
00:05:21,670 --> 00:05:20,400
integrated space the dragon will head on

146
00:05:23,749 --> 00:05:21,680
out and then

147
00:05:24,629 --> 00:05:23,759
be on its own in terms of the dragon

148
00:05:26,390 --> 00:05:24,639
team

149
00:05:29,350 --> 00:05:26,400
controlling and managing the rest of the

150
00:05:31,110 --> 00:05:29,360
activities for the day as they work

151
00:05:33,749 --> 00:05:31,120
through their re-entry and splash down

152
00:05:35,430 --> 00:05:33,759
sequence and so with that i'll hand off

153
00:05:37,590 --> 00:05:35,440
to john and he'll walk you through all

154
00:05:41,110 --> 00:05:37,600
of those activities that his team will

155
00:05:46,790 --> 00:05:43,749
hey thanks holly so holly uh perfectly

156
00:05:48,550 --> 00:05:46,800
described our departure sequence once we

157
00:05:49,590 --> 00:05:48,560
leave integrated space from the space

158
00:05:51,990 --> 00:05:49,600
station

159
00:05:54,150 --> 00:05:52,000
approach ellipsoid we'll be conducting

160
00:05:57,189 --> 00:05:54,160
numerous operations uh which include

161
00:05:59,590 --> 00:05:57,199
closing our gnc bay door that door is

162
00:06:01,990 --> 00:05:59,600
where the grapple fixture is located

163
00:06:03,749 --> 00:06:02,000

where station grabbed us with the arm so

164
00:06:06,950 --> 00:06:03,759
be closing that up performing some

165
00:06:08,790 --> 00:06:06,960
checkouts and then performing our large

166
00:06:11,590 --> 00:06:08,800
re-entry burn which will take about 10

167
00:06:13,590 --> 00:06:11,600
minutes and with that uh

168
00:06:15,029 --> 00:06:13,600
about five and a half hours after

169
00:06:16,790 --> 00:06:15,039
release from the arm we should be in the

170
00:06:19,189 --> 00:06:16,800
water our recovery forces will be

171
00:06:21,510 --> 00:06:19,199
standing by they departed late monday

172
00:06:24,150 --> 00:06:21,520
night and they're about 16 hours out

173
00:06:26,230 --> 00:06:24,160
from the splashdown zone and they'll be

174
00:06:28,150 --> 00:06:26,240
ready to recover

175
00:06:29,749 --> 00:06:28,160
now it's important to note again we have

176
00:06:31,830 --> 00:06:29,759
a lot ahead of us

177
00:06:34,550 --> 00:06:31,840
on the spacex side once we leave

178
00:06:36,629 --> 00:06:34,560
integrated space with nasa we still have

179
00:06:38,150 --> 00:06:36,639
the entire reentry to perform we're

180
00:06:40,469 --> 00:06:38,160
really looking forward to it we've done

181
00:06:41,670 --> 00:06:40,479
it once on c1 but it's still a very

182
00:06:44,550 --> 00:06:41,680
challenging

183
00:06:45,909 --> 00:06:44,560
phase of flight and uh

184
00:06:48,390 --> 00:06:45,919
only a few countries have done this

185
00:06:50,870 --> 00:06:48,400
before so we're not taking this lightly

186
00:06:54,309 --> 00:06:50,880
at all but the crew looks good and we

187
00:06:57,270 --> 00:06:56,070
okay we'll take some questions now here

188
00:06:58,950 --> 00:06:57,280

in houston first then we'll go to the

189
00:07:05,189 --> 00:06:58,960
phone lines we'll start over here with

190
00:07:10,710 --> 00:07:07,510
thank you mark caro for aviation week i

191
00:07:12,870 --> 00:07:10,720
think my first question is for holly

192
00:07:14,870 --> 00:07:12,880
uh holly writings

193
00:07:16,950 --> 00:07:14,880
when does the sort of the nasa

194
00:07:18,550 --> 00:07:16,960
operational phase

195
00:07:21,270 --> 00:07:18,560
of this flight

196
00:07:23,110 --> 00:07:21,280
end is it with the ungrappled

197
00:07:24,469 --> 00:07:23,120
or is it a

198
00:07:26,309 --> 00:07:24,479
point down the line i just kind of

199
00:07:29,909 --> 00:07:26,319
wanted to see where you consider the

200
00:07:32,230 --> 00:07:29,919
demarcation okay it's actually as john

201
00:07:34,629 --> 00:07:32,240
mentioned when the dragon exits what's

202
00:07:38,150 --> 00:07:34,639
called the approach ellipsoid uh so

203
00:07:39,909 --> 00:07:38,160
that's the um uh one kilometer by two

204
00:07:42,550 --> 00:07:39,919
kilometer dune radius if you did

205
00:07:44,869 --> 00:07:42,560
diameter it's two by four uh kilometer

206
00:07:46,070 --> 00:07:44,879
space and so to go through the burn

207
00:07:48,629 --> 00:07:46,080
sequence one more time you do the

208
00:07:51,110 --> 00:07:48,639
release uh there's two uh small

209
00:07:53,029 --> 00:07:51,120
departure burns dragon performs that

210
00:07:54,710 --> 00:07:53,039
you kind of go down the r bar you sort

211
00:07:56,070 --> 00:07:54,720
of directly towards earth and then a

212
00:07:57,430 --> 00:07:56,080
larger burn

213
00:08:00,230 --> 00:07:57,440

that takes you

214
00:08:01,350 --> 00:08:00,240
out of the approach ellipsoid so roughly

215
00:08:02,950 --> 00:08:01,360
10 minutes

216
00:08:06,070 --> 00:08:02,960
if i look at the timeline i think it's

217
00:08:08,309 --> 00:08:06,080
exactly 11 after release will be outside

218
00:08:10,550 --> 00:08:08,319
of the approach ellipsoid and that is

219
00:08:12,390 --> 00:08:10,560
the end of the integrated operation

220
00:08:14,150 --> 00:08:12,400
point portion so per our flight rolls

221
00:08:16,150 --> 00:08:14,160
outside of the approach ellipsoid on a

222
00:08:18,469 --> 00:08:16,160
safe trajectory away from the space

223
00:08:20,070 --> 00:08:18,479
station we do continue to support the

224
00:08:20,790 --> 00:08:20,080
dragon team

225
00:08:22,710 --> 00:08:20,800
with

226
00:08:24,150 --> 00:08:22,720
tdrs scheduling and

227
00:08:27,510 --> 00:08:24,160
communication

228
00:08:29,990 --> 00:08:27,520
for them but in terms of the authority

229
00:08:32,790 --> 00:08:30,000
or outside of the integrated space and

230
00:08:35,269 --> 00:08:32,800
then we turn into a supporting role for

231
00:08:37,269 --> 00:08:35,279
their mission at that point

232
00:08:38,870 --> 00:08:37,279
okay and if i can ask a follow-up i have

233
00:08:40,709 --> 00:08:38,880
one for uh

234
00:08:44,230 --> 00:08:40,719
john could you

235
00:08:47,750 --> 00:08:44,240
as as accurately as you can

236
00:08:48,790 --> 00:08:47,760
describe where the recovery zone is

237
00:08:51,030 --> 00:08:48,800
and

238
00:08:52,790 --> 00:08:51,040

during the re-entry

239
00:08:55,030 --> 00:08:52,800
can you explain

240
00:08:58,070 --> 00:08:55,040
how you'll do your tracking i in other

241
00:08:59,990 --> 00:08:58,080
words do you have more than

242
00:09:01,910 --> 00:09:00,000
ships for the recovery do you have any

243
00:09:04,470 --> 00:09:01,920
aircraft involved

244
00:09:07,110 --> 00:09:04,480
and and once you bring dragon aboard the

245
00:09:08,710 --> 00:09:07,120
recovery ship can you explain

246
00:09:11,030 --> 00:09:08,720
where you'll take it next is it

247
00:09:14,470 --> 00:09:11,040
hawthorne for uh de-stowing and

248
00:09:18,710 --> 00:09:15,829
certainly hopefully i can remember

249
00:09:21,509 --> 00:09:18,720
answering all your questions so first

250
00:09:24,470 --> 00:09:21,519
our splashdown zone is about 490

251
00:09:27,430 --> 00:09:24,480
nautical miles uh southwest of los

252
00:09:30,150 --> 00:09:27,440
angeles more to the west and south uh

253
00:09:31,829 --> 00:09:30,160
the recovery boats it's a fleet of three

254
00:09:33,829 --> 00:09:31,839
vessels i'll be standing by for that

255
00:09:36,550 --> 00:09:33,839
with within supporting fast boats that

256
00:09:39,110 --> 00:09:36,560
go out and save the spacecraft

257
00:09:40,949 --> 00:09:39,120
we expect to

258
00:09:42,870 --> 00:09:40,959
return the capsule

259
00:09:45,430 --> 00:09:42,880
it will take about maybe two to three

260
00:09:47,910 --> 00:09:45,440
days to return and on return to port

261
00:09:48,870 --> 00:09:47,920
will then go directly to our facility in

262
00:09:51,829 --> 00:09:48,880
texas

263
00:09:54,070 --> 00:09:51,839

for cargo unloading and for

264
00:09:55,670 --> 00:09:54,080
further spacecraft inspection

265
00:09:57,910 --> 00:09:55,680
and i'm sorry you had a question about

266
00:09:59,990 --> 00:09:57,920
tracking i believe as well so we have a

267
00:10:02,470 --> 00:10:00,000
number of ways that we track position on

268
00:10:04,550 --> 00:10:02,480
dragon after the re-entry burn

269
00:10:06,470 --> 00:10:04,560
first we have four uh inertial

270
00:10:08,870 --> 00:10:06,480
measurement units that are providing

271
00:10:11,030 --> 00:10:08,880
updated positions those are updated by

272
00:10:13,509 --> 00:10:11,040
uh our gps units that are on board the

273
00:10:14,630 --> 00:10:13,519
spacecraft these all communicate with us

274
00:10:15,590 --> 00:10:14,640
via

275
00:10:17,910 --> 00:10:15,600
tdrs

276
00:10:20,230 --> 00:10:17,920
connection as uh holly had mentioned

277
00:10:22,230 --> 00:10:20,240
using the nasa assets there

278
00:10:24,150 --> 00:10:22,240
we also have a number of ground stations

279
00:10:26,150 --> 00:10:24,160
that will pick up dragon during its

280
00:10:28,310 --> 00:10:26,160
descent and then a

281
00:10:30,069 --> 00:10:28,320
telemetry dish is also a part of the

282
00:10:30,949 --> 00:10:30,079
recovery vessel so we have kind of a

283
00:10:32,630 --> 00:10:30,959
mini

284
00:10:35,030 --> 00:10:32,640
telemetry vessel out there i'll be

285
00:10:37,030 --> 00:10:35,040
tracking dragon all the way to the water

286
00:10:39,910 --> 00:10:37,040
furthermore we have a separate recovery

287
00:10:41,750 --> 00:10:39,920
system that it consists of another gps

288
00:10:43,670 --> 00:10:41,760

system that uses a different

289
00:10:45,430 --> 00:10:43,680
communication system to relay to us

290
00:10:47,350 --> 00:10:45,440
globally where dragon would be in the

291
00:10:48,790 --> 00:10:47,360
water

292
00:10:53,990 --> 00:10:48,800
your final question

293
00:10:59,509 --> 00:10:56,870
uh yes sir i wondered

294
00:11:01,430 --> 00:10:59,519
you you mentioned that the

295
00:11:03,190 --> 00:11:01,440
that the recovery ships will come to a

296
00:11:05,670 --> 00:11:03,200
port and i didn't know that was

297
00:11:07,750 --> 00:11:05,680
hawthorne and then you fly it to

298
00:11:08,870 --> 00:11:07,760
mcgregor and texas if i understood you

299
00:11:11,030 --> 00:11:08,880
correctly i just wonder if you could

300
00:11:13,990 --> 00:11:11,040
sort of clarify

301
00:11:16,630 --> 00:11:14,000
the full voyage of spacex or where you

302
00:11:19,590 --> 00:11:16,640
take it i'm not i'm not clear

303
00:11:21,110 --> 00:11:19,600
sure so we uh recover dragon onto our

304
00:11:23,509 --> 00:11:21,120
recovery vessel

305
00:11:25,350 --> 00:11:23,519
uh and then from there we bring it into

306
00:11:27,509 --> 00:11:25,360
the port of los angeles and then

307
00:11:29,829 --> 00:11:27,519
immediately uh transport transported to

308
00:11:31,590 --> 00:11:29,839
our mcgregor texas facility

309
00:11:32,949 --> 00:11:31,600
you'd also ask about aircraft we

310
00:11:34,949 --> 00:11:32,959
currently have a number of aircraft

311
00:11:37,750 --> 00:11:34,959
supporting we have our own

312
00:11:40,949 --> 00:11:37,760
jet they'll be standing by but we do use

313
00:11:42,710 --> 00:11:40,959

the nasa p3 assets one is an infrared

314
00:11:44,870 --> 00:11:42,720
imaging aircraft and the other is a

315
00:11:46,470 --> 00:11:44,880
telemetry aircraft these are same

316
00:11:47,829 --> 00:11:46,480
aircraft that were used for shuttle

317
00:11:49,509 --> 00:11:47,839
return flights

318
00:11:52,230 --> 00:11:49,519
very capable assets and they'll be

319
00:11:53,430 --> 00:11:52,240
standing by and capturing dragon during

320
00:11:55,430 --> 00:11:53,440
the re-entry

321
00:11:57,910 --> 00:11:55,440
all the way to splashdown just like what

322
00:12:00,069 --> 00:11:57,920
they did to support us on the dragon c1

323
00:12:05,269 --> 00:12:00,079
mission

324
00:12:10,150 --> 00:12:07,829
hi robert perlman with collectspace.com

325
00:12:13,190 --> 00:12:10,160
with a question for john maybe also for

326
00:12:15,750 --> 00:12:13,200
josh um you mentioned having aerial

327
00:12:16,949 --> 00:12:15,760
imagery assets what might we see during

328
00:12:20,710 --> 00:12:16,959
the actual

329
00:12:24,629 --> 00:12:20,720
uh re-entry and um and splashdown

330
00:12:27,030 --> 00:12:24,639
i'll let john take that one first

331
00:12:29,350 --> 00:12:27,040
so uh the assets we have on the aircraft

332
00:12:30,949 --> 00:12:29,360
it's uh primarily infrared so it's

333
00:12:34,150 --> 00:12:30,959
trying to capture dragon during the

334
00:12:36,629 --> 00:12:34,160
re-entry process uh so you'll see uh

335
00:12:38,470 --> 00:12:36,639
varus heating profile on dragon itself

336
00:12:40,310 --> 00:12:38,480
at a rather long distance

337
00:12:42,310 --> 00:12:40,320
but still enough for us to get some good

338
00:12:44,470 --> 00:12:42,320

data from and then on the recovery

339
00:12:47,030 --> 00:12:44,480
vessels themselves we also have high

340
00:12:50,069 --> 00:12:47,040
definition video and still camera

341
00:12:52,310 --> 00:12:50,079
photography as well as a telemetry asset

342
00:12:54,949 --> 00:12:52,320
and that will be capturing uh dragon on

343
00:12:58,870 --> 00:12:54,959
board video but that video is primarily

344
00:13:03,430 --> 00:13:01,750
okay and a second question for john

345
00:13:05,910 --> 00:13:03,440
with regards to

346
00:13:09,030 --> 00:13:05,920
the nasa cargo on board what's your

347
00:13:11,590 --> 00:13:09,040
timeline for once the capsule's back in

348
00:13:14,150 --> 00:13:11,600
mcgregor for delivering the payload back

349
00:13:18,310 --> 00:13:14,160
to nasa and how does that compare to the

350
00:13:19,590 --> 00:13:18,320
timeline for an operational crs flight

351
00:13:21,829 --> 00:13:19,600
certainly so

352
00:13:24,870 --> 00:13:21,839
we have two types of cargo that we have

353
00:13:26,949 --> 00:13:24,880
requirements uh to deliver back to nasa

354
00:13:29,509 --> 00:13:26,959
and we're going to be demonstrating the

355
00:13:32,310 --> 00:13:29,519
early access cargo return which is a

356
00:13:34,629 --> 00:13:32,320
pretty special return

357
00:13:36,069 --> 00:13:34,639
return profile that wasn't normally

358
00:13:37,990 --> 00:13:36,079
meant for this mission but we'd like to

359
00:13:40,550 --> 00:13:38,000
demonstrate it and that's to get high

360
00:13:42,870 --> 00:13:40,560
value experiments back to nasa within 48

361
00:13:45,189 --> 00:13:42,880
hours of splashdown so that's a stretch

362
00:13:47,829 --> 00:13:45,199
goal for ours but we are going to

363
00:13:50,310 --> 00:13:47,839

exercise that and turn that over to nasa

364
00:13:52,710 --> 00:13:50,320
48 within 48 hours after splashdown in

365
00:13:55,430 --> 00:13:52,720
los angeles the second requirement is to

366
00:13:57,590 --> 00:13:55,440
return standard cargo to nasa within 14

367
00:13:58,389 --> 00:13:57,600
days and that we should definitely meet

368
00:14:00,470 --> 00:13:58,399
uh

369
00:14:02,710 --> 00:14:00,480
with the turnover occurring in mcgregor

370
00:14:04,310 --> 00:14:02,720
texas which works out well for nasa

371
00:14:05,910 --> 00:14:04,320
because most of the processing for the

372
00:14:09,189 --> 00:14:05,920
payloads will be occurring out of

373
00:14:11,269 --> 00:14:09,199
johnson space flight center in houston

374
00:14:13,590 --> 00:14:11,279
okay over here

375
00:14:15,509 --> 00:14:13,600
yes i'm fort atkinson with kriv here in

376
00:14:17,430 --> 00:14:15,519
houston i wonder just for the layman so

377
00:14:19,670 --> 00:14:17,440
they can understand better and me too

378
00:14:21,030 --> 00:14:19,680
for that matter what have you learned so

379
00:14:22,870 --> 00:14:21,040
far

380
00:14:25,189 --> 00:14:22,880
perhaps that you didn't expect to learn

381
00:14:27,269 --> 00:14:25,199
quite this early in the mission

382
00:14:30,069 --> 00:14:27,279
has something occurred that you you said

383
00:14:33,750 --> 00:14:30,079
to yourself wow that was easier or more

384
00:14:38,949 --> 00:14:37,269
let's see um in terms of of learning uh

385
00:14:41,430 --> 00:14:38,959
you know you're constantly learning we

386
00:14:43,189 --> 00:14:41,440
spent in john's case you know

387
00:14:45,350 --> 00:14:43,199
five or so years in my case almost three

388
00:14:46,310 --> 00:14:45,360

years designing all of these activities

389
00:14:48,069 --> 00:14:46,320
and so

390
00:14:49,990 --> 00:14:48,079
to see them run

391
00:14:51,910 --> 00:14:50,000
you know you're always learning things

392
00:14:53,509 --> 00:14:51,920
i'm trying to think of a good kind of

393
00:14:55,269 --> 00:14:53,519
high level example

394
00:14:57,110 --> 00:14:55,279
certainly the rendezvous and capture you

395
00:14:59,430 --> 00:14:57,120
know john and i worked through that

396
00:15:01,590 --> 00:14:59,440
together and so to see

397
00:15:03,910 --> 00:15:01,600
how dragon was going to behave as it's

398
00:15:06,230 --> 00:15:03,920
as it's moving towards the space station

399
00:15:07,910 --> 00:15:06,240
with all of the sensors that communicate

400
00:15:09,110 --> 00:15:07,920
with the space station and determine you

401
00:15:11,030 --> 00:15:09,120
know the location the dragon and the

402
00:15:12,389 --> 00:15:11,040
location of the space station so we all

403
00:15:14,069 --> 00:15:12,399
learned a lot about how those are going

404
00:15:16,069 --> 00:15:14,079
to behave and i know that the post

405
00:15:19,189 --> 00:15:16,079
flight the spacex team is going to look

406
00:15:20,550 --> 00:15:19,199
at those in a lot of a lot of detail

407
00:15:22,949 --> 00:15:20,560
we learned a lot about how the dragon's

408
00:15:25,110 --> 00:15:22,959
going to behave when the crew

409
00:15:27,670 --> 00:15:25,120
captures it right so you have all of

410
00:15:29,749 --> 00:15:27,680
this analysis ahead of time that says

411
00:15:31,670 --> 00:15:29,759
when you turn off of the engines and it

412
00:15:33,670 --> 00:15:31,680
and it sits in that spot where the arm

413
00:15:35,910 --> 00:15:33,680

reaches out to grab it

414
00:15:37,110 --> 00:15:35,920
how much is it going to move around

415
00:15:39,110 --> 00:15:37,120
and so

416
00:15:41,030 --> 00:15:39,120
that analysis

417
00:15:43,430 --> 00:15:41,040
told us that it was going to move around

418
00:15:46,230 --> 00:15:43,440
a little bit um and actually i think i'd

419
00:15:48,790 --> 00:15:46,240
have to look at the telemetry but to my

420
00:15:51,030 --> 00:15:48,800
eye it looked like it did very well and

421
00:15:53,189 --> 00:15:51,040
met the expectations and was very good

422
00:15:54,870 --> 00:15:53,199
for the crew to go and

423
00:15:56,389 --> 00:15:54,880
grab it so that was one thing that at

424
00:15:57,189 --> 00:15:56,399
least i was concerned about ahead of

425
00:15:58,470 --> 00:15:57,199
time

426
00:16:01,030 --> 00:15:58,480
because you want to make sure it's going

427
00:16:02,470 --> 00:16:01,040
to move in a little and

428
00:16:03,509 --> 00:16:02,480
sit in one place so that the crew can

429
00:16:05,189 --> 00:16:03,519
grab it so

430
00:16:07,030 --> 00:16:05,199
to me i you know i learned that so we

431
00:16:08,470 --> 00:16:07,040
learned how the vehicle behaved

432
00:16:11,269 --> 00:16:08,480
the other big thing we really learned

433
00:16:13,990 --> 00:16:11,279
how we'll work together as a team and

434
00:16:15,590 --> 00:16:14,000
overall that went very very well there

435
00:16:18,150 --> 00:16:15,600
are differences in the way we do

436
00:16:20,550 --> 00:16:18,160
operations of course differences in the

437
00:16:22,389 --> 00:16:20,560
structure of our control center but

438
00:16:24,710 --> 00:16:22,399

mostly we learned that

439
00:16:27,430 --> 00:16:24,720
to bring in a new a new partner the

440
00:16:29,910 --> 00:16:27,440
spacex team we were able to communicate

441
00:16:32,629 --> 00:16:29,920
and accomplish something uh very

442
00:16:34,629 --> 00:16:32,639
complicated um in space with two dynamic

443
00:16:35,910 --> 00:16:34,639
vehicles so those are probably my two

444
00:16:39,590 --> 00:16:35,920
biggest ones i don't know john yet you

445
00:16:43,509 --> 00:16:41,749
just to reiterate again uh how well the

446
00:16:46,629 --> 00:16:43,519
teams work together and the value of

447
00:16:48,629 --> 00:16:46,639
training are really allowed us to ensure

448
00:16:51,670 --> 00:16:48,639
success for the approach and the

449
00:16:53,430 --> 00:16:51,680
birthing operation um also just like how

450
00:16:56,310 --> 00:16:53,440
holly mentioned the behavior of the

451
00:16:58,790 --> 00:16:56,320
vehicle was as expected and that was a

452
00:17:00,870 --> 00:16:58,800
big confidence boost again to to uh

453
00:17:03,590 --> 00:17:00,880
reiterate how good our analysis was on

454
00:17:05,189 --> 00:17:03,600
it and uh honestly uh we also learned

455
00:17:07,510 --> 00:17:05,199
that at least i learned i have no

456
00:17:09,590 --> 00:17:07,520
trouble uh sleeping during the day uh

457
00:17:12,390 --> 00:17:09,600
the shifts were great shift schedule

458
00:17:14,710 --> 00:17:12,400
work worked really well and uh the crews

459
00:17:19,350 --> 00:17:14,720
both on the nasa side and the spacex

460
00:17:21,350 --> 00:17:19,360
side uh really were strong

461
00:17:22,789 --> 00:17:21,360
okay let's go to the phone lines uh i

462
00:17:27,429 --> 00:17:22,799
believe we have ken kramer with space

463
00:17:30,870 --> 00:17:29,430

okay let's go to the phone lines uh i

464
00:17:34,150 --> 00:17:30,880
believe we have ken kramer with space

465
00:17:35,430 --> 00:17:34,160
flight magazine hi thank you um

466
00:17:37,590 --> 00:17:35,440
you did a

467
00:17:39,270 --> 00:17:37,600
survey of the

468
00:17:40,549 --> 00:17:39,280
exterior

469
00:17:41,990 --> 00:17:40,559
of dragon i wonder if you could tell us

470
00:17:45,270 --> 00:17:42,000
a little bit about the results of that

471
00:17:50,710 --> 00:17:47,909
okay well we only finished it up just in

472
00:17:52,870 --> 00:17:50,720
the last 24 to 36 hours so the results

473
00:17:54,950 --> 00:17:52,880
are very preliminary but overall very

474
00:17:58,310 --> 00:17:54,960
positive one of the primary goals of the

475
00:18:00,070 --> 00:17:58,320
survey uh was to ensure again that all

476
00:18:02,470 --> 00:18:00,080
of the the models in the analysis

477
00:18:05,270 --> 00:18:02,480
performed on the ground uh really

478
00:18:07,830 --> 00:18:05,280
matched the on-orbit uh

479
00:18:09,750 --> 00:18:07,840
configuration of the dragon

480
00:18:11,830 --> 00:18:09,760
downstream flights we're going to do

481
00:18:13,750 --> 00:18:11,840
robotics where we go out

482
00:18:15,270 --> 00:18:13,760
into the trunk so we take our robotic

483
00:18:17,350 --> 00:18:15,280
arm and we put

484
00:18:18,950 --> 00:18:17,360
dexter so the

485
00:18:20,630 --> 00:18:18,960
spdm

486
00:18:23,190 --> 00:18:20,640
on the end of the arm and can reach

487
00:18:25,750 --> 00:18:23,200
around in the trunk and and grab

488
00:18:27,110 --> 00:18:25,760

different payloads that spacex brings to

489
00:18:28,470 --> 00:18:27,120
the station

490
00:18:29,990 --> 00:18:28,480
that activity

491
00:18:31,430 --> 00:18:30,000
is done what we call kind of in the

492
00:18:33,830 --> 00:18:31,440
blind where you're reaching around on

493
00:18:36,470 --> 00:18:33,840
the back back side the crew doesn't have

494
00:18:38,549 --> 00:18:36,480
a good physical view out of the cupola

495
00:18:40,630 --> 00:18:38,559
windows we use cameras and so it's

496
00:18:42,789 --> 00:18:40,640
really important that all of the models

497
00:18:44,390 --> 00:18:42,799
are accurate in terms of all of the

498
00:18:46,789 --> 00:18:44,400
clearances

499
00:18:48,549 --> 00:18:46,799
to put the arm into the trunk pull the

500
00:18:50,390 --> 00:18:48,559
payload out of the trunk

501
00:18:52,070 --> 00:18:50,400
put payloads back into the trunk so that

502
00:18:54,230 --> 00:18:52,080
was really the biggest goal the results

503
00:18:56,150 --> 00:18:54,240
were very positive they need to take all

504
00:18:57,430 --> 00:18:56,160
that data and go match it in detail to

505
00:18:59,909 --> 00:18:57,440
all of the

506
00:19:02,310 --> 00:18:59,919
the computerized models the other goal

507
00:19:04,789 --> 00:19:02,320
was really to just get a general

508
00:19:06,150 --> 00:19:04,799
understanding of of how well the dragon

509
00:19:07,990 --> 00:19:06,160
had performed

510
00:19:10,470 --> 00:19:08,000
take a look at the solar arrays look to

511
00:19:12,549 --> 00:19:10,480
make sure on the trip to space station

512
00:19:13,669 --> 00:19:12,559
there was no damage that might cause a

513
00:19:15,590 --> 00:19:13,679

problem when

514
00:19:18,070 --> 00:19:15,600
re-entering re-entry happens here

515
00:19:19,909 --> 00:19:18,080
shortly and again all of that was very

516
00:19:22,070 --> 00:19:19,919
positive there wasn't anything

517
00:19:23,350 --> 00:19:22,080
specifically identified that could

518
00:19:25,029 --> 00:19:23,360
cause a problem although i know

519
00:19:27,750 --> 00:19:25,039
everybody's still pouring through that

520
00:19:29,750 --> 00:19:27,760
data in in great detail but the initial

521
00:19:31,350 --> 00:19:29,760
thought is that the dragon really looked

522
00:19:35,350 --> 00:19:31,360
great

523
00:19:37,830 --> 00:19:35,360
for john could you describe the size of

524
00:19:40,390 --> 00:19:37,840
your spacex team mission control team

525
00:19:42,390 --> 00:19:40,400
please and i guess you work 24 hours a

526
00:19:45,029 --> 00:19:42,400
day

527
00:19:47,669 --> 00:19:45,039
uh that's correct we have uh four total

528
00:19:50,150 --> 00:19:47,679
shifts uh usually it's three working

529
00:19:51,990 --> 00:19:50,160
eight hour shifts uh each shift

530
00:19:53,830 --> 00:19:52,000
depending on what phase of flight can

531
00:19:57,270 --> 00:19:53,840
flex anywhere from four people on

532
00:19:59,750 --> 00:19:57,280
console up to the 24 seats that we have

533
00:20:01,430 --> 00:19:59,760
there now of those 24

534
00:20:03,669 --> 00:20:01,440
some of those are

535
00:20:06,230 --> 00:20:03,679
roles like safety and mission assurance

536
00:20:08,870 --> 00:20:06,240
and quality control the main operators

537
00:20:11,270 --> 00:20:08,880
probably take up about 15 to at a

538
00:20:13,350 --> 00:20:11,280

maximum of 17 operators and those

539
00:20:15,909 --> 00:20:13,360
include some very specialized roles for

540
00:20:17,430 --> 00:20:15,919
this one test flight we want to be

541
00:20:19,830 --> 00:20:17,440
making sure we had the experts in the

542
00:20:22,870 --> 00:20:19,840
room in case we had any any items we

543
00:20:25,350 --> 00:20:22,880
want to look at and uh for future

544
00:20:27,110 --> 00:20:25,360
follow-on missions crs missions the team

545
00:20:30,470 --> 00:20:27,120
would generally go from

546
00:20:32,950 --> 00:20:30,480
four operators during uh low times such

547
00:20:34,710 --> 00:20:32,960
as far field rendezvous or even birth

548
00:20:36,630 --> 00:20:34,720
operations getting down to two crew

549
00:20:38,789 --> 00:20:36,640
members uh and then all the way up

550
00:20:40,710 --> 00:20:38,799
during rendezvous ops uh between eight

551
00:20:42,950 --> 00:20:40,720
and twelve

552
00:20:45,669 --> 00:20:42,960
all right and um i just wondered too if

553
00:20:47,190 --> 00:20:45,679
you had a chance i asked this earlier uh

554
00:20:50,710 --> 00:20:47,200
to take a picture with all six crew

555
00:20:52,710 --> 00:20:50,720
members together in the dragon thanks

556
00:20:54,390 --> 00:20:52,720
oh

557
00:20:55,750 --> 00:20:54,400
well let's see so i'm pretty sure

558
00:20:58,149 --> 00:20:55,760
there's a picture with three crew

559
00:20:59,909 --> 00:20:58,159
members in there i haven't seen one yet

560
00:21:01,990 --> 00:20:59,919
with all six we'll check and see if

561
00:21:05,270 --> 00:21:02,000
there is one you know the the dragon is

562
00:21:07,190 --> 00:21:05,280
uh with the cargo in there not really uh

563
00:21:08,950 --> 00:21:07,200

enough space for for six of them to be

564
00:21:10,630 --> 00:21:08,960
in there comfortably that doesn't mean

565
00:21:12,310 --> 00:21:10,640
they haven't given it a try but i

566
00:21:14,830 --> 00:21:12,320
haven't seen a picture yet so at least

567
00:21:16,710 --> 00:21:14,840
so far the only one i i have seen is

568
00:21:18,470 --> 00:21:16,720
three thank you

569
00:21:23,830 --> 00:21:18,480
okay thanks again let's go to uh roger

570
00:21:25,430 --> 00:21:24,630
thank you

571
00:21:27,750 --> 00:21:25,440
uh

572
00:21:29,350 --> 00:21:27,760
good morning to you um

573
00:21:30,710 --> 00:21:29,360
first of all a question for holly and

574
00:21:31,510 --> 00:21:30,720
then i'd like to follow up with one for

575
00:21:34,310 --> 00:21:31,520
john

576
00:21:37,510 --> 00:21:34,320
the when you had a look at the outside

577
00:21:39,350 --> 00:21:37,520
of the dragon did the survey you had to

578
00:21:41,110 --> 00:21:39,360
look inside the trunk i presume that you

579
00:21:43,510 --> 00:21:41,120
didn't come across any anomalies that

580
00:21:47,350 --> 00:21:43,520
would cause problems recovering

581
00:21:51,029 --> 00:21:48,870
so certainly from our perspective there

582
00:21:54,789 --> 00:21:51,039
were not any anomalies and and just to

583
00:21:57,750 --> 00:21:54,799
clarify for this mission nasa did not

584
00:22:00,310 --> 00:21:57,760
put external cargo in the trunk that's

585
00:22:02,149 --> 00:22:00,320
planned for a follow-on mission

586
00:22:03,909 --> 00:22:02,159
several flights downstream from now but

587
00:22:05,270 --> 00:22:03,919
this was really all the preparation work

588
00:22:10,470 --> 00:22:05,280

to make that

589
00:22:15,909 --> 00:22:13,190
right thank you and uh a follow-up

590
00:22:19,350 --> 00:22:15,919
question for john the recovery vessel uh

591
00:22:21,750 --> 00:22:19,360
is this a spacex vessel uh what size is

592
00:22:23,029 --> 00:22:21,760
it and what sort of weather constraints

593
00:22:24,950 --> 00:22:23,039
do you have

594
00:22:26,789 --> 00:22:24,960
for recovering

595
00:22:29,909 --> 00:22:26,799
a dragon

596
00:22:34,870 --> 00:22:32,630
certainly so uh spacex contracts with a

597
00:22:36,549 --> 00:22:34,880
commercial provider for the recovery

598
00:22:38,789 --> 00:22:36,559
vessels and that allows us to have a lot

599
00:22:40,630 --> 00:22:38,799
of flexibility in case we need to call

600
00:22:42,870 --> 00:22:40,640
up a different vessel because of

601
00:22:45,270 --> 00:22:42,880
scheduling concerns

602
00:22:47,909 --> 00:22:45,280
the operators that we use normally

603
00:22:48,950 --> 00:22:47,919
operate a vessel in about the 140 foot

604
00:22:50,950 --> 00:22:48,960
range

605
00:22:52,310 --> 00:22:50,960
and then supporting vessels are slightly

606
00:22:53,510 --> 00:22:52,320
smaller than that

607
00:22:56,549 --> 00:22:53,520
and

608
00:22:58,870 --> 00:22:56,559
the vessels are meant for oceanic

609
00:23:00,310 --> 00:22:58,880
voyages and so forth so they uh they

610
00:23:02,870 --> 00:23:00,320
have very high

611
00:23:05,350 --> 00:23:02,880
uh sea state constraints and our

612
00:23:08,070 --> 00:23:05,360
recovery constraints are about to put in

613
00:23:10,870 --> 00:23:08,080

terms of past programs slightly higher

614
00:23:13,110 --> 00:23:10,880
than the apollo sea state constraints

615
00:23:16,070 --> 00:23:13,120
and right now weather is looking great

616
00:23:18,230 --> 00:23:16,080
through forecast to be great through the

617
00:23:24,149 --> 00:23:18,240
recovery time plus some margin for the

618
00:23:28,870 --> 00:23:26,390
okay i think that's it from roger uh

619
00:23:30,950 --> 00:23:28,880
let's go to clara moscow with space.com

620
00:23:32,390 --> 00:23:30,960
thanks very much yes huh i'm wondering

621
00:23:33,750 --> 00:23:32,400
if you can tell me

622
00:23:35,669 --> 00:23:33,760
if there's any chance at all that the

623
00:23:38,870 --> 00:23:35,679
space station crew will be able to see

624
00:23:40,630 --> 00:23:38,880
re-entry uh from from orbit and also uh

625
00:23:43,110 --> 00:23:40,640
if dragon is going to be flying over any

626
00:23:44,870 --> 00:23:43,120
parts of the land in in pre-dawn or

627
00:23:47,110 --> 00:23:44,880
darkness where people on the ground

628
00:23:48,789 --> 00:23:47,120
could see it

629
00:23:49,830 --> 00:23:48,799
okay well i'll take the first part i

630
00:23:51,990 --> 00:23:49,840
actually just talked to the space

631
00:23:54,149 --> 00:23:52,000
station crew this morning we were doing

632
00:23:56,390 --> 00:23:54,159
our last robotics training session and

633
00:23:57,510 --> 00:23:56,400
after that we had a little uh debrief

634
00:23:59,510 --> 00:23:57,520
and one of the things we talked about

635
00:24:02,230 --> 00:23:59,520
was potentially trying to see dragons so

636
00:24:03,430 --> 00:24:02,240
the release time itself right now is in

637
00:24:05,669 --> 00:24:03,440
the dark

638
00:24:08,630 --> 00:24:05,679

however what they can really see is is a

639
00:24:10,710 --> 00:24:08,640
plasma trail and so

640
00:24:12,630 --> 00:24:10,720
if you plot out the time of the plasma

641
00:24:14,070 --> 00:24:12,640
trail it's in the daylight which will

642
00:24:15,269 --> 00:24:14,080
make it pretty hard for them to see

643
00:24:17,269 --> 00:24:15,279
although i will tell you in the control

644
00:24:18,630 --> 00:24:17,279
center right now they're sending up the

645
00:24:19,990 --> 00:24:18,640
information to the crew so they know

646
00:24:22,310 --> 00:24:20,000
where to look just in the off chance

647
00:24:24,230 --> 00:24:22,320
they can see it although we think it's

648
00:24:27,909 --> 00:24:24,240
unfortunately pretty unlikely just

649
00:24:34,870 --> 00:24:30,549
okay thanks

650
00:24:39,110 --> 00:24:36,950
hi um thanks very much i have a couple

651
00:24:41,430 --> 00:24:39,120
questions first a quick follow-up to

652
00:24:43,029 --> 00:24:41,440
john on one of the previous questions is

653
00:24:47,190 --> 00:24:43,039
what's the name of the company that's

654
00:24:52,230 --> 00:24:49,990
ah certainly it's uh american marine out

655
00:24:55,590 --> 00:24:52,240
of los angeles

656
00:24:57,669 --> 00:24:55,600
thanks and um for holly um

657
00:25:00,950 --> 00:24:57,679
how important is it uh do you think for

658
00:25:04,549 --> 00:25:00,960
nasa to get a big return load since it's

659
00:25:07,750 --> 00:25:04,559
been nearly a year since uh the station

660
00:25:09,830 --> 00:25:07,760
programs had this capability

661
00:25:11,590 --> 00:25:09,840
well in terms of return cargo because

662
00:25:13,269 --> 00:25:11,600
this is the test flight

663
00:25:16,070 --> 00:25:13,279

specifically

664
00:25:17,110 --> 00:25:16,080
the program made sure that there's not

665
00:25:18,789 --> 00:25:17,120
anything

666
00:25:20,310 --> 00:25:18,799
coming home that

667
00:25:22,789 --> 00:25:20,320
we couldn't afford to not get back

668
00:25:24,630 --> 00:25:22,799
certainly that is not the plan uh john's

669
00:25:26,549 --> 00:25:24,640
team is going to have a great re-entry

670
00:25:27,510 --> 00:25:26,559
and splashdown but we didn't put any

671
00:25:28,549 --> 00:25:27,520
critical

672
00:25:30,310 --> 00:25:28,559
cargo

673
00:25:31,590 --> 00:25:30,320
on the return manifest you know that

674
00:25:33,669 --> 00:25:31,600
being said i know it's a really

675
00:25:34,950 --> 00:25:33,679
important capability

676
00:25:37,669 --> 00:25:34,960
to prove

677
00:25:39,909 --> 00:25:37,679
for nasa and for the space station

678
00:25:41,909 --> 00:25:39,919
program as as we go forward

679
00:25:45,830 --> 00:25:41,919
since this vehicle has the unique

680
00:25:49,909 --> 00:25:47,830
thanks and the last question i had is um

681
00:25:52,070 --> 00:25:49,919
i assume the surprise is over now can

682
00:25:54,789 --> 00:25:52,080
either of you

683
00:25:57,190 --> 00:25:54,799
tell us what was a board dragon for the

684
00:26:00,630 --> 00:25:57,200
crew just kind of the care packages

685
00:26:03,909 --> 00:26:02,230
let's see so i i talked to them this

686
00:26:05,510 --> 00:26:03,919
morning but i actually didn't ask them

687
00:26:09,029 --> 00:26:05,520
that question so i don't know john d do

688
00:26:12,390 --> 00:26:10,310

actually i was going to defer to you

689
00:26:15,029 --> 00:26:12,400
holly on that one so i don't have that

690
00:26:17,350 --> 00:26:15,039
information either yeah so so generally

691
00:26:19,029 --> 00:26:17,360
you know we they we keep it private and

692
00:26:20,950 --> 00:26:19,039
and we don't really uh we don't really

693
00:26:22,470 --> 00:26:20,960
delve into their their care packages

694
00:26:25,590 --> 00:26:22,480
that's kind of what makes them special

695
00:26:28,230 --> 00:26:25,600
so i i didn't actually ask them and and

696
00:26:29,750 --> 00:26:28,240
don't know the answer for you

697
00:26:31,750 --> 00:26:29,760
oh thanks uh

698
00:26:33,669 --> 00:26:31,760
gwen chodwell had said uh before launch

699
00:26:36,070 --> 00:26:33,679
that they had asked for apples that they

700
00:26:36,870 --> 00:26:36,080
decided not to include them because of

701
00:26:38,149 --> 00:26:36,880
uh

702
00:26:39,909 --> 00:26:38,159
you know that they didn't want him to

703
00:26:41,590 --> 00:26:39,919
rot in between so just you know was

704
00:26:44,230 --> 00:26:41,600
curious if there was anything like that

705
00:26:45,669 --> 00:26:44,240
but that's fine thank you

706
00:26:47,750 --> 00:26:45,679
okay thanks irene let's go to marcia

707
00:26:50,070 --> 00:26:47,760
down with cecilia press

708
00:26:52,789 --> 00:26:50,080
yes hi this is uh marcia dunn with a

709
00:26:54,950 --> 00:26:52,799
couple of questions for john is this

710
00:26:59,830 --> 00:26:54,960
spacecraft in particular

711
00:27:04,230 --> 00:27:00,789
okay

712
00:27:06,230 --> 00:27:04,240
nasa has contracted all new dragons for

713
00:27:08,950 --> 00:27:06,240

both the cots commercial orbital

714
00:27:12,070 --> 00:27:08,960
transportation services and the crew

715
00:27:14,230 --> 00:27:12,080
resupply or crs missions so this vessel

716
00:27:16,789 --> 00:27:14,240
and then the 12 follow-on spacecraft

717
00:27:19,029 --> 00:27:16,799
will all be new builds we do have the

718
00:27:21,750 --> 00:27:19,039
capability to refurbish and re-fly

719
00:27:23,830 --> 00:27:21,760
dragons both to other destinations so if

720
00:27:26,310 --> 00:27:23,840
there is a commercial uh desire either

721
00:27:27,750 --> 00:27:26,320
to go to a different space station or

722
00:27:30,230 --> 00:27:27,760
for uh

723
00:27:32,149 --> 00:27:30,240
eventual crew carrying a capability we

724
00:27:34,389 --> 00:27:32,159
could look to refurbish these capsules

725
00:27:36,870 --> 00:27:34,399
and also we have a vehicle called dragon

726
00:27:38,549 --> 00:27:36,880
lab which is a long-term free flyer

727
00:27:40,470 --> 00:27:38,559
where we can fly experiments up to two

728
00:27:42,310 --> 00:27:40,480
years on orbit that do not go to the

729
00:27:44,230 --> 00:27:42,320
international space station and we may

730
00:27:46,630 --> 00:27:44,240
refurbish these capsules to fulfill that

731
00:27:50,470 --> 00:27:48,470
a couple more questions then what will

732
00:27:54,870 --> 00:27:50,480
happen to this dragon in particular will

733
00:28:00,630 --> 00:27:57,750
use it for parts

734
00:28:03,110 --> 00:28:00,640
uh i don't have that information but i

735
00:28:05,430 --> 00:28:03,120
uh it will definitely be on display for

736
00:28:07,830 --> 00:28:05,440
its history making a history making

737
00:28:09,830 --> 00:28:07,840
aspect of this mission

738
00:28:11,190 --> 00:28:09,840

my last question for you is how would

739
00:28:13,269 --> 00:28:11,200
you measure

740
00:28:15,350 --> 00:28:13,279
this mission

741
00:28:16,630 --> 00:28:15,360
if you don't get the dragon back the way

742
00:28:18,389 --> 00:28:16,640
you hope

743
00:28:20,470 --> 00:28:18,399
how will you how would you assess the

744
00:28:21,430 --> 00:28:20,480
mission then up to this day if

745
00:28:24,710 --> 00:28:21,440
everything

746
00:28:26,549 --> 00:28:24,720
goes well tomorrow and if it does not

747
00:28:29,430 --> 00:28:26,559
so first of all it was a major success

748
00:28:32,310 --> 00:28:29,440
for us uh the ability to first combine

749
00:28:35,029 --> 00:28:32,320
the c2 and c3 missions and

750
00:28:37,909 --> 00:28:35,039
the trust and hard work that nasa helped

751
00:28:39,909 --> 00:28:37,919
spacex with were really important and

752
00:28:41,830 --> 00:28:39,919
the ability to get to space station on

753
00:28:44,149 --> 00:28:41,840
our first time to

754
00:28:46,710 --> 00:28:44,159
not only rendezvous but then to birth

755
00:28:49,269 --> 00:28:46,720
transfer cargo and depart safely are

756
00:28:51,510 --> 00:28:49,279
major mission objectives and we would

757
00:28:53,669 --> 00:28:51,520
call that mission alone a success

758
00:28:55,909 --> 00:28:53,679
every other spacecraft short of soyuz

759
00:28:58,149 --> 00:28:55,919
fulfills that exact role where it

760
00:29:00,789 --> 00:28:58,159
delivers cargo and then has a

761
00:29:03,269 --> 00:29:00,799
destructive reentry we're hopeful again

762
00:29:04,950 --> 00:29:03,279
it's a major challenge tomorrow that we

763
00:29:07,430 --> 00:29:04,960

feel we're ready for

764
00:29:09,590 --> 00:29:07,440
to perform re-entry but regardless this

765
00:29:12,310 --> 00:29:09,600
c2 plus mission has been a major success

766
00:29:13,510 --> 00:29:12,320
for spacex and for nasa thank you very

767
00:29:15,110 --> 00:29:13,520
much

768
00:29:19,029 --> 00:29:15,120
all right thanks marcia

769
00:29:23,269 --> 00:29:21,110
thank you a couple questions for john

770
00:29:25,669 --> 00:29:23,279
john could you describe the the heating

771
00:29:27,669 --> 00:29:25,679
and g-forces dragon will experience

772
00:29:29,269 --> 00:29:27,679
during reentry and possibly compare that

773
00:29:31,350 --> 00:29:29,279
to any other

774
00:29:33,750 --> 00:29:31,360
vehicles that have re-entered and and

775
00:29:35,750 --> 00:29:33,760
would it is it the same profile as if

776
00:29:38,470 --> 00:29:35,760
you would you you would anticipate if

777
00:29:40,070 --> 00:29:38,480
you were flying people

778
00:29:42,789 --> 00:29:40,080
it is the same profile that we would

779
00:29:44,230 --> 00:29:42,799
anticipate flying uh were we carrying

780
00:29:46,549 --> 00:29:44,240
crew from the international space

781
00:29:49,350 --> 00:29:46,559
station instead of cargo

782
00:29:52,389 --> 00:29:49,360
uh right now because of the inclination

783
00:29:54,710 --> 00:29:52,399
and the iss attitude altitude this

784
00:29:57,750 --> 00:29:54,720
reentry profile will be similar to the

785
00:30:01,029 --> 00:29:57,760
c1 profile that we already flew and we

786
00:30:03,029 --> 00:30:01,039
saw very very strong results on dragon

787
00:30:05,990 --> 00:30:03,039
so we don't anticipate anything uh

788
00:30:08,710 --> 00:30:06,000

atypical from that with standard heating

789
00:30:09,909 --> 00:30:08,720
again similar to most vehicles that have

790
00:30:12,549 --> 00:30:09,919
re-entered

791
00:30:14,470 --> 00:30:12,559
including shuttle with the exception of

792
00:30:17,029 --> 00:30:14,480
some some variations on shuttle's

793
00:30:18,950 --> 00:30:17,039
profile but again very standard for the

794
00:30:21,190 --> 00:30:18,960
inclination and altitude of space

795
00:30:22,470 --> 00:30:21,200
station

796
00:30:24,789 --> 00:30:22,480
so so that would be

797
00:30:28,230 --> 00:30:24,799
perhaps up to about 3000 degrees that

798
00:30:31,830 --> 00:30:29,669
i'd actually have to get you that number

799
00:30:34,950 --> 00:30:31,840
i don't recall offhand but that does

800
00:30:36,950 --> 00:30:34,960
sound uh roughly correct and as well as

801
00:30:39,029 --> 00:30:36,960
gs that are well within the crew limits

802
00:30:40,870 --> 00:30:39,039
again the cargo version dragon is

803
00:30:42,870 --> 00:30:40,880
designed to fulfill as many crew

804
00:30:46,149 --> 00:30:42,880
carrying capabilities as possible and

805
00:30:47,990 --> 00:30:46,159
that includes the g profile

806
00:30:50,630 --> 00:30:48,000
thanks and i was wondering if you could

807
00:30:52,149 --> 00:30:50,640
possibly just explain a little more why

808
00:30:54,070 --> 00:30:52,159
given the different

809
00:30:56,710 --> 00:30:54,080
factors you want you wanted to optimize

810
00:31:00,070 --> 00:30:56,720
why tomorrow is the best

811
00:31:01,909 --> 00:31:00,080
reentry day for you and then finally

812
00:31:05,750 --> 00:31:01,919
when do you expect the next dragon to

813
00:31:08,310 --> 00:31:05,760

ship to the cape and be ready for flight

814
00:31:09,990 --> 00:31:08,320
certainly uh the reason why tomorrow is

815
00:31:11,509 --> 00:31:10,000
optimal for us is it gives us the

816
00:31:13,830 --> 00:31:11,519
maximum amount of daylight in the

817
00:31:16,870 --> 00:31:13,840
recovery zone so that gives the recovery

818
00:31:18,389 --> 00:31:16,880
crew a great opportunity to get dragon

819
00:31:21,110 --> 00:31:18,399
on board the vessel as quickly as

820
00:31:23,110 --> 00:31:21,120
possible also in the morning hours we

821
00:31:25,350 --> 00:31:23,120
expect sea states to be a little bit

822
00:31:27,269 --> 00:31:25,360
lower than they are as the day goes on

823
00:31:28,389 --> 00:31:27,279
so this is really a prime opportunity

824
00:31:31,110 --> 00:31:28,399
for us

825
00:31:34,389 --> 00:31:31,120
and i'm sorry your second question

826
00:31:36,789 --> 00:31:34,399
when will the next dragon to fly do you

827
00:31:38,789 --> 00:31:36,799
understand the falcon 9 is is already at

828
00:31:42,710 --> 00:31:38,799
the cape when will the dragon be shipped

829
00:31:45,110 --> 00:31:42,720
and and be ready to go for crs one

830
00:31:46,549 --> 00:31:45,120
yes that's correct uh falcon 9 is at the

831
00:31:48,950 --> 00:31:46,559
cape and it looks great right now in

832
00:31:51,590 --> 00:31:48,960
fact it's uh it's completing checkouts

833
00:31:54,149 --> 00:31:51,600
at the cape for the next mission uh the

834
00:31:55,990 --> 00:31:54,159
dragon is uh for crs one is here in

835
00:32:02,310 --> 00:31:56,000
hawthorne right now and we expect that

836
00:32:05,990 --> 00:32:04,389
okay thanks james let's go to charles

837
00:32:08,149 --> 00:32:06,000
atkinson

838
00:32:10,310 --> 00:32:08,159

good morning charles action examiner.com

839
00:32:13,990 --> 00:32:10,320
holly what key test does nasa have

840
00:32:15,509 --> 00:32:14,000
planned for dragon following unbirthing

841
00:32:17,830 --> 00:32:15,519
and the question was which what key

842
00:32:20,710 --> 00:32:17,840
tests was that the question

843
00:32:23,430 --> 00:32:20,720
yes does nasa have any new or key tests

844
00:32:25,430 --> 00:32:23,440
that they want to try uh prior to

845
00:32:27,590 --> 00:32:25,440
re-entry for dragon

846
00:32:29,830 --> 00:32:27,600
we actually have already completed all

847
00:32:32,630 --> 00:32:29,840
of what we called our demonstrations or

848
00:32:33,430 --> 00:32:32,640
as you termed them key tests they were

849
00:32:35,669 --> 00:32:33,440
really

850
00:32:37,669 --> 00:32:35,679
playing for the fly ender and then

851
00:32:39,909 --> 00:32:37,679
on rendezvous day

852
00:32:42,470 --> 00:32:39,919
obviously the the cargo transfer was a

853
00:32:44,950 --> 00:32:42,480
key test in terms of fulfilling

854
00:32:45,909 --> 00:32:44,960
dragon's capability to transfer cargo

855
00:32:47,190 --> 00:32:45,919
and so

856
00:32:48,470 --> 00:32:47,200
once we

857
00:32:50,149 --> 00:32:48,480
do the release

858
00:32:52,230 --> 00:32:50,159
from the robotic arm and then as i

859
00:32:54,230 --> 00:32:52,240
mentioned earlier the dragon does its

860
00:32:56,070 --> 00:32:54,240
departure sequence it's it's three burns

861
00:32:57,590 --> 00:32:56,080
out of the approach ellipsoid we don't

862
00:33:00,310 --> 00:32:57,600
have anything else planned for this

863
00:33:02,630 --> 00:33:00,320

mission i know that the the team will be

864
00:33:03,909 --> 00:33:02,640
gathering a lot of data because a lot of

865
00:33:06,549 --> 00:33:03,919
the

866
00:33:08,149 --> 00:33:06,559
sensors and systems on dragon will be

867
00:33:09,990 --> 00:33:08,159
used again as it was during the

868
00:33:12,149 --> 00:33:10,000
rendezvous sequence but we've actually

869
00:33:14,149 --> 00:33:12,159
already completed all of our key tests

870
00:33:15,830 --> 00:33:14,159
for the flight

871
00:33:17,990 --> 00:33:15,840
thank you holly and john i've got a

872
00:33:19,830 --> 00:33:18,000
couple real quick how is dragon's fuel

873
00:33:22,549 --> 00:33:19,840
levels following its extended approach

874
00:33:27,190 --> 00:33:24,549
so dragon is looking uh very good we're

875
00:33:29,590 --> 00:33:27,200
above our margins for a nominal re-entry

876
00:33:31,509 --> 00:33:29,600
and uh we're tracking closely uh with

877
00:33:33,350 --> 00:33:31,519
holly's group for uh release but we're

878
00:33:35,269 --> 00:33:33,360
still above our minimums and above our

879
00:33:37,750 --> 00:33:35,279
profile

880
00:33:41,190 --> 00:33:37,760
okay uh what is the name of the recovery

881
00:33:45,029 --> 00:33:43,190
i don't have that information we have a

882
00:33:46,470 --> 00:33:45,039
number of vessels that we work with but

883
00:33:47,509 --> 00:33:46,480
we can get that to you later if you'd

884
00:33:48,870 --> 00:33:47,519
like

885
00:33:51,190 --> 00:33:48,880
okay that'd be great and then one last

886
00:33:53,430 --> 00:33:51,200
one thank you uh will spacex ever

887
00:33:56,389 --> 00:33:53,440
consider naming future dragons with a

888
00:34:01,190 --> 00:33:58,710

that question you'd have to ask elon so

889
00:34:03,750 --> 00:34:01,200
i can check with him but um

890
00:34:06,070 --> 00:34:03,760
right now this dragon is a c2 plus

891
00:34:09,990 --> 00:34:06,080
vehicle and the next vehicle to fly

892
00:34:12,790 --> 00:34:10,000
dragon 3 is uh is is going to be

893
00:34:14,710 --> 00:34:12,800
fulfilling the crs one role

894
00:34:16,550 --> 00:34:14,720
okay thanks john congratulations on a

895
00:34:19,349 --> 00:34:16,560
great flight

896
00:34:21,190 --> 00:34:19,359
thank you i really appreciate it

897
00:34:29,109 --> 00:34:21,200
okay i think that is all any follow-ups

898
00:34:33,510 --> 00:34:31,349
thanks again mark caro for aviation week

899
00:34:36,149 --> 00:34:33,520
i i wondered about the

900
00:34:37,669 --> 00:34:36,159
the early cargo that will be taken from

901
00:34:39,829 --> 00:34:37,679
dragon

902
00:34:41,589 --> 00:34:39,839
and and presented to nasa i guess in the

903
00:34:43,510 --> 00:34:41,599
los angeles area

904
00:34:46,470 --> 00:34:43,520
is any of that some of the medical

905
00:34:48,149 --> 00:34:46,480
specimens that have been accumulating

906
00:34:50,310 --> 00:34:48,159
on the space station or is there some

907
00:34:52,069 --> 00:34:50,320
way you can sort of describe the nature

908
00:34:54,389 --> 00:34:52,079
of what's

909
00:34:56,790 --> 00:34:54,399
early material to get or is it simply

910
00:34:59,990 --> 00:34:56,800
just demo stuff that

911
00:35:02,390 --> 00:35:01,270
okay well

912
00:35:04,069 --> 00:35:02,400
probably would be better to get you the

913
00:35:07,349 --> 00:35:04,079

specifics off of the manifest from what

914
00:35:09,349 --> 00:35:07,359
i can remember looking at it yesterday

915
00:35:11,670 --> 00:35:09,359
we went into dragon and took some

916
00:35:13,589 --> 00:35:11,680
samples of the environment grab sample

917
00:35:17,109 --> 00:35:13,599
as an example and so that's one of the

918
00:35:18,390 --> 00:35:17,119
early dsto items so that

919
00:35:20,150 --> 00:35:18,400
the team on the ground can start

920
00:35:22,230 --> 00:35:20,160
analyzing that immediately and make sure

921
00:35:25,109 --> 00:35:22,240
everything was as we expected and in

922
00:35:26,470 --> 00:35:25,119
terms of of medical samples i think it'd

923
00:35:29,670 --> 00:35:26,480
be better if we check the manifest and

924
00:35:31,589 --> 00:35:29,680
then we'll get you that information

925
00:35:33,589 --> 00:35:31,599
okay i think that's it let's take a look

926
00:35:36,150 --> 00:35:33,599
at our programming coming up uh early

927
00:35:38,150 --> 00:35:36,160
tomorrow morning here on nasa television

928
00:35:40,150 --> 00:35:38,160
uh we'll have the iss update later on

929
00:35:41,829 --> 00:35:40,160
today at 10 o'clock central time 11

930
00:35:43,190 --> 00:35:41,839
o'clock eastern time

931
00:35:44,550 --> 00:35:43,200
and as you heard holly talk about the

932
00:35:46,390 --> 00:35:44,560
crew is going to wake up

933
00:35:49,190 --> 00:35:46,400
bright and early later on tonight at 11

934
00:35:52,390 --> 00:35:49,200
p.m central time uh midnight eastern

935
00:35:54,630 --> 00:35:52,400
time our coverage will begin at 1 30 a.m

936
00:35:56,630 --> 00:35:54,640
central time with the

937
00:35:58,470 --> 00:35:56,640
unbirthing of the dragon spacecraft from

938
00:36:02,069 --> 00:35:58,480

the international space station that

939
00:36:04,390 --> 00:36:02,079
time right now set for 305 a.m central

940
00:36:06,710 --> 00:36:04,400
time for the robotic arm to

941
00:36:08,310 --> 00:36:06,720
detach dragon from the space station and

942
00:36:12,310 --> 00:36:08,320
then the actual release will take place

943
00:36:13,829 --> 00:36:12,320
at 4 35 a.m central time 5 35 a.m

944
00:36:15,829 --> 00:36:13,839
eastern time

945
00:36:18,150 --> 00:36:15,839
we'll have another edition of iss update

946
00:36:20,710 --> 00:36:18,160
early tomorrow morning at 8 00 a.m

947
00:36:22,790 --> 00:36:20,720
central time 9 00 a.m eastern time and

948
00:36:25,910 --> 00:36:22,800
then our live coverage will continue at

949
00:36:27,910 --> 00:36:25,920
9 15 a.m central time for the deorbit

950
00:36:30,630 --> 00:36:27,920
and splashdown coverage right now the

951
00:36:32,310 --> 00:36:30,640
de-orbit burn is scheduled for 9 51 a.m

952
00:36:34,230 --> 00:36:32,320
central time which of course would be uh

953
00:36:37,109 --> 00:36:34,240
10 51 a.m eastern

954
00:36:41,750 --> 00:36:37,119
and then the splashdown targeted for 10

955
00:36:43,349 --> 00:36:41,760
44 a.m central time 11 44 a.m eastern

956
00:36:45,030 --> 00:36:43,359
time and then we'll have our final

957
00:36:47,910 --> 00:36:45,040
mission status briefing from here in

958
00:36:49,349 --> 00:36:47,920
houston and also in hawthorne at 1pm

959
00:36:52,069 --> 00:36:49,359
central time

960
00:36:54,230 --> 00:36:52,079
2 p.m eastern time so please join us

961
00:36:56,230 --> 00:36:54,240
tomorrow for the conclusion of this

962
00:36:57,670 --> 00:36:56,240
historic mission and of course for all

963
00:37:03,030 --> 00:36:57,680

the latest information just log on to

964
00:37:08,310 --> 00:37:06,550
spacex or slash station iss update is up