1
00:00:08,950 --> 00:00:07,190
good morning and welcome to nasa's jet

2
00:00:11,430 --> 00:00:08,960
propulsion laboratory in pasadena

3
00:00:13,749 --> 00:00:11,440
california i'm veronica mcgregor we are

4
00:00:15,669 --> 00:00:13,759
here for the final pre-landing news

5
00:00:18,630 --> 00:00:15,679
conference to discuss the landing of the

6
00:00:21,750 --> 00:00:18,640
mars science laboratory curiosity rover

7
00:00:26,150 --> 00:00:21,760
scheduled for this evening at 10 31 pm

8
00:00:29,109 --> 00:00:26,160
pacific time 1 31 a.m eastern time just

9
00:00:30,630 --> 00:00:29,119
a little over 13 hours from now

10
00:00:33,510 --> 00:00:30,640
i'm going to introduce our panel to give

11
00:00:35,590 --> 00:00:33,520
you the final update on the status of

12
00:00:37,270 --> 00:00:35,600
the mission this morning joining us

13
00:00:39,190 --> 00:00:37,280

today we have

14
00:00:41,190 --> 00:00:39,200
doug mcquistion from nasa headquarters

15
00:00:43,590 --> 00:00:41,200
he's the mars exploration program

16
00:00:45,590 --> 00:00:43,600
director

17
00:00:47,270 --> 00:00:45,600
brian portock of the jet propulsion

18
00:00:50,790 --> 00:00:47,280
laboratory he's the

19
00:00:57,110 --> 00:00:53,350
thomas martin moore from jpl the

20
00:01:02,709 --> 00:01:00,069
and adam stelzner from jpl the entry

21
00:01:06,390 --> 00:01:02,719
descent and landing phase lead

22
00:01:10,550 --> 00:01:08,870
well it's a fine martian day we have

23
00:01:12,230 --> 00:01:10,560
sun's about ready to come up at gale

24
00:01:13,510 --> 00:01:12,240
crater it's going to be warm it's going

25
00:01:15,109 --> 00:01:13,520
to be sunny

26
00:01:17,350 --> 00:01:15,119
probably get a nice tan if you want to

27
00:01:18,630 --> 00:01:17,360
do that plenty of uv available so you'll

28
00:01:20,070 --> 00:01:18,640
hear more about the weather i think from

29
00:01:22,149 --> 00:01:20,080
adam

30
00:01:23,670 --> 00:01:22,159
msl is now feeling the effects of mars

31
00:01:25,429 --> 00:01:23,680
and i think

32
00:01:27,510 --> 00:01:25,439
maybe the team is i know i am feeling

33
00:01:30,630 --> 00:01:27,520
those effects as well

34
00:01:33,350 --> 00:01:30,640
we're uh to be exact 12 hours 59 minutes

35
00:01:35,910 --> 00:01:33,360
33 seconds from touchdown

36
00:01:37,749 --> 00:01:35,920
and about 112 000 miles to go

37
00:01:38,710 --> 00:01:37,759
accelerating all the way from this point

38
00:01:41,510 --> 00:01:38,720

on

39
00:01:43,270 --> 00:01:41,520
we're about to land a rover that is 10

40
00:01:45,990 --> 00:01:43,280
times heavier than spirit and

41
00:01:47,590 --> 00:01:46,000
opportunity with 15 times the payload

42
00:01:48,710 --> 00:01:47,600
pretty incredible feat we're about to

43
00:01:49,830 --> 00:01:48,720
attempt

44
00:01:52,069 --> 00:01:49,840
so

45
00:01:53,910 --> 00:01:52,079
we may not be successful

46
00:01:55,429 --> 00:01:53,920
what the what the outcome of this is

47
00:01:57,190 --> 00:01:55,439
we'll all know but one of the things i

48
00:02:00,310 --> 00:01:57,200
want to go back for all those inquiring

49
00:02:04,230 --> 00:02:02,550
is the communications information and

50
00:02:06,310 --> 00:02:04,240
how how will we know and what will you

51
00:02:07,429 --> 00:02:06,320
know when will we know it so at the very

52
00:02:10,550 --> 00:02:07,439
top level

53
00:02:13,910 --> 00:02:10,560
odyssey is our primary information path

54
00:02:16,869 --> 00:02:13,920
odyssey is going to roll the spacecraft

55
00:02:18,390 --> 00:02:16,879
a few minutes prior to msl entering the

56
00:02:20,309 --> 00:02:18,400
atmosphere

57
00:02:22,630 --> 00:02:20,319
it will as long as that maneuver is

58
00:02:23,830 --> 00:02:22,640
successful it will watch

59
00:02:26,150 --> 00:02:23,840
msl

60
00:02:28,790 --> 00:02:26,160
and curiosity all the way to the ground

61
00:02:31,030 --> 00:02:28,800
and a few seconds after

62
00:02:33,670 --> 00:02:31,040
that will be the equivalent of a bent

63
00:02:36,550 --> 00:02:33,680

pipe or real-time information

64
00:02:37,910 --> 00:02:36,560
obviously lifetime delays considered if

65
00:02:40,630 --> 00:02:37,920
we do not

66
00:02:42,470 --> 00:02:40,640
have odyssey in that configuration

67
00:02:45,190 --> 00:02:42,480
successfully rolled if it goes to safe

68
00:02:48,150 --> 00:02:45,200
mode or lockup doesn't occur whatever

69
00:02:51,110 --> 00:02:48,160
the next odyssey pass will be around two

70
00:02:53,110 --> 00:02:51,120
hours later about 12 30 a.m

71
00:02:54,390 --> 00:02:53,120
those are our two best opportunities to

72
00:02:56,070 --> 00:02:54,400
understand

73
00:02:57,270 --> 00:02:56,080
what the status of the rover is on the

74
00:02:59,270 --> 00:02:57,280
surface

75
00:03:01,110 --> 00:02:59,280
the other assets

76
00:03:02,229 --> 00:03:01,120
will be listening but we won't know from

77
00:03:04,229 --> 00:03:02,239
them for

78
00:03:06,550 --> 00:03:04,239
considerably a considerable number of

79
00:03:08,149 --> 00:03:06,560
hours later so that is the key is

80
00:03:10,390 --> 00:03:08,159
odyssey so i want to make sure everybody

81
00:03:12,470 --> 00:03:10,400
is clear on that might be monday morning

82
00:03:14,550 --> 00:03:12,480
before we uh understand it if odyssey

83
00:03:16,229 --> 00:03:14,560
isn't successful with that

84
00:03:18,149 --> 00:03:16,239
but if we are successful getting to the

85
00:03:20,550 --> 00:03:18,159
ground and we're successful with with

86
00:03:23,190 --> 00:03:20,560
odyssey information coming back

87
00:03:25,910 --> 00:03:23,200
we are going to have the opportunity for

88
00:03:27,750 --> 00:03:25,920

untold discoveries this location in gale

89
00:03:29,589 --> 00:03:27,760
crater is absolutely amazing a place we

90
00:03:31,750 --> 00:03:29,599
could never have thought of getting to

91
00:03:33,910 --> 00:03:31,760
just a few years ago

92
00:03:36,229 --> 00:03:33,920
it's a two-year mission not a 90-day

93
00:03:38,470 --> 00:03:36,239
mission so be patient we're going to be

94
00:03:40,630 --> 00:03:38,480
doing this thing sequentially

95
00:03:41,750 --> 00:03:40,640
intelligently smartly it's a complex

96
00:03:43,589 --> 00:03:41,760
system

97
00:03:46,949 --> 00:03:43,599
i hate to use the analogy again but i

98
00:03:48,390 --> 00:03:46,959
will it's a marathon not a sprint so we

99
00:03:49,589 --> 00:03:48,400
will keep people informed we'll keep

100
00:03:51,750 --> 00:03:49,599
moving forward and it's going to be

101
00:03:53,509 --> 00:03:51,760
exciting there's years of exploration

102
00:03:55,110 --> 00:03:53,519
coming

103
00:03:57,670 --> 00:03:55,120
the other thing that inquiring editors

104
00:03:58,789 --> 00:03:57,680
want to understand is imagery

105
00:04:01,429 --> 00:03:58,799
so i'm going to talk to you about

106
00:04:02,550 --> 00:04:01,439
briefly first images

107
00:04:04,710 --> 00:04:02,560
so

108
00:04:06,309 --> 00:04:04,720
if you'd bring the graphic up please

109
00:04:08,710 --> 00:04:06,319
little animation here

110
00:04:09,830 --> 00:04:08,720
on the front of the rover here down low

111
00:04:13,750 --> 00:04:09,840
on the deck

112
00:04:16,469 --> 00:04:15,509
what's important we'll spin around to

113
00:04:18,710 --> 00:04:16,479

the back

114
00:04:20,629 --> 00:04:18,720
the first pictures will be taken just

115
00:04:22,870 --> 00:04:20,639
shortly after touchdown

116
00:04:23,749 --> 00:04:22,880
by the rear hazard camera which you see

117
00:04:25,350 --> 00:04:23,759
here

118
00:04:26,710 --> 00:04:25,360
with covers on the covers are

119
00:04:28,390 --> 00:04:26,720
transparent

120
00:04:31,270 --> 00:04:28,400
the covers will come off but that first

121
00:04:33,510 --> 00:04:31,280
picture is taken with the covers on

122
00:04:34,790 --> 00:04:33,520
so we we don't know what we'll see

123
00:04:36,790 --> 00:04:34,800
through that we don't know how much dust

124
00:04:39,189 --> 00:04:36,800
will be on those covers but what's most

125
00:04:41,270 --> 00:04:39,199
important is we don't know if the timing

126
00:04:43,749 --> 00:04:41,280
of that picture being taken and and

127
00:04:47,030 --> 00:04:43,759
curiosity transmitting it will actually

128
00:04:48,950 --> 00:04:47,040
be well opportune i'm sorry while um

129
00:04:51,350 --> 00:04:48,960
odyssey is still in contact with it the

130
00:04:55,110 --> 00:04:51,360
timing is tight so we might not get that

131
00:04:56,870 --> 00:04:55,120
rear has cam image if we don't

132
00:05:00,070 --> 00:04:56,880
odyssey probably is already gone when

133
00:05:01,830 --> 00:05:00,080
the front has cam will open its cover

134
00:05:03,909 --> 00:05:01,840
and take an image but we won't get that

135
00:05:04,950 --> 00:05:03,919
image back the first chance of getting

136
00:05:08,469 --> 00:05:04,960
that back

137
00:05:10,469 --> 00:05:08,479
is that odyssey overflight at 12 30 a.m

138
00:05:12,150 --> 00:05:10,479

okay so the i'm not sure what the

139
00:05:13,670 --> 00:05:12,160
probability of success is on that rear

140
00:05:16,469 --> 00:05:13,680
has cam image but i'm not going to lay a

141
00:05:18,629 --> 00:05:16,479
whole lot on it so be patient 12 30 is a

142
00:05:20,310 --> 00:05:18,639
much better opportunity to to get that

143
00:05:24,629 --> 00:05:20,320
first image

144
00:05:27,189 --> 00:05:24,639
if we can bring that graphic up please

145
00:05:29,110 --> 00:05:27,199
the hazard cameras are designed for the

146
00:05:30,629 --> 00:05:29,120
nav team driving on the surface to be

147
00:05:32,230 --> 00:05:30,639
able to see where they're going and what

148
00:05:34,070 --> 00:05:32,240
the problems are

149
00:05:35,830 --> 00:05:34,080
these first ones are thumbnails i mean

150
00:05:37,590 --> 00:05:35,840
they're truly thumbnails

151
00:05:38,390 --> 00:05:37,600
and what you see on the bottom left is

152
00:05:41,110 --> 00:05:38,400
actually

153
00:05:42,870 --> 00:05:41,120
uh the the actual size of the image that

154
00:05:43,909 --> 00:05:42,880
we'll get back pretty small we've blown

155
00:05:46,150 --> 00:05:43,919
it up

156
00:05:47,909 --> 00:05:46,160
on the right so you see that it's even

157
00:05:50,230 --> 00:05:47,919
not a very high resolution because it's

158
00:05:52,550 --> 00:05:50,240
such a low-res picture it's going to be

159
00:05:54,070 --> 00:05:52,560
kind of fuzzy what it'll tell us is yep

160
00:05:55,990 --> 00:05:54,080
there's there's martian ground under so

161
00:05:57,749 --> 00:05:56,000
we are actually on the ground we got to

162
00:05:59,990 --> 00:05:57,759
the planet we wanted to get to

163
00:06:01,830 --> 00:06:00,000

and uh and it'll give us an idea what we

164
00:06:04,950 --> 00:06:01,840
have the front has cam and again it may

165
00:06:06,390 --> 00:06:04,960
be a dusty image uh if this is the rear

166
00:06:07,990 --> 00:06:06,400
one if it's the front one the covers

167
00:06:10,230 --> 00:06:08,000
will be off and it should be clearer

168
00:06:14,230 --> 00:06:10,240
it'll still be kind of pixelated

169
00:06:15,909 --> 00:06:14,240
higher resolution images will come later

170
00:06:18,390 --> 00:06:15,919
adam can probably give us more on on

171
00:06:19,990 --> 00:06:18,400
that i don't have the exact timeline

172
00:06:22,150 --> 00:06:20,000
but that hopefully helps a little bit on

173
00:06:23,830 --> 00:06:22,160
the communications process and what the

174
00:06:25,270 --> 00:06:23,840
first images in the first couple of

175
00:06:26,550 --> 00:06:25,280
hours on the surface are going to how

176
00:06:28,150 --> 00:06:26,560
that's going to work

177
00:06:29,590 --> 00:06:28,160
in the days years

178
00:06:30,870 --> 00:06:29,600
weeks to come there's going to be

179
00:06:33,110 --> 00:06:30,880
enormous

180
00:06:36,230 --> 00:06:33,120
number of images incredible images color

181
00:06:37,510 --> 00:06:36,240
images real color this time too so

182
00:06:39,990 --> 00:06:37,520
kind of like the human eye will see

183
00:06:41,430 --> 00:06:40,000
which will be really exciting

184
00:06:43,189 --> 00:06:41,440
and those will come and there'll be

185
00:06:45,590 --> 00:06:43,199
plenty of those

186
00:06:46,790 --> 00:06:45,600
so tonight's it super bowl of planetary

187
00:06:49,029 --> 00:06:46,800
exploration

188
00:06:51,670 --> 00:06:49,039

one yard line one play left that plays

189
00:06:54,309 --> 00:06:51,680
about 12 hours from now we score and win

190
00:06:56,309 --> 00:06:54,319
or we don't score and we don't win

191
00:06:58,629 --> 00:06:56,319
no matter what happens you know i just

192
00:06:59,990 --> 00:06:58,639
want the team to know i am really proud

193
00:07:01,589 --> 00:07:00,000
and i'm actually privileged to have

194
00:07:02,790 --> 00:07:01,599
worked with these guys and gals they're

195
00:07:04,070 --> 00:07:02,800
amazing

196
00:07:05,830 --> 00:07:04,080
we've done everything they've done

197
00:07:07,270 --> 00:07:05,840
everything humanly possible to make this

198
00:07:08,469 --> 00:07:07,280
happen

199
00:07:09,990 --> 00:07:08,479
if we don't do it and we're not

200
00:07:11,510 --> 00:07:10,000
successful

201
00:07:13,430 --> 00:07:11,520
we'll pick ourselves up we'll dust off

202
00:07:14,870 --> 00:07:13,440
we'll do it again the science is on the

203
00:07:16,390 --> 00:07:14,880
surface we need to keep going back and

204
00:07:18,150 --> 00:07:16,400
that's the plan but i think we're going

205
00:07:21,350 --> 00:07:18,160
to stick the landing

206
00:07:23,270 --> 00:07:21,360
brian over to you thanks doug

207
00:07:26,629 --> 00:07:23,280
so curiosity

208
00:07:28,830 --> 00:07:26,639
is has traveled over 566 million

209
00:07:31,270 --> 00:07:28,840
kilometers on its way to mars at this

210
00:07:33,430 --> 00:07:31,280
point and we only have a few kilometers

211
00:07:35,749 --> 00:07:33,440
to go to this evening

212
00:07:37,670 --> 00:07:35,759
the uh i'm i'm going to give everyone

213
00:07:39,589 --> 00:07:37,680

kind of an idea of

214
00:07:41,430 --> 00:07:39,599
the status of the spacecraft

215
00:07:43,029 --> 00:07:41,440
and what the flight team has been doing

216
00:07:44,629 --> 00:07:43,039
over the past 24 hours and and what

217
00:07:47,110 --> 00:07:44,639
we're going to be doing leading up to

218
00:07:49,029 --> 00:07:47,120
edl

219
00:07:51,430 --> 00:07:49,039
so the flight team right now is

220
00:07:53,029 --> 00:07:51,440
diligently monitoring the spacecraft and

221
00:07:55,589 --> 00:07:53,039
the ground systems and i'm pleased to

222
00:07:57,670 --> 00:07:55,599
say that the both systems remain very

223
00:08:00,550 --> 00:07:57,680
healthy

224
00:08:01,510 --> 00:08:00,560
spacecraft is in edl approach mode right

225
00:08:04,230 --> 00:08:01,520
now

226
00:08:06,469 --> 00:08:04,240
and it will transition to

227
00:08:10,309 --> 00:08:06,479
its next mode which is which we call edl

228
00:08:11,990 --> 00:08:10,319
main mode just just before uh entry

229
00:08:14,309 --> 00:08:12,000
the spacecraft is pointed in the right

230
00:08:15,909 --> 00:08:14,319
direction it's about a degree

231
00:08:19,029 --> 00:08:15,919
the the antenna is pointed about a

232
00:08:21,029 --> 00:08:19,039
degree off of earth and about 37 degrees

233
00:08:23,110 --> 00:08:21,039
away from the sun

234
00:08:25,670 --> 00:08:23,120
the solar rays are generating ample

235
00:08:27,830 --> 00:08:25,680
power and the battery state of charge is

236
00:08:30,869 --> 00:08:27,840
a hundred percent so we're ready to head

237
00:08:33,029 --> 00:08:30,879
in and get the rover going uh so we

238
00:08:35,029 --> 00:08:33,039

continue to have a strong communications

239
00:08:37,029 --> 00:08:35,039
link with the dsn

240
00:08:40,149 --> 00:08:37,039
in in cell phone speak where we have a

241
00:08:42,149 --> 00:08:40,159
full set of bars for four or five bars

242
00:08:44,470 --> 00:08:42,159
uh so that's been going well

243
00:08:46,070 --> 00:08:44,480
and uh we have a steady thermal and

244
00:08:47,190 --> 00:08:46,080
propulsion system

245
00:08:49,829 --> 00:08:47,200
at this time

246
00:08:51,269 --> 00:08:49,839
so over the past 24 hours uh

247
00:08:54,230 --> 00:08:51,279
we've been doing some work on the

248
00:08:56,070 --> 00:08:54,240
spacecraft just getting it ready for edl

249
00:08:57,990 --> 00:08:56,080
yesterday morning we decided to make a

250
00:09:00,070 --> 00:08:58,000
small adjustment

251
00:09:02,230 --> 00:09:00,080
to a parameter 3dl

252
00:09:04,070 --> 00:09:02,240
this will help improve the accuracy of

253
00:09:06,389 --> 00:09:04,080
the data that that's generated by

254
00:09:08,389 --> 00:09:06,399
inertial measurement unit

255
00:09:10,230 --> 00:09:08,399
during edl

256
00:09:12,790 --> 00:09:10,240
just after lunch

257
00:09:17,829 --> 00:09:15,590
went through an edl milestone so an

258
00:09:19,829 --> 00:09:17,839
autonomous action that is done by the

259
00:09:22,550 --> 00:09:19,839
spacecraft and that was called the mle

260
00:09:23,990 --> 00:09:22,560
anchor and at that anchor we basically

261
00:09:26,710 --> 00:09:24,000
turn on

262
00:09:29,269 --> 00:09:26,720
some heaters that will warm up the cat

263
00:09:31,430 --> 00:09:29,279

beds for the landing engines

264
00:09:33,430 --> 00:09:31,440
so that has those have been on uh since

265
00:09:35,670 --> 00:09:33,440
yesterday and they're nice and toasty

266
00:09:37,190 --> 00:09:35,680
and ready to go

267
00:09:39,350 --> 00:09:37,200
yesterday evening

268
00:09:42,070 --> 00:09:39,360
the flight team also

269
00:09:44,389 --> 00:09:42,080
configured the backup flight computer so

270
00:09:46,550 --> 00:09:44,399
the the remote compute element

271
00:09:48,470 --> 00:09:46,560
so that it's prepared for edl there was

272
00:09:50,150 --> 00:09:48,480
some software on there that we had to

273
00:09:53,030 --> 00:09:50,160
get configured and now that's ready to

274
00:09:54,949 --> 00:09:53,040
go just in case it's needed

275
00:09:57,030 --> 00:09:54,959
on this morning

276
00:09:59,030 --> 00:09:57,040
we determined that the final opportunity

277
00:10:01,990 --> 00:09:59,040
to adjust the flight path

278
00:10:04,150 --> 00:10:02,000
so what we call tcm-6

279
00:10:06,389 --> 00:10:04,160
is not needed so the flight path is

280
00:10:09,269 --> 00:10:06,399
looking good and we decide to wave off

281
00:10:11,190 --> 00:10:09,279
that opportunity we also decided uh to

282
00:10:13,670 --> 00:10:11,200
not use

283
00:10:15,750 --> 00:10:13,680
an opportunity to update the spacecraft

284
00:10:17,829 --> 00:10:15,760
knowledge of its flight path so not only

285
00:10:19,190 --> 00:10:17,839
do we have to get hit hit the right

286
00:10:21,430 --> 00:10:19,200
point at the at the top of the

287
00:10:23,910 --> 00:10:21,440
atmosphere but the spacecraft also has

288
00:10:24,949 --> 00:10:23,920

to know know where it's going

289
00:10:27,269 --> 00:10:24,959
and so we didn't have to take an

290
00:10:28,630 --> 00:10:27,279
opportunity to do that the the knowledge

291
00:10:30,630 --> 00:10:28,640
we have on board

292
00:10:32,949 --> 00:10:30,640
looks great

293
00:10:35,509 --> 00:10:32,959
okay so leading up to edl we have

294
00:10:37,829 --> 00:10:35,519
another one more opportunity uh if we

295
00:10:40,389 --> 00:10:37,839
choose to use it to update the knowledge

296
00:10:42,790 --> 00:10:40,399
of the flight path on the vehicle

297
00:10:44,790 --> 00:10:42,800
we expect that this will not be needed

298
00:10:46,949 --> 00:10:44,800
at this time however

299
00:10:51,190 --> 00:10:46,959
we're ready to use it

300
00:10:57,110 --> 00:10:53,990
we're going to continue and monitor

301
00:10:59,269 --> 00:10:57,120
the autonomous edl timeline actions so

302
00:11:02,069 --> 00:10:59,279
we have a number of them

303
00:11:03,509 --> 00:11:02,079
to go today leading up to edl and so the

304
00:11:06,310 --> 00:11:03,519
flight team are i'll make sure that

305
00:11:08,710 --> 00:11:06,320
those all get executed properly

306
00:11:10,790 --> 00:11:08,720
uh then then basically we're gonna be

307
00:11:13,990 --> 00:11:10,800
joining all of you and everyone across

308
00:11:17,190 --> 00:11:14,000
the globe glued to the edge of our seats

309
00:11:19,269 --> 00:11:17,200
just ready to experience the big event

310
00:11:21,590 --> 00:11:19,279
once we're on the surface the rover will

311
00:11:23,110 --> 00:11:21,600
transition the surface mode

312
00:11:25,750 --> 00:11:23,120
and it'll start to execute its first

313
00:11:28,230 --> 00:11:25,760

instructions on the rover

314
00:11:30,470 --> 00:11:28,240
and it'll prepare for the first odyssey

315
00:11:32,069 --> 00:11:30,480
communications pass that doug uh spoke

316
00:11:34,150 --> 00:11:32,079
to you about

317
00:11:35,750 --> 00:11:34,160
so the flight team is feeling really

318
00:11:37,430 --> 00:11:35,760
really good at the spacecraft about the

319
00:11:39,430 --> 00:11:37,440
spacecraft at this time they're very

320
00:11:40,470 --> 00:11:39,440
excited uh for the big event and they're

321
00:11:43,030 --> 00:11:40,480
ready

322
00:11:45,509 --> 00:11:43,040
for what's to come uh yesterday uh

323
00:11:46,870 --> 00:11:45,519
arthur amador uh the the other mission

324
00:11:48,949 --> 00:11:46,880
manager was up here talking to you and

325
00:11:50,710 --> 00:11:48,959
he got a question about uh team

326
00:11:51,750 --> 00:11:50,720
traditions that happened before big

327
00:11:53,350 --> 00:11:51,760
events

328
00:11:55,829 --> 00:11:53,360
and i think he talked to

329
00:11:57,829 --> 00:11:55,839
you all about peanuts and and how they

330
00:11:59,750 --> 00:11:57,839
give good luck before these kinds of

331
00:12:01,750 --> 00:11:59,760
things so i thought i'd bring up a

332
00:12:03,509 --> 00:12:01,760
couple of tradition more individual

333
00:12:04,629 --> 00:12:03,519
traditions that a couple of folks on the

334
00:12:06,629 --> 00:12:04,639
team have

335
00:12:09,829 --> 00:12:06,639
uh one of our engineers in the in the

336
00:12:11,750 --> 00:12:09,839
uplink area named matt linda he grew

337
00:12:13,350 --> 00:12:11,760
what is his version of what would be a

338
00:12:15,190 --> 00:12:13,360

playoff beard he kind of had these

339
00:12:18,389 --> 00:12:15,200
mutton chops

340
00:12:21,509 --> 00:12:18,399
that he was growing leading up to edl

341
00:12:23,030 --> 00:12:21,519
nagy cox who is also another uh uplink

342
00:12:25,110 --> 00:12:23,040
engineer she

343
00:12:27,829 --> 00:12:25,120
basically is going to be holding on to

344
00:12:30,870 --> 00:12:27,839
these two trinkets all day and their

345
00:12:32,949 --> 00:12:30,880
kind of relaxer

346
00:12:35,030 --> 00:12:32,959
and she's done this for other landing

347
00:12:35,829 --> 00:12:35,040
events like mer

348
00:12:37,030 --> 00:12:35,839
so

349
00:12:38,470 --> 00:12:37,040
if you see her around you'll probably

350
00:12:40,790 --> 00:12:38,480
see her holding the trinkets kind of

351
00:12:43,110 --> 00:12:40,800
keep her calm during the big event

352
00:12:44,710 --> 00:12:43,120
and we have another person named bobik

353
00:12:46,870 --> 00:12:44,720
ferdoci

354
00:12:49,110 --> 00:12:46,880
he's a flight director and system

355
00:12:50,790 --> 00:12:49,120
engineer uh for msl and he's been

356
00:12:53,350 --> 00:12:50,800
working throughout cruz

357
00:12:55,110 --> 00:12:53,360
and so his tradition and he's had this

358
00:12:57,030 --> 00:12:55,120
tradition through all of our system

359
00:12:59,430 --> 00:12:57,040
tests and launch and big events during

360
00:13:02,870 --> 00:12:59,440
cruise he basically comes up with a

361
00:13:03,590 --> 00:13:02,880
unique hairstyle every time

362
00:13:04,470 --> 00:13:03,600
and

363
00:13:06,949 --> 00:13:04,480

so

364
00:13:09,269 --> 00:13:06,959
he's very well known for this and before

365
00:13:10,870 --> 00:13:09,279
uh edl actually a few months ago we

366
00:13:13,110 --> 00:13:10,880
actually had a flight team vote about

367
00:13:14,949 --> 00:13:13,120
what his hairstyle should be

368
00:13:16,870 --> 00:13:14,959
and uh the flight team

369
00:13:19,430 --> 00:13:16,880
the majority ruled on the stars and

370
00:13:21,350 --> 00:13:19,440
stripes for him today and so if you see

371
00:13:23,110 --> 00:13:21,360
him walking around on the lab you'll see

372
00:13:24,550 --> 00:13:23,120
he's

373
00:13:26,710 --> 00:13:24,560
got what you would call

374
00:13:28,710 --> 00:13:26,720
more of a mohawk he's got some red and

375
00:13:31,030 --> 00:13:28,720
blue on the top and he's got some stars

376
00:13:33,670 --> 00:13:31,040
and stars on the side so

377
00:13:35,269 --> 00:13:33,680
that all those things are uh you know

378
00:13:37,910 --> 00:13:35,279
they work to keep people calm kind of

379
00:13:40,790 --> 00:13:37,920
keep the mood light and and also result

380
00:13:42,629 --> 00:13:40,800
in some good luck for curiosity

381
00:13:45,110 --> 00:13:42,639
so the spacecraft is also ready and

382
00:13:48,230 --> 00:13:45,120
continues uh it's very accurate flight

383
00:13:50,069 --> 00:13:48,240
path uh towards mars entry and the

384
00:13:52,230 --> 00:13:50,079
person responsible for that excellent

385
00:13:55,670 --> 00:13:52,240
navigation is here to my left and it's

386
00:13:59,910 --> 00:13:57,829
just to make clear i'm not the only

387
00:14:01,829 --> 00:13:59,920
responsible for this navigation is we

388
00:14:04,310 --> 00:14:01,839

have a whole navigation team and support

389
00:14:05,189 --> 00:14:04,320
teams like the propulsion team the acs

390
00:14:07,430 --> 00:14:05,199
team

391
00:14:10,790 --> 00:14:07,440
and the deeper space network that are

392
00:14:13,590 --> 00:14:10,800
helping us to do this good job

393
00:14:16,069 --> 00:14:13,600
curiosity is right now about 100 000

394
00:14:17,189 --> 00:14:16,079
miles from mars and is approaching mars

395
00:14:19,269 --> 00:14:17,199
setup

396
00:14:21,829 --> 00:14:19,279
at a speed of about

397
00:14:22,949 --> 00:14:21,839
8 000 miles per hour as you get closer

398
00:14:25,509 --> 00:14:22,959
to mars

399
00:14:27,269 --> 00:14:25,519
the gravitational pull of the planet

400
00:14:30,470 --> 00:14:27,279
is going to accelerate the spacecraft to

401
00:14:32,550 --> 00:14:30,480
a top speed of about 13 000 miles per

402
00:14:35,030 --> 00:14:32,560
hour then the ideal team will have to

403
00:14:36,629 --> 00:14:35,040
take care of

404
00:14:38,310 --> 00:14:36,639
the navigation team is continuing to

405
00:14:39,829 --> 00:14:38,320
receive tracking data

406
00:14:40,949 --> 00:14:39,839
from the antennas of the deep space

407
00:14:42,710 --> 00:14:40,959
network

408
00:14:44,870 --> 00:14:42,720
we will keep using this tracking data to

409
00:14:47,269 --> 00:14:44,880
monitor the trajectory of the spacecraft

410
00:14:48,710 --> 00:14:47,279
and so we can if necessary

411
00:14:50,949 --> 00:14:48,720
update entry state in the last

412
00:14:52,710 --> 00:14:50,959
opportunity

413
00:14:53,910 --> 00:14:52,720

just a reminder that the last time that

414
00:14:56,150 --> 00:14:53,920
we update the entry state of the

415
00:14:58,310 --> 00:14:56,160
spacecraft was on monday

416
00:15:00,710 --> 00:14:58,320
six days ago we have been able to

417
00:15:03,110 --> 00:15:00,720
predict the trajectory of the spacecraft

418
00:15:06,790 --> 00:15:03,120
over a distance of i think it's more

419
00:15:08,949 --> 00:15:06,800
than one million miles to an accuracy of

420
00:15:10,949 --> 00:15:08,959
something like 500 yards

421
00:15:14,069 --> 00:15:10,959
so that's pretty good

422
00:15:16,949 --> 00:15:14,079
over the last night we saw the effect

423
00:15:19,030 --> 00:15:16,959
of um getting closer to mars on our

424
00:15:20,150 --> 00:15:19,040
tracking data that's this one is more

425
00:15:22,949 --> 00:15:20,160
evident

426
00:15:25,350 --> 00:15:22,959
uh and it's in the last hours of

427
00:15:27,269 --> 00:15:25,360
the trajectory that the prediction

428
00:15:29,670 --> 00:15:27,279
errors either on the trajectory of the

429
00:15:31,990 --> 00:15:29,680
spacecraft or the planetary families of

430
00:15:33,509 --> 00:15:32,000
mars make themselves evident

431
00:15:34,949 --> 00:15:33,519
but the evidence this morning that we

432
00:15:37,749 --> 00:15:34,959
saw is that

433
00:15:40,230 --> 00:15:37,759
things are very well predicted another

434
00:15:42,150 --> 00:15:40,240
theme that we need to thank is the team

435
00:15:43,990 --> 00:15:42,160
that prepared the planetary families for

436
00:15:47,990 --> 00:15:44,000
us that tell us where mars is and they

437
00:15:51,670 --> 00:15:50,710
as brian mentioned the mission control

438
00:15:53,990 --> 00:15:51,680

team

439
00:15:56,550 --> 00:15:54,000
is not going to modify the trajectory of

440
00:15:58,310 --> 00:15:56,560
the spacecraft before entry anymore the

441
00:16:00,069 --> 00:15:58,320
last tcm opportunity tries to

442
00:16:01,350 --> 00:16:00,079
recorrection maneuver opportunity has

443
00:16:02,870 --> 00:16:01,360
been cancelled

444
00:16:05,350 --> 00:16:02,880
as a reminder too the last time that we

445
00:16:06,870 --> 00:16:05,360
modified the position was last saturday

446
00:16:11,110 --> 00:16:06,880
and we have canceled the last two

447
00:16:15,350 --> 00:16:12,550
the there is a

448
00:16:16,550 --> 00:16:15,360
small leftover delivery error but we are

449
00:16:18,949 --> 00:16:16,560
well within

450
00:16:21,110 --> 00:16:18,959
the the performance of the ideal system

451
00:16:26,629 --> 00:16:21,120
so edl should be able to take care of

452
00:16:31,110 --> 00:16:28,949
graphics please

453
00:16:33,430 --> 00:16:31,120
image

454
00:16:35,350 --> 00:16:33,440
so here you can see where we enter the

455
00:16:38,310 --> 00:16:35,360
atmosphere of mars

456
00:16:40,550 --> 00:16:38,320
where the guidance starts a few seconds

457
00:16:42,389 --> 00:16:40,560
later

458
00:16:44,949 --> 00:16:42,399
and where we have the shoot deploy and

459
00:16:47,350 --> 00:16:44,959
touchdown on the great crater the

460
00:16:50,790 --> 00:16:47,360
distance that we will go between entry

461
00:16:52,710 --> 00:16:50,800
and landing will be about 400 miles i

462
00:16:54,069 --> 00:16:52,720
believe

463
00:16:56,949 --> 00:16:54,079

and you can see there also the ground

464
00:17:00,550 --> 00:16:56,959
track of mro that will overfly curiosity

465
00:17:02,550 --> 00:17:00,560
as it descends into the calculator

466
00:17:04,630 --> 00:17:02,560
the estimate that we have right now of

467
00:17:05,590 --> 00:17:04,640
the entry point is that it's just

468
00:17:08,309 --> 00:17:05,600
about

469
00:17:09,750 --> 00:17:08,319
500 yards away from the entry point that

470
00:17:12,069 --> 00:17:09,760
is in the spacecraft

471
00:17:14,470 --> 00:17:12,079
so that's with well within the noise so

472
00:17:17,270 --> 00:17:14,480
that's why we decided not to update the

473
00:17:19,750 --> 00:17:17,280
entry state in the spacecraft

474
00:17:22,069 --> 00:17:19,760
um and it may be possible

475
00:17:25,029 --> 00:17:22,079
as brian mentioned that we will not need

476
00:17:27,270 --> 00:17:25,039
to update it anymore before we enter

477
00:17:29,430 --> 00:17:27,280
mars atmosphere

478
00:17:31,029 --> 00:17:29,440
uh so after processing we we have in

479
00:17:33,190 --> 00:17:31,039
derby determination team has been very

480
00:17:35,510 --> 00:17:33,200
busy the last months and the navigation

481
00:17:38,230 --> 00:17:35,520
team and especially the last

482
00:17:40,470 --> 00:17:38,240
96 hours we have processed millions of

483
00:17:42,150 --> 00:17:40,480
of the doppler data points

484
00:17:44,549 --> 00:17:42,160
hundreds of or tens of thousands of

485
00:17:46,549 --> 00:17:44,559
range measurements and also hundreds of

486
00:17:48,710 --> 00:17:46,559
interferometric measurements that the

487
00:17:50,150 --> 00:17:48,720
dsm the deep space network is doing

488
00:17:52,230 --> 00:17:50,160

using two antennas from different

489
00:17:53,750 --> 00:17:52,240
complexes that have has helped us also a

490
00:17:55,750 --> 00:17:53,760
lot

491
00:17:57,990 --> 00:17:55,760
and we are very confident that we will

492
00:17:59,510 --> 00:17:58,000
deliver curiosity to the right entry

493
00:18:02,310 --> 00:17:59,520
point in atmosphere of mars so you can

494
00:18:03,909 --> 00:18:02,320
safely land into the calculator

495
00:18:05,750 --> 00:18:03,919
so next

496
00:18:08,230 --> 00:18:05,760
adam is going to tell us about

497
00:18:12,150 --> 00:18:08,240
those last 400 miles

498
00:18:12,870 --> 00:18:12,160
into the crater thank you tomas

499
00:18:18,390 --> 00:18:12,880
as

500
00:18:20,789 --> 00:18:18,400
uh the spacecraft herself is going

501
00:18:22,710 --> 00:18:20,799
through her preparations

502
00:18:25,190 --> 00:18:22,720
getting herself ready

503
00:18:26,470 --> 00:18:25,200
for edl she's warming some uh some of

504
00:18:28,070 --> 00:18:26,480
the engines the rocket engines that

505
00:18:30,870 --> 00:18:28,080
we'll use during edl up so that they're

506
00:18:32,070 --> 00:18:30,880
ready poised to begin into descent

507
00:18:33,909 --> 00:18:32,080
landing

508
00:18:36,390 --> 00:18:33,919
as tomas mentioned

509
00:18:39,190 --> 00:18:36,400
the nav team has done an outstanding job

510
00:18:40,310 --> 00:18:39,200
of getting us right on target

511
00:18:41,669 --> 00:18:40,320
and so

512
00:18:44,710 --> 00:18:41,679
that leaves it

513
00:18:49,110 --> 00:18:46,950

this team

514
00:18:50,789 --> 00:18:49,120
i believe to be a tremendous team has

515
00:18:52,789 --> 00:18:50,799
worked really hard for the better part

516
00:18:53,510 --> 00:18:52,799
of a decade

517
00:18:55,510 --> 00:18:53,520
and

518
00:19:00,150 --> 00:18:55,520
the fruits of that labor

519
00:19:04,549 --> 00:19:02,390
it's a little anxiety provoking

520
00:19:05,590 --> 00:19:04,559
but i will say that i slept better last

521
00:19:09,510 --> 00:19:05,600
night

522
00:19:13,990 --> 00:19:09,520
than i have slept in a couple of years

523
00:19:17,190 --> 00:19:15,750
and when i look back at the hard work

524
00:19:19,669 --> 00:19:17,200
that we've done

525
00:19:21,590 --> 00:19:19,679
i believe that the team has done

526
00:19:24,789 --> 00:19:21,600
everything that we can to deserve

527
00:19:29,750 --> 00:19:24,799
success tonight although as we all know

528
00:19:33,669 --> 00:19:31,909
mars is cooperating

529
00:19:36,470 --> 00:19:33,679
the weather is pretty good

530
00:19:38,470 --> 00:19:36,480
if you could give me ashwin's slides

531
00:19:40,310 --> 00:19:38,480
our deputies project scientist ashwin

532
00:19:41,750 --> 00:19:40,320
vasavada

533
00:19:44,549 --> 00:19:41,760
is down for the count a little bit with

534
00:19:47,669 --> 00:19:44,559
a cold and i'm covering for him

535
00:19:49,510 --> 00:19:47,679
if you look um over australia

536
00:19:50,830 --> 00:19:49,520
uh you'll see a little circle there this

537
00:19:53,669 --> 00:19:50,840
is the map of

538
00:19:55,590 --> 00:19:53,679

earth think of it as a map of mars next

539
00:19:57,510 --> 00:19:55,600
slide

540
00:19:59,590 --> 00:19:57,520
and gale crater is a little bit above

541
00:20:03,270 --> 00:19:59,600
where australia would be on mars if

542
00:20:06,950 --> 00:20:05,190
looking at this map

543
00:20:09,750 --> 00:20:06,960
you'll see some

544
00:20:12,230 --> 00:20:09,760
yellow patches and some white cloudy

545
00:20:14,149 --> 00:20:12,240
patches we like the white cloudy patches

546
00:20:16,470 --> 00:20:14,159
those are ice clouds

547
00:20:18,070 --> 00:20:16,480
they mean the atmosphere is cold

548
00:20:20,230 --> 00:20:18,080
and clear

549
00:20:23,110 --> 00:20:20,240
high density that's what we like the

550
00:20:24,950 --> 00:20:23,120
dusty stuff the yellow

551
00:20:26,149 --> 00:20:24,960
warms the atmosphere makes a little less

552
00:20:29,110 --> 00:20:26,159
dense we

553
00:20:30,950 --> 00:20:29,120
don't prefer that actually curiosity's

554
00:20:32,230 --> 00:20:30,960
unusually adept at navigating the

555
00:20:33,750 --> 00:20:32,240
differences between those two and the

556
00:20:35,590 --> 00:20:33,760
uncertainties in them that's one of her

557
00:20:36,549 --> 00:20:35,600
special attributes

558
00:20:39,510 --> 00:20:36,559
but

559
00:20:40,789 --> 00:20:39,520
for tonight the atmosphere looks perfect

560
00:20:42,230 --> 00:20:40,799
although it may get a little dusty after

561
00:20:45,830 --> 00:20:42,240
we land

562
00:20:46,710 --> 00:20:45,840
we've got great weather for landing

563
00:20:48,630 --> 00:20:46,720

so

564
00:20:51,750 --> 00:20:48,640
the team is ready

565
00:20:52,870 --> 00:20:51,760
the spacecraft is ready

566
00:20:56,549 --> 00:20:52,880
and

567
00:21:01,110 --> 00:20:58,310
i would like to take a moment on behalf

568
00:21:04,710 --> 00:21:01,120
of my team to thank

569
00:21:05,909 --> 00:21:04,720
both the cruise team the nav team

570
00:21:07,350 --> 00:21:05,919
ipe

571
00:21:09,510 --> 00:21:07,360
acs

572
00:21:12,549 --> 00:21:09,520
rto dsn

573
00:21:13,990 --> 00:21:12,559
there's a whole bunch of acronyms

574
00:21:15,669 --> 00:21:14,000
which envelope

575
00:21:17,590 --> 00:21:15,679
tremendously talented folks who have

576
00:21:19,750 --> 00:21:17,600
worked diligently and very

577
00:21:21,029 --> 00:21:19,760
professionally under a lot of stress for

578
00:21:23,350 --> 00:21:21,039
the last months

579
00:21:25,669 --> 00:21:23,360
to deliver

580
00:21:27,190 --> 00:21:25,679
curiosity to where she is ready to do

581
00:21:30,470 --> 00:21:27,200
her job

582
00:21:35,430 --> 00:21:30,480
and on behalf of the edl team we're very

583
00:21:38,710 --> 00:21:36,789
and then finally

584
00:21:39,990 --> 00:21:38,720
just on a personal note some of the edl

585
00:21:42,070 --> 00:21:40,000
team members

586
00:21:43,750 --> 00:21:42,080
and myself we decided to sign up for

587
00:21:46,070 --> 00:21:43,760
some of the social media things that you

588
00:21:48,470 --> 00:21:46,080

can do twitter and facebook and so forth

589
00:21:50,950 --> 00:21:48,480
to allow us to make contact with uh

590
00:21:52,789 --> 00:21:50,960
with the general public and the outpour

591
00:21:55,029 --> 00:21:52,799
of support and encouragement we've

592
00:21:58,789 --> 00:21:55,039
received over the past week or so has

593
00:22:01,270 --> 00:21:58,799
been tremendous so we thank you out

594
00:22:03,270 --> 00:22:01,280
there for all the support and all the

595
00:22:05,909 --> 00:22:03,280
good wishes we need

596
00:22:08,549 --> 00:22:05,919
all of them we appreciate all of them

597
00:22:13,430 --> 00:22:11,029
rationally confident

598
00:22:15,190 --> 00:22:13,440
emotionally terrified

599
00:22:18,950 --> 00:22:15,200
and we're ready for edl

600
00:22:23,270 --> 00:22:20,630
okay with that we're going to start

601
00:22:25,270 --> 00:22:23,280
taking questions here in the room and

602
00:22:26,630 --> 00:22:25,280
let's see i'm going to

603
00:22:28,070 --> 00:22:26,640
start with news media first and then

604
00:22:29,510 --> 00:22:28,080
we're going to try to get some questions

605
00:22:30,630 --> 00:22:29,520
in from the participants of the nasa

606
00:22:32,230 --> 00:22:30,640
social i'm going to start at the back of

607
00:22:33,830 --> 00:22:32,240
the room and move up

608
00:22:35,669 --> 00:22:33,840
go ahead there and give us your name and

609
00:22:38,549 --> 00:22:35,679
your affiliation please

610
00:22:41,190 --> 00:22:38,559
leo enright with irish television and

611
00:22:44,310 --> 00:22:41,200
i'm curious what would happen if the

612
00:22:46,470 --> 00:22:44,320
ballast didn't uh deploy is is that a

613
00:22:48,789 --> 00:22:46,480

survivable scenario

614
00:22:49,750 --> 00:22:48,799
and also just uh fishing for a quote if

615
00:22:51,510 --> 00:22:49,760
i may

616
00:22:54,070 --> 00:22:51,520
um

617
00:22:56,710 --> 00:22:54,080
on a set on a separate matter

618
00:22:58,710 --> 00:22:56,720
what sort of what amount of control

619
00:23:00,870 --> 00:22:58,720
will you have during those seven minutes

620
00:23:03,830 --> 00:23:00,880
of terror as you sit in the control room

621
00:23:07,350 --> 00:23:03,840
compared to for example somebody sitting

622
00:23:09,990 --> 00:23:07,360
at home watching it on their television

623
00:23:13,590 --> 00:23:10,000
i'll take the first bit first

624
00:23:16,710 --> 00:23:13,600
um there are two pieces of tungsten uh

625
00:23:18,230 --> 00:23:16,720
adding up to about 145 kilograms in all

626
00:23:19,669 --> 00:23:18,240
total

627
00:23:21,430 --> 00:23:19,679
not shown here because this is the

628
00:23:23,590 --> 00:23:21,440
configuration of the spacecraft after

629
00:23:25,990 --> 00:23:23,600
she's removed them they're called the

630
00:23:28,149 --> 00:23:26,000
cruise ballast masses each of them are

631
00:23:29,750 --> 00:23:28,159
about the size of a laptop made out of

632
00:23:31,590 --> 00:23:29,760
tungsten which is a metal alloy that's

633
00:23:33,669 --> 00:23:31,600
very heavy and dense

634
00:23:35,510 --> 00:23:33,679
they sit right here sort of where my

635
00:23:38,470 --> 00:23:35,520
each of my fingernails would be

636
00:23:40,710 --> 00:23:38,480
and prior to entry we throw them away

637
00:23:43,269 --> 00:23:40,720
little springs and we toss them off

638
00:23:45,669 --> 00:23:43,279

and that creates the imbalance that we

639
00:23:47,350 --> 00:23:45,679
use to develop lift

640
00:23:49,110 --> 00:23:47,360
it's important that we get rid of those

641
00:23:50,789 --> 00:23:49,120
because without the lift we can't guide

642
00:23:53,110 --> 00:23:50,799
ourselves to the

643
00:23:55,190 --> 00:23:53,120
pinpoint target inside gale crater and

644
00:23:57,190 --> 00:23:55,200
we cannot attain the altitude

645
00:23:58,710 --> 00:23:57,200
performance that we would need

646
00:24:00,310 --> 00:23:58,720
we've done simulations where we only get

647
00:24:02,830 --> 00:24:00,320
one of them off

648
00:24:05,510 --> 00:24:02,840
we do remarkably well with

649
00:24:07,510 --> 00:24:05,520
those our odds are better than 50 50 if

650
00:24:09,110 --> 00:24:07,520
we get one of them off but they're still

651
00:24:11,110 --> 00:24:09,120
substantially less than what we think

652
00:24:13,590 --> 00:24:11,120
they are with both of them off so they

653
00:24:16,230 --> 00:24:13,600
both really need to get off and uh we're

654
00:24:18,549 --> 00:24:16,240
very confident they will

655
00:24:21,110 --> 00:24:18,559
as far as the amount of control

656
00:24:22,950 --> 00:24:21,120
that the team has during entry descent

657
00:24:23,830 --> 00:24:22,960
and landing

658
00:24:25,909 --> 00:24:23,840
it's

659
00:24:27,990 --> 00:24:25,919
identical to the control that anybody

660
00:24:33,269 --> 00:24:28,000
watching at home has

661
00:24:35,750 --> 00:24:34,549
okay the next question is here at the

662
00:24:37,669 --> 00:24:35,760
front of the room

663
00:24:40,630 --> 00:24:37,679

go ahead i'm frank mooring with aviation

664
00:24:43,029 --> 00:24:40,640
week for uh for brian for the second

665
00:24:43,830 --> 00:24:43,039
odyssey pass could you give us a rundown

666
00:24:46,230 --> 00:24:43,840
on

667
00:24:47,269 --> 00:24:46,240
what exactly the rover will be sending

668
00:24:48,710 --> 00:24:47,279
up

669
00:24:50,789 --> 00:24:48,720
and how it will

670
00:24:53,430 --> 00:24:50,799
how it will know that the

671
00:24:54,549 --> 00:24:53,440
orbiter is going overhead

672
00:24:58,070 --> 00:24:54,559
thank you

673
00:25:01,830 --> 00:24:59,350
so for the

674
00:25:03,669 --> 00:25:01,840
so the the odyssey pass that occurs at

675
00:25:06,870 --> 00:25:03,679
basically landing plus two hours which

676
00:25:08,549 --> 00:25:06,880
will be 12 30 am pdt

677
00:25:11,430 --> 00:25:08,559
um that's where

678
00:25:13,510 --> 00:25:11,440
uh i believe our best chance is to get

679
00:25:16,070 --> 00:25:13,520
the the first images

680
00:25:18,470 --> 00:25:16,080
right from the surface so

681
00:25:19,750 --> 00:25:18,480
doug talked to everybody about the rear

682
00:25:21,750 --> 00:25:19,760
haz cams

683
00:25:23,110 --> 00:25:21,760
would be taking an image and and went

684
00:25:25,510 --> 00:25:23,120
through that picture that that's

685
00:25:27,430 --> 00:25:25,520
actually what i think the

686
00:25:29,269 --> 00:25:27,440
the best information is that we're going

687
00:25:31,029 --> 00:25:29,279
to be getting at that time to say yes

688
00:25:31,909 --> 00:25:31,039

we're on the surface and yes you know

689
00:25:34,710 --> 00:25:31,919
things

690
00:25:37,110 --> 00:25:34,720
went uh as expected

691
00:25:39,190 --> 00:25:37,120
um so

692
00:25:41,029 --> 00:25:39,200
there's a couple things um

693
00:25:42,390 --> 00:25:41,039
with the audi with the odyssey pass

694
00:25:43,269 --> 00:25:42,400
after landing

695
00:25:45,750 --> 00:25:43,279
there's a

696
00:25:49,990 --> 00:25:47,590
we expect to get

697
00:25:52,230 --> 00:25:50,000
some spacecraft or rover health and

698
00:25:55,029 --> 00:25:52,240
safety telemetry

699
00:25:57,669 --> 00:25:55,039
through that pass so

700
00:26:00,070 --> 00:25:57,679
if if all is well then then we expect to

701
00:26:01,909 --> 00:26:00,080
get that telemetry and and if we do then

702
00:26:03,430 --> 00:26:01,919
we'll know some direct information about

703
00:26:05,029 --> 00:26:03,440
the rover health

704
00:26:06,630 --> 00:26:05,039
uh

705
00:26:08,950 --> 00:26:06,640
there are there are other scenarios

706
00:26:11,269 --> 00:26:08,960
where where maybe that telemetry doesn't

707
00:26:12,710 --> 00:26:11,279
come through but we see a signal

708
00:26:14,789 --> 00:26:12,720
the fact that the rover is sending a

709
00:26:16,230 --> 00:26:14,799
signal to odyssey that also tells us a

710
00:26:18,710 --> 00:26:16,240
tremendous amount of information that

711
00:26:20,710 --> 00:26:18,720
the spacecraft

712
00:26:22,149 --> 00:26:20,720
can communicate with odyssey and and

713
00:26:23,590 --> 00:26:22,159

we're getting data from and we know it's

714
00:26:25,510 --> 00:26:23,600
alive on the surface

715
00:26:29,110 --> 00:26:25,520
so i think those are really the key

716
00:26:32,909 --> 00:26:31,190
okay next question is in the front row

717
00:26:36,470 --> 00:26:32,919
i'm alan boyle with

718
00:26:38,230 --> 00:26:36,480
nbcnews.com and i wanted to just ask

719
00:26:39,830 --> 00:26:38,240
maybe brian if you could recap again it

720
00:26:42,149 --> 00:26:39,840
sounds as if there's no plan for a

721
00:26:44,149 --> 00:26:42,159
course correction and no no plan to

722
00:26:46,390 --> 00:26:44,159
update the uh

723
00:26:48,950 --> 00:26:46,400
navigation information

724
00:26:51,190 --> 00:26:48,960
yeah so so let me clarify a little bit

725
00:26:53,990 --> 00:26:51,200
you're correct on course corrections um

726
00:26:56,310 --> 00:26:54,000
we we decided this morning to not take

727
00:26:58,950 --> 00:26:56,320
advantage of our our last

728
00:27:00,870 --> 00:26:58,960
opportunity to do a course correction

729
00:27:03,269 --> 00:27:00,880
that course question

730
00:27:05,669 --> 00:27:03,279
was never really expected to be used but

731
00:27:07,990 --> 00:27:05,679
was planned at this time just in case it

732
00:27:09,350 --> 00:27:08,000
was needed as a contingency okay so

733
00:27:11,830 --> 00:27:09,360
things are going very well with the

734
00:27:13,430 --> 00:27:11,840
flight path as we discussed so

735
00:27:15,350 --> 00:27:13,440
we actually went more according to our

736
00:27:16,230 --> 00:27:15,360
plan and said yes we don't need to use

737
00:27:18,389 --> 00:27:16,240
that

738
00:27:21,110 --> 00:27:18,399

so things are going well as far as the

739
00:27:23,430 --> 00:27:21,120
actual flight path in the entry uh

740
00:27:24,549 --> 00:27:23,440
we we have one more opportunity to

741
00:27:26,070 --> 00:27:24,559
update

742
00:27:27,990 --> 00:27:26,080
the the

743
00:27:30,070 --> 00:27:28,000
parameters that tell the spacecraft

744
00:27:33,510 --> 00:27:30,080
where it is and where it is entering so

745
00:27:35,830 --> 00:27:33,520
we call it the onboard knowledge

746
00:27:36,710 --> 00:27:35,840
we still have that in front of us so

747
00:27:41,510 --> 00:27:36,720
we

748
00:27:43,190 --> 00:27:41,520
earlier this morning to decide whether

749
00:27:45,830 --> 00:27:43,200
to to use

750
00:27:48,310 --> 00:27:45,840
an earlier opportunity to update those

751
00:27:49,909 --> 00:27:48,320
that knowledge information we decided

752
00:27:52,070 --> 00:27:49,919
not to use that one because again the

753
00:27:54,389 --> 00:27:52,080
knowledge on board is very good

754
00:27:56,389 --> 00:27:54,399
as tomas mentioned so

755
00:27:58,870 --> 00:27:56,399
we have another opportunity in front of

756
00:27:59,990 --> 00:27:58,880
us to go through the decision process

757
00:28:01,990 --> 00:28:00,000
right now

758
00:28:04,870 --> 00:28:02,000
with the information that we know it's

759
00:28:06,549 --> 00:28:04,880
expected that we won't use that

760
00:28:08,950 --> 00:28:06,559
however it's put

761
00:28:12,070 --> 00:28:08,960
it's put close to edl for a reason and

762
00:28:14,389 --> 00:28:12,080
that's in in case it's needed so

763
00:28:15,750 --> 00:28:14,399

we still have more data to come

764
00:28:17,830 --> 00:28:15,760
so uh

765
00:28:19,269 --> 00:28:17,840
the way things look currently you don't

766
00:28:21,669 --> 00:28:19,279
expect that there will be any more

767
00:28:23,430 --> 00:28:21,679
uploading of information to the

768
00:28:25,430 --> 00:28:23,440
uh spacecraft

769
00:28:26,789 --> 00:28:25,440
um so i think our general expectation

770
00:28:29,510 --> 00:28:26,799
with the data we have now is that we

771
00:28:30,950 --> 00:28:29,520
won't need to do it however we still go

772
00:28:32,710 --> 00:28:30,960
through our regular processes and we

773
00:28:34,870 --> 00:28:32,720
collect the data so

774
00:28:36,549 --> 00:28:34,880
we we have a potential opportunity to do

775
00:28:39,029 --> 00:28:36,559
it if we need to so it could be totally

776
00:28:40,310 --> 00:28:39,039
watching from this point could be that's

777
00:28:44,870 --> 00:28:40,320
right

778
00:28:45,990 --> 00:28:44,880
second row again over here and then

779
00:28:48,310 --> 00:28:46,000
we're going to the other side of the

780
00:28:50,630 --> 00:28:48,320
room and i am keeping track of order of

781
00:28:52,950 --> 00:28:50,640
hands going up as best i can okay right

782
00:28:55,590 --> 00:28:52,960
it will go to you next okay okay thanks

783
00:28:56,389 --> 00:28:55,600
veronica um irene klotz with reuters the

784
00:29:00,070 --> 00:28:56,399
um

785
00:29:02,389 --> 00:29:00,080
is the picture uh with the rear has

786
00:29:05,029 --> 00:29:02,399
cameras the very first thing that

787
00:29:07,430 --> 00:29:05,039
msl is going to do once it's

788
00:29:10,230 --> 00:29:07,440

touching wheels down and could you go

789
00:29:13,029 --> 00:29:10,240
through a little bit about what the

790
00:29:14,549 --> 00:29:13,039
what curiosity is going to be doing

791
00:29:16,710 --> 00:29:14,559
whether or not

792
00:29:18,310 --> 00:29:16,720
there's any information from orbiting

793
00:29:19,750 --> 00:29:18,320
spacecraft

794
00:29:22,630 --> 00:29:19,760
coming back to earth or not so in other

795
00:29:23,909 --> 00:29:22,640
words what sort of its automated program

796
00:29:27,110 --> 00:29:23,919
um

797
00:29:29,909 --> 00:29:27,120
from touchdown until you guys want to be

798
00:29:31,350 --> 00:29:29,919
able to send some commands to it thanks

799
00:29:34,549 --> 00:29:31,360
sure um

800
00:29:38,549 --> 00:29:34,559
so what once uh the spacecraft touches

801
00:29:42,070 --> 00:29:38,559
down as i mentioned earlier

802
00:29:44,310 --> 00:29:42,080
and and the fly away is complete um

803
00:29:47,590 --> 00:29:44,320
the spacecraft goes through a mode

804
00:29:49,269 --> 00:29:47,600
transition so and and that's more of a

805
00:29:50,310 --> 00:29:49,279
flight software thing but

806
00:29:52,149 --> 00:29:50,320
the

807
00:29:53,430 --> 00:29:52,159
basically what it'll do is it'll say i

808
00:29:55,830 --> 00:29:53,440
know that i'm

809
00:29:58,070 --> 00:29:55,840
done with edl and i'm now going to go

810
00:30:00,630 --> 00:29:58,080
into a surface mode

811
00:30:02,950 --> 00:30:00,640
so it it goes through a transition it

812
00:30:04,549 --> 00:30:02,960
configures

813
00:30:05,990 --> 00:30:04,559

some of the communication systems and

814
00:30:06,950 --> 00:30:06,000
things like that

815
00:30:08,710 --> 00:30:06,960
and

816
00:30:11,510 --> 00:30:08,720
then

817
00:30:13,430 --> 00:30:11,520
we start to execute what is a called the

818
00:30:15,430 --> 00:30:13,440
soul zero sequence

819
00:30:17,830 --> 00:30:15,440
um i don't have all the details about

820
00:30:19,110 --> 00:30:17,840
what that sequence does uh right with me

821
00:30:21,750 --> 00:30:19,120
now but

822
00:30:23,510 --> 00:30:21,760
it's basically configuring itself

823
00:30:36,070 --> 00:30:23,520
to

824
00:30:40,870 --> 00:30:39,430
um do you know the time on that yes

825
00:30:42,549 --> 00:30:40,880
i'm going to repeat the question first

826
00:30:45,029 --> 00:30:42,559
because it wasn't on mike but how soon

827
00:30:47,590 --> 00:30:45,039
after landing is the first picture taken

828
00:30:50,310 --> 00:30:47,600
about within four minutes just a little

829
00:30:53,350 --> 00:30:50,320
under four minutes of touchdown

830
00:30:55,669 --> 00:30:53,360
those images are ready to go up

831
00:30:57,909 --> 00:30:55,679
and this is why doug mentioned there's a

832
00:31:00,710 --> 00:30:57,919
bit of a race condition as to when when

833
00:31:03,269 --> 00:31:00,720
the orbiters go out of link

834
00:31:05,509 --> 00:31:03,279
and whether those images images will get

835
00:31:07,509 --> 00:31:05,519
up before that happens

836
00:31:09,269 --> 00:31:07,519
okay go ahead good morning scott gold

837
00:31:11,110 --> 00:31:09,279
with the los angeles times can you

838
00:31:12,789 --> 00:31:11,120

provide a little bit more detail about

839
00:31:15,430 --> 00:31:12,799
your conversation over the course of

840
00:31:16,950 --> 00:31:15,440
today with odyssey in other words when

841
00:31:19,029 --> 00:31:16,960
will you reach out to odyssey and

842
00:31:21,110 --> 00:31:19,039
requested to start the role when will

843
00:31:23,509 --> 00:31:21,120
you start to get some good information

844
00:31:25,990 --> 00:31:23,519
that it is responding and talking back

845
00:31:28,789 --> 00:31:26,000
to you and when and over the course the

846
00:31:30,789 --> 00:31:28,799
day would you expect to know to some

847
00:31:33,669 --> 00:31:30,799
degree of certainty

848
00:31:34,950 --> 00:31:33,679
whether you'll have that 10 30 solid

849
00:31:36,870 --> 00:31:34,960
information or whether it will be a

850
00:31:38,630 --> 00:31:36,880
later pass before you start to get good

851
00:31:40,870 --> 00:31:38,640
information

852
00:31:43,990 --> 00:31:40,880
okay i'll take a crack at it brian fill

853
00:31:46,710 --> 00:31:44,000
in the gaps here so odyssey started its

854
00:31:49,029 --> 00:31:46,720
edl sequence already mro started it on

855
00:31:50,950 --> 00:31:49,039
friday so they are both

856
00:31:52,710 --> 00:31:50,960
not quite on autopilot but they're both

857
00:31:53,909 --> 00:31:52,720
moving forward with a planned sequence

858
00:31:56,549 --> 00:31:53,919
of events

859
00:31:58,789 --> 00:31:56,559
so uh the communications is

860
00:32:01,110 --> 00:31:58,799
odyssey is in communication with ground

861
00:32:03,509 --> 00:32:01,120
on a regular basis through the deep

862
00:32:06,070 --> 00:32:03,519
space network and so it's set to go so

863
00:32:08,870 --> 00:32:06,080

it that team will roll the spacecraft i

864
00:32:10,710 --> 00:32:08,880
don't know exactly how early uh but it's

865
00:32:12,630 --> 00:32:10,720
10 or 15 minutes i believe something to

866
00:32:15,430 --> 00:32:12,640
that effect prior to

867
00:32:17,269 --> 00:32:15,440
msl hitting the at top of the atmosphere

868
00:32:19,669 --> 00:32:17,279
that's really the key event as you

869
00:32:22,789 --> 00:32:19,679
recall we lost a reaction wheel

870
00:32:24,710 --> 00:32:22,799
on odyssey about five or six weeks ago

871
00:32:27,110 --> 00:32:24,720
so we're still learning about how this

872
00:32:29,269 --> 00:32:27,120
spacecraft operates on a different

873
00:32:31,269 --> 00:32:29,279
momentum configuration than it's had

874
00:32:32,470 --> 00:32:31,279
previously for its past 11 years of

875
00:32:34,070 --> 00:32:32,480
operation

876
00:32:36,389 --> 00:32:34,080
we think we have it nailed the team's

877
00:32:39,190 --> 00:32:36,399
done a great job figuring it out

878
00:32:41,190 --> 00:32:39,200
but there still is a bit of a risk

879
00:32:43,190 --> 00:32:41,200
in the process of rolling the spacecraft

880
00:32:45,190 --> 00:32:43,200
in this new configuration

881
00:32:46,710 --> 00:32:45,200
if we successfully roll it in its new

882
00:32:49,590 --> 00:32:46,720
config into that

883
00:32:51,669 --> 00:32:49,600
configuration where it's pointing at msl

884
00:32:53,830 --> 00:32:51,679
the reason it needs to do this

885
00:32:55,029 --> 00:32:53,840
a little side note is it's pretty low on

886
00:32:57,029 --> 00:32:55,039
the horizon

887
00:32:59,669 --> 00:32:57,039
okay so it's it's looking across the

888
00:33:01,430 --> 00:32:59,679

planet to some extent at msl whereas mro

889
00:33:03,909 --> 00:33:01,440
as you've seen in graphics yesterday and

890
00:33:05,430 --> 00:33:03,919
today goes right overhead

891
00:33:09,509 --> 00:33:05,440
odyssey's low on the horizon so it's got

892
00:33:13,350 --> 00:33:11,750
so if we successfully roll it i think

893
00:33:14,870 --> 00:33:13,360
we're good and we will start getting

894
00:33:17,990 --> 00:33:14,880
data back right away

895
00:33:20,870 --> 00:33:18,000
uh once it's there we're fine

896
00:33:22,710 --> 00:33:20,880
okay so if the the risk is that new

897
00:33:24,789 --> 00:33:22,720
momentum configuration creates an

898
00:33:26,470 --> 00:33:24,799
environment that the spacecraft can't

899
00:33:28,389 --> 00:33:26,480
control itself and it goes into safe

900
00:33:29,750 --> 00:33:28,399
mode then it'll be the next day probably

901
00:33:31,669 --> 00:33:29,760
you know anywhere from two to twelve

902
00:33:33,669 --> 00:33:31,679
hours before we get it back

903
00:33:36,389 --> 00:33:33,679
that's why there's some risk that we

904
00:33:38,310 --> 00:33:36,399
won't actually see touchdown itself

905
00:33:40,310 --> 00:33:38,320
odyssey is the only spacecraft that can

906
00:33:41,190 --> 00:33:40,320
actually see the touchdown event earth

907
00:33:43,029 --> 00:33:41,200
is set

908
00:33:43,909 --> 00:33:43,039
mro is recording

909
00:33:46,389 --> 00:33:43,919
mars

910
00:33:49,350 --> 00:33:46,399
express is recording and so it's the

911
00:33:50,950 --> 00:33:49,360
only real real-time asset that we have

912
00:33:52,950 --> 00:33:50,960
and so just one quick follow-up so you

913
00:33:55,269 --> 00:33:52,960

won't know whether the role has been uh

914
00:33:56,870 --> 00:33:55,279
completely successful really until 10 or

915
00:33:58,630 --> 00:33:56,880
15 minutes before the atmosphere so you

916
00:34:00,870 --> 00:33:58,640
will there's no you wouldn't know it say

917
00:34:02,950 --> 00:34:00,880
seven o'clock tonight okay we're not

918
00:34:04,389 --> 00:34:02,960
going to have 10 30 uh confirmation or

919
00:34:05,750 --> 00:34:04,399
we are you won't know that until it

920
00:34:07,669 --> 00:34:05,760
means until you do the role you don't

921
00:34:09,109 --> 00:34:07,679
know yeah you got to do it so it's all

922
00:34:10,550 --> 00:34:09,119
prepped it's been tested in the test

923
00:34:11,829 --> 00:34:10,560
beds over and over

924
00:34:13,349 --> 00:34:11,839
we think we understand how things are

925
00:34:14,389 --> 00:34:13,359
working right now all parameter files

926
00:34:15,510 --> 00:34:14,399
have been checked everything's been

927
00:34:17,349 --> 00:34:15,520
checked and run through the test bed

928
00:34:18,389 --> 00:34:17,359
multiple multiple times so we don't

929
00:34:20,550 --> 00:34:18,399
think there's a problem but we won't

930
00:34:22,069 --> 00:34:20,560
know it until we do it thank you and i

931
00:34:22,950 --> 00:34:22,079
can get you that exact time i don't know

932
00:34:25,109 --> 00:34:22,960
it off the top of my head but i think

933
00:34:26,470 --> 00:34:25,119
it's pretty short well across there yes

934
00:34:28,550 --> 00:34:26,480
it's that one first and then it'll move

935
00:34:29,829 --> 00:34:28,560
forward to you okay you can go ahead

936
00:34:32,069 --> 00:34:29,839
okay sure thank you

937
00:34:32,950 --> 00:34:32,079
uh olivier sangee and geospace.com in

938
00:34:34,550 --> 00:34:32,960

france

939
00:34:36,869 --> 00:34:34,560
as you know better than me there is a

940
00:34:39,430 --> 00:34:36,879
carl sagan memorial station mars so

941
00:34:42,069 --> 00:34:39,440
maybe it's a bit too early but have you

942
00:34:43,829 --> 00:34:42,079
already think about doing something like

943
00:34:45,829 --> 00:34:43,839
that even though there is not a fixed

944
00:34:47,990 --> 00:34:45,839
platform like spirit opportunity or mass

945
00:34:50,069 --> 00:34:48,000
pass finder do you have any names idea

946
00:34:54,790 --> 00:34:50,079
or is it really too

947
00:34:57,990 --> 00:34:56,869
no i'm sorry yeah i was writing

948
00:35:00,470 --> 00:34:58,000
something down i'm sorry could you

949
00:35:03,990 --> 00:35:00,480
repeat that unless you got it my mistake

950
00:35:06,710 --> 00:35:05,349
within the team and i think within the

951
00:35:08,470 --> 00:35:06,720
program people have started to think

952
00:35:11,270 --> 00:35:08,480
about what we what we might do with

953
00:35:16,630 --> 00:35:11,280
where we land but no uh decision that

954
00:35:16,640 --> 00:35:21,430
right now it's informal

955
00:35:24,310 --> 00:35:22,870
thanks very much ivan semenek from

956
00:35:26,630 --> 00:35:24,320
nature i actually have a question for

957
00:35:27,990 --> 00:35:26,640
adam uh it's about the dust i just would

958
00:35:29,829 --> 00:35:28,000
like a little bit more information about

959
00:35:30,870 --> 00:35:29,839
that the way you described it it sounded

960
00:35:33,109 --> 00:35:30,880
as though

961
00:35:35,430 --> 00:35:33,119
the air over the uh the landing site

962
00:35:37,109 --> 00:35:35,440
will get a bit dustier after the landing

963
00:35:39,910 --> 00:35:37,119

is that because there's a weather

964
00:35:42,150 --> 00:35:39,920
pattern approaching and or how and what

965
00:35:44,069 --> 00:35:42,160
what how do we know that so we're

966
00:35:46,710 --> 00:35:44,079
landing right now in a transitional

967
00:35:47,990 --> 00:35:46,720
season i'll play ashwin vasavada for a

968
00:35:49,750 --> 00:35:48,000
moment here

969
00:35:52,069 --> 00:35:49,760
in a transitional season between the

970
00:35:54,310 --> 00:35:52,079
cold and clear season on mars and the

971
00:35:56,710 --> 00:35:54,320
warm and dusty season on mars

972
00:35:59,990 --> 00:35:56,720
and during that transition period you

973
00:36:02,150 --> 00:36:00,000
get a lot of storms that occur on the

974
00:36:04,230 --> 00:36:02,160
pole at the cap edge they're called cap

975
00:36:05,109 --> 00:36:04,240
edge storms

976
00:36:07,750 --> 00:36:05,119
they

977
00:36:09,990 --> 00:36:07,760
occur at the transition between the co2

978
00:36:11,589 --> 00:36:10,000
frost region and the non-frosty region

979
00:36:12,550 --> 00:36:11,599
and that albedo difference generates a

980
00:36:14,390 --> 00:36:12,560
lot of

981
00:36:15,750 --> 00:36:14,400
vorticity and storm

982
00:36:17,510 --> 00:36:15,760
generation

983
00:36:20,390 --> 00:36:17,520
we've been seeing that happening small

984
00:36:21,430 --> 00:36:20,400
cap edge dust storms taking place and

985
00:36:24,870 --> 00:36:21,440
actually

986
00:36:26,790 --> 00:36:24,880
in today's data there is a decent sized

987
00:36:29,990 --> 00:36:26,800
again still local

988
00:36:31,589 --> 00:36:30,000

cap edge dust storm just uh east in the

989
00:36:33,910 --> 00:36:31,599
helles basin

990
00:36:35,990 --> 00:36:33,920
and that storm

991
00:36:38,390 --> 00:36:36,000
will lift some dust that may

992
00:36:41,109 --> 00:36:38,400
def may become diffuse and may be drawn

993
00:36:42,390 --> 00:36:41,119
over the landing site but the speeds at

994
00:36:43,349 --> 00:36:42,400
which the dust could make it to the

995
00:36:45,510 --> 00:36:43,359
landing site we'll take it to the

996
00:36:47,109 --> 00:36:45,520
landing site later and it's very likely

997
00:36:49,349 --> 00:36:47,119
that it will dissipate and we would be

998
00:36:51,990 --> 00:36:49,359
unnoticeable at the landing site but we

999
00:36:54,069 --> 00:36:52,000
have been monitoring on a daily basis

1000
00:36:56,150 --> 00:36:54,079
for a couple weeks now the weather and

1001
00:36:58,230 --> 00:36:56,160
tracking things just like this storm and

1002
00:36:59,589 --> 00:36:58,240
if the storm had happened three days ago

1003
00:37:00,870 --> 00:36:59,599
we might be sweating a little bit

1004
00:37:02,390 --> 00:37:00,880
because

1005
00:37:04,950 --> 00:37:02,400
we might be worried that it might have

1006
00:37:06,550 --> 00:37:04,960
come on uh up to gail and then we we may

1007
00:37:07,589 --> 00:37:06,560
have chosen to model atmosphere

1008
00:37:09,349 --> 00:37:07,599
differently

1009
00:37:11,589 --> 00:37:09,359
and and

1010
00:37:12,710 --> 00:37:11,599
so what's the impact on the spacecraft

1011
00:37:15,109 --> 00:37:12,720
if the atmosphere were a little bit

1012
00:37:15,910 --> 00:37:15,119
warmer because once she's on the surface

1013
00:37:17,030 --> 00:37:15,920

there's

1014
00:37:19,109 --> 00:37:17,040
actually

1015
00:37:20,470 --> 00:37:19,119
even with an edl there's not really much

1016
00:37:22,069 --> 00:37:20,480
impact

1017
00:37:24,390 --> 00:37:22,079
maybe some of her margins would have

1018
00:37:26,550 --> 00:37:24,400
been reduced uh during entry descent and

1019
00:37:29,030 --> 00:37:26,560
landing uh specifically the guided entry

1020
00:37:31,349 --> 00:37:29,040
portion uh she might have had to use

1021
00:37:32,630 --> 00:37:31,359
some of the control authority that she

1022
00:37:34,710 --> 00:37:32,640
could have

1023
00:37:36,230 --> 00:37:34,720
if if tomas hadn't put us right down the

1024
00:37:37,589 --> 00:37:36,240
pipe

1025
00:37:39,030 --> 00:37:37,599
we may have needed some of the

1026
00:37:40,230 --> 00:37:39,040
atmospheric

1027
00:37:42,790 --> 00:37:40,240
the control authority we would have used

1028
00:37:44,950 --> 00:37:42,800
for atmospheric variation to handle

1029
00:37:46,230 --> 00:37:44,960
a delivery error the delivery errors

1030
00:37:48,150 --> 00:37:46,240
aren't there and the atmosphere is right

1031
00:37:50,470 --> 00:37:48,160
down the middle so she's in fine shape

1032
00:37:52,550 --> 00:37:50,480
once she's on the surface dust doesn't

1033
00:37:54,870 --> 00:37:52,560
really matter to her okay

1034
00:37:56,470 --> 00:37:54,880
okay we're going a few rows back there

1035
00:37:58,470 --> 00:37:56,480
thank you

1036
00:37:59,910 --> 00:37:58,480
thanks hi it's bill harwood cbs news uh

1037
00:38:02,069 --> 00:37:59,920
one quick one for brian and one for doug

1038
00:38:04,310 --> 00:38:02,079

for brian pictures aside assuming we

1039
00:38:06,230 --> 00:38:04,320
don't get a picture on that first pass

1040
00:38:07,910 --> 00:38:06,240
what is the actual data you see that

1041
00:38:09,750 --> 00:38:07,920
that shows weight on wheels i mean what

1042
00:38:11,349 --> 00:38:09,760
is it that you would see on a screen in

1043
00:38:12,790 --> 00:38:11,359
the control room that says this thing's

1044
00:38:14,150 --> 00:38:12,800
on the surface

1045
00:38:16,390 --> 00:38:14,160
all right follow actually i don't know

1046
00:38:19,430 --> 00:38:16,400
adam you want to talk about the edel.com

1047
00:38:22,230 --> 00:38:19,440
uh well to um

1048
00:38:23,670 --> 00:38:22,240
we are taking data um

1049
00:38:25,990 --> 00:38:23,680
to confirm that we've touched down

1050
00:38:28,390 --> 00:38:26,000
safely and we have uh

1051
00:38:30,790 --> 00:38:28,400
three different signals that we use for

1052
00:38:32,069 --> 00:38:30,800
for uh to confirm touchdown and we need

1053
00:38:33,750 --> 00:38:32,079
all three of those things to look right

1054
00:38:36,069 --> 00:38:33,760
before we say go

1055
00:38:37,910 --> 00:38:36,079
um one of those is a a message from the

1056
00:38:39,589 --> 00:38:37,920
spacecraft that says i touch down and

1057
00:38:40,630 --> 00:38:39,599
this is the velocity i speed i touch

1058
00:38:43,430 --> 00:38:40,640
down at

1059
00:38:45,910 --> 00:38:43,440
and where i think i am

1060
00:38:48,390 --> 00:38:45,920
the other is a uh

1061
00:38:49,670 --> 00:38:48,400
this the rover has an inertial

1062
00:38:52,470 --> 00:38:49,680
measurement unit

1063
00:38:54,230 --> 00:38:52,480

uh a gyro and an accelerometer set

1064
00:38:56,470 --> 00:38:54,240
and we look at that stream to say that

1065
00:38:59,910 --> 00:38:56,480
the rover's not moving at all

1066
00:39:02,069 --> 00:38:59,920
so it's that that signal says i'm i'm i

1067
00:39:03,510 --> 00:39:02,079
think i'm on the ground and i'm not

1068
00:39:06,710 --> 00:39:03,520
moving

1069
00:39:07,750 --> 00:39:06,720
and then the third is we wait a a as a a

1070
00:39:09,750 --> 00:39:07,760
safe

1071
00:39:12,870 --> 00:39:09,760
period of time and confirm we're getting

1072
00:39:14,310 --> 00:39:12,880
continuous uhf transmission

1073
00:39:15,829 --> 00:39:14,320
and frankly that's there to make sure

1074
00:39:18,230 --> 00:39:15,839
that the descent stage hasn't fallen

1075
00:39:20,630 --> 00:39:18,240
back down on top of the rover

1076
00:39:23,589 --> 00:39:20,640
and when all three of those signals are

1077
00:39:25,750 --> 00:39:23,599
are positive we declare touchdown

1078
00:39:27,829 --> 00:39:25,760
confirmation and then that's to the best

1079
00:39:30,069 --> 00:39:27,839
of our knowledge all that we could see

1080
00:39:31,829 --> 00:39:30,079
means that that spacecraft curiosity is

1081
00:39:34,390 --> 00:39:31,839
sitting on the surface

1082
00:39:36,470 --> 00:39:34,400
thanks and a quick one uh for doug you

1083
00:39:37,829 --> 00:39:36,480
mentioned our editors and what folks

1084
00:39:39,670 --> 00:39:37,839
want to know during landing and you've

1085
00:39:40,950 --> 00:39:39,680
also mentioned you know that like any

1086
00:39:42,790 --> 00:39:40,960
good manager would that you don't know

1087
00:39:45,430 --> 00:39:42,800
that this is going to succeed or not

1088
00:39:47,750 --> 00:39:45,440

what are the stakes for this mission

1089
00:39:49,430 --> 00:39:47,760
success versus failure in the context of

1090
00:39:51,190 --> 00:39:49,440
the budget pressure nasa is under in the

1091
00:39:53,270 --> 00:39:51,200
planetary program and everything else i

1092
00:39:55,030 --> 00:39:53,280
mean i had one guy tell me oh if this

1093
00:39:57,510 --> 00:39:55,040
thing fails this is this is just this

1094
00:39:58,550 --> 00:39:57,520
huge disaster for mars and we lose the

1095
00:40:00,710 --> 00:39:58,560
decade

1096
00:40:02,630 --> 00:40:00,720
and obviously if it succeeds it's it's

1097
00:40:04,710 --> 00:40:02,640
the greatest mission that you guys will

1098
00:40:06,630 --> 00:40:04,720
have ever attempted how do you view

1099
00:40:08,069 --> 00:40:06,640
those two things in the context of

1100
00:40:10,630 --> 00:40:08,079
what's going on right now with nasa

1101
00:40:12,550 --> 00:40:10,640
thanks

1102
00:40:14,630 --> 00:40:12,560
well i think if we succeed it will be

1103
00:40:17,190 --> 00:40:14,640
one of the greatest feats in uh in

1104
00:40:19,510 --> 00:40:17,200
planetary exploration ever

1105
00:40:20,390 --> 00:40:19,520
not to mention just this decade i think

1106
00:40:24,870 --> 00:40:20,400
it

1107
00:40:26,390 --> 00:40:24,880
states has had in the exploration of

1108
00:40:28,390 --> 00:40:26,400
mars and our success rate has been

1109
00:40:30,550 --> 00:40:28,400
pretty darn good recently knock on wood

1110
00:40:31,829 --> 00:40:30,560
obviously

1111
00:40:33,910 --> 00:40:31,839
if it fails i think we need to

1112
00:40:36,470 --> 00:40:33,920
understand how it failed

1113
00:40:38,230 --> 00:40:36,480

but i think that these things are really

1114
00:40:40,069 --> 00:40:38,240
hard to do which is why we keep talking

1115
00:40:41,510 --> 00:40:40,079
about it

1116
00:40:43,430 --> 00:40:41,520
does it mean the end of the program no

1117
00:40:46,069 --> 00:40:43,440
it means that we've had a setback it

1118
00:40:48,390 --> 00:40:46,079
means we will step back a notch we will

1119
00:40:49,750 --> 00:40:48,400
learn what happened we will already have

1120
00:40:52,550 --> 00:40:49,760
some data that we've learned whether

1121
00:40:54,870 --> 00:40:52,560
it's the radiation data we've received

1122
00:40:55,750 --> 00:40:54,880
for the last eight months of cruise

1123
00:40:57,589 --> 00:40:55,760
or

1124
00:40:59,750 --> 00:40:57,599
just the fact that we understand how to

1125
00:41:00,950 --> 00:40:59,760
build a system now that can do guided

1126
00:41:02,710 --> 00:41:00,960
entry and get us into smaller and

1127
00:41:03,510 --> 00:41:02,720
smaller landing areas

1128
00:41:04,950 --> 00:41:03,520
so

1129
00:41:06,470 --> 00:41:04,960
we've learned a lot from this mission we

1130
00:41:08,390 --> 00:41:06,480
will learn from the failure we'll figure

1131
00:41:09,990 --> 00:41:08,400
out what the problem was and we'll go

1132
00:41:12,230 --> 00:41:10,000
back and we'll do it again

1133
00:41:13,990 --> 00:41:12,240
so a failure is a setback it's not a

1134
00:41:15,510 --> 00:41:14,000
disaster

1135
00:41:19,589 --> 00:41:15,520
and we can learn from it and we'll move

1136
00:41:22,309 --> 00:41:21,190
okay we're going to move a few rows

1137
00:41:24,230 --> 00:41:22,319
forward

1138
00:41:26,390 --> 00:41:24,240

there you go

1139
00:41:28,230 --> 00:41:26,400
henry bortman astrobiology magazine i'm

1140
00:41:30,230 --> 00:41:28,240
still slightly confused about what

1141
00:41:31,270 --> 00:41:30,240
messages come when sorry i know you

1142
00:41:32,950 --> 00:41:31,280
tried

1143
00:41:35,589 --> 00:41:32,960
um

1144
00:41:37,109 --> 00:41:35,599
this velocity and position message short

1145
00:41:39,750 --> 00:41:37,119
message that was referred to yesterday

1146
00:41:44,390 --> 00:41:39,760
as a beep that's relayed by odyssey or

1147
00:41:48,550 --> 00:41:46,230
i'm not sure what was referred to as a

1148
00:41:51,109 --> 00:41:48,560
beep yesterday so i don't know

1149
00:41:54,550 --> 00:41:51,119
totally how to cover that there's upon

1150
00:41:57,109 --> 00:41:54,560
touchdown through odyssey

1151
00:42:00,150 --> 00:41:57,119
there is a uhf

1152
00:42:02,390 --> 00:42:00,160
data message from the rover that says i

1153
00:42:03,829 --> 00:42:02,400
i think i landed at this speed at this

1154
00:42:05,430 --> 00:42:03,839
location

1155
00:42:08,790 --> 00:42:05,440
and that goes through odyssey

1156
00:42:13,109 --> 00:42:11,270
okay up here in the very front

1157
00:42:14,390 --> 00:42:13,119
there we go

1158
00:42:15,750 --> 00:42:14,400
thank you i just want to come back to

1159
00:42:17,510 --> 00:42:15,760
the

1160
00:42:19,190 --> 00:42:17,520
question of of

1161
00:42:20,390 --> 00:42:19,200
how soon you may know whether you're

1162
00:42:22,470 --> 00:42:20,400
going to know

1163
00:42:25,030 --> 00:42:22,480

that you're going to that

1164
00:42:27,750 --> 00:42:25,040
that the thing is gone is on the ground

1165
00:42:28,829 --> 00:42:27,760
in real time so

1166
00:42:30,390 --> 00:42:28,839
you say that

1167
00:42:33,109 --> 00:42:30,400
odyssey you're going to have to roll

1168
00:42:34,150 --> 00:42:33,119
this thing about 10 to 15 minutes before

1169
00:42:36,950 --> 00:42:34,160
msl

1170
00:42:38,950 --> 00:42:36,960
entry time so that's like shortly after

1171
00:42:40,150 --> 00:42:38,960
10 o'clock i guess something you know

1172
00:42:41,670 --> 00:42:40,160
somewhere around there yeah i'm going to

1173
00:42:43,270 --> 00:42:41,680
get the exact time

1174
00:42:45,829 --> 00:42:43,280
and then

1175
00:42:47,349 --> 00:42:45,839
you'll know you know like right away

1176
00:42:48,630 --> 00:42:47,359
pretty much when that roll was supposed

1177
00:42:49,670 --> 00:42:48,640
to occur whether it occurred correctly

1178
00:42:50,950 --> 00:42:49,680
whether you've got the configuration

1179
00:42:52,550 --> 00:42:50,960
you're looking for

1180
00:42:54,230 --> 00:42:52,560
they'll be in contact with it when we do

1181
00:42:56,390 --> 00:42:54,240
the roll so we can infer from that that

1182
00:42:58,790 --> 00:42:56,400
within i don't know like 15-20 minutes

1183
00:43:00,069 --> 00:42:58,800
of the scheduled landing time

1184
00:43:00,950 --> 00:43:00,079
you'll know whether you should be

1185
00:43:02,390 --> 00:43:00,960
getting

1186
00:43:04,309 --> 00:43:02,400
the uhf

1187
00:43:05,829 --> 00:43:04,319
signal back through odyssey that would

1188
00:43:07,430 --> 00:43:05,839

be able to confirm that the thing is

1189
00:43:09,750 --> 00:43:07,440
landed safely

1190
00:43:11,829 --> 00:43:09,760
right so odyssey will receive

1191
00:43:14,630 --> 00:43:11,839
will communicate with msl through its

1192
00:43:16,870 --> 00:43:14,640
descent profile so it will be in contact

1193
00:43:18,390 --> 00:43:16,880
and that's how we will

1194
00:43:20,470 --> 00:43:18,400
understand what's happening through the

1195
00:43:22,150 --> 00:43:20,480
sequence with great detail as opposed to

1196
00:43:24,790 --> 00:43:22,160
just tones

1197
00:43:27,030 --> 00:43:24,800
that we that was discussed yesterday

1198
00:43:29,349 --> 00:43:27,040
and so it will see it all the way to

1199
00:43:30,870 --> 00:43:29,359
touchdown unlike the other assets it

1200
00:43:33,109 --> 00:43:30,880
will see it all the way to touchdown and

1201
00:43:35,270 --> 00:43:33,119
it will transmit that data back to us

1202
00:43:37,270 --> 00:43:35,280
in real time as it sees it now that's

1203
00:43:38,470 --> 00:43:37,280
ignoring the light delay of course

1204
00:43:41,190 --> 00:43:38,480
right but you'll know if it's not

1205
00:43:43,109 --> 00:43:41,200
available for before edl is complete oh

1206
00:43:45,349 --> 00:43:43,119
yeah we'll we'll know right away if the

1207
00:43:46,790 --> 00:43:45,359
if that role is not successful and it

1208
00:43:50,470 --> 00:43:46,800
goes to safe mode we'll know it right

1209
00:43:52,230 --> 00:43:50,480
when it happens yeah okay thanks yeah

1210
00:43:55,510 --> 00:43:52,240
next question is further back

1211
00:44:00,870 --> 00:43:57,829
uh todd halverson of florida today in

1212
00:44:04,230 --> 00:44:00,880
usa today for uh doug

1213
00:44:07,750 --> 00:44:04,240

in the event of a really really bad day

1214
00:44:09,990 --> 00:44:07,760
there will probably be questions almost

1215
00:44:11,910 --> 00:44:10,000
immediately about the fate of the rtg on

1216
00:44:15,109 --> 00:44:11,920
board and i'm wondering if you could

1217
00:44:15,990 --> 00:44:15,119
cover the credible scenarios for the

1218
00:44:20,309 --> 00:44:16,000
fate

1219
00:44:21,750 --> 00:44:20,319
of the rtg in a crash landing and the

1220
00:44:25,349 --> 00:44:21,760
fate of the

1221
00:44:28,150 --> 00:44:25,359
p238 fuel on board thanks

1222
00:44:31,430 --> 00:44:28,160
sure todd um

1223
00:44:33,030 --> 00:44:31,440
the rtg was designed to withstand

1224
00:44:35,270 --> 00:44:33,040
launch failure

1225
00:44:37,829 --> 00:44:35,280
in many different explosive environments

1226
00:44:39,030 --> 00:44:37,839
and considering the energetics involved

1227
00:44:42,309 --> 00:44:39,040
in launch

1228
00:44:44,550 --> 00:44:42,319
and the altitudes that can be involved

1229
00:44:47,190 --> 00:44:44,560
if we crash it on the surface of mars

1230
00:44:49,030 --> 00:44:47,200
it's a much less severe environment than

1231
00:44:49,040 --> 00:44:52,390
the failure
the plutonium is in what's called clads