1
00:00:10,230 --> 00:00:07,990
good morning and welcome to nasa's jet

2
00:00:12,390 --> 00:00:10,240
propulsion laboratory today is l minus

3
00:00:14,150 --> 00:00:12,400
one that's landing day minus one and it

4
00:00:15,829 --> 00:00:14,160
the everyone is getting more and more

5
00:00:18,070 --> 00:00:15,839
excited as we get closer to the landing

6
00:00:21,510 --> 00:00:18,080
of the mars curiosity rover

7
00:00:23,189 --> 00:00:21,520
tomorrow at 10 31 pm pacific time i'm

8
00:00:24,630 --> 00:00:23,199
going to introduce our panel from the

9
00:00:26,470 --> 00:00:24,640
mission team they're going to explain a

10
00:00:28,390 --> 00:00:26,480
little bit more about what to expect

11
00:00:31,269 --> 00:00:28,400
tomorrow night and

12
00:00:33,510 --> 00:00:31,279
we'll start with uh doug mcquistion he's

13
00:00:40,150 --> 00:00:33,520

from nasa headquarters and he is the

14
00:00:44,950 --> 00:00:42,389
arthur amador from the jet propulsion

15
00:00:50,150 --> 00:00:44,960
laboratory he is the mission manager for

16
00:00:59,029 --> 00:00:53,270
steve cell also from jpl he is on the

17
00:01:02,869 --> 00:01:01,029
richard cook from the jet propulsion

18
00:01:06,710 --> 00:01:02,879
laboratory he's the deputy project

19
00:01:12,469 --> 00:01:09,590
and ashwin vasavada also from jpl the

20
00:01:14,070 --> 00:01:12,479
msl deputy project scientist and i will

21
00:01:15,990 --> 00:01:14,080
begin with doug mcquestion thank you

22
00:01:20,870 --> 00:01:16,000
veronica

23
00:01:23,270 --> 00:01:20,880
one day 12 hours 59 minutes 45 seconds

24
00:01:26,390 --> 00:01:23,280
who's counting

25
00:01:27,749 --> 00:01:26,400
anyway it gets scarier every day

26
00:01:29,030 --> 00:01:27,759
so i want to start actually with

27
00:01:30,230 --> 00:01:29,040
something a little different here this

28
00:01:31,990 --> 00:01:30,240
morning i'm going to start with what's

29
00:01:34,310 --> 00:01:32,000
going on with the orbiters

30
00:01:36,230 --> 00:01:34,320
so odyssey's in good shape i mentioned

31
00:01:39,270 --> 00:01:36,240
press commerce two days ago that it was

32
00:01:41,030 --> 00:01:39,280
now in position to collect the telemetry

33
00:01:41,990 --> 00:01:41,040
and beam it back to us in a bent pipe

34
00:01:45,350 --> 00:01:42,000
mode

35
00:01:47,030 --> 00:01:45,360
mro started its uh started its edl

36
00:01:48,710 --> 00:01:47,040
sequence yesterday

37
00:01:51,109 --> 00:01:48,720
and what i want to show is a quick

38
00:01:53,429 --> 00:01:51,119

animation of what at least mro is going

39
00:01:56,069 --> 00:01:53,439
to go through to cover

40
00:01:58,069 --> 00:01:56,079
the msl entry so if we can bring this

41
00:01:59,990 --> 00:01:58,079
first animation up

42
00:02:00,950 --> 00:02:00,000
what you're seeing is a

43
00:02:03,109 --> 00:02:00,960
video

44
00:02:06,389 --> 00:02:03,119
imaging of

45
00:02:08,469 --> 00:02:06,399
of mro the red vector is the minus x of

46
00:02:10,550 --> 00:02:08,479
the spacecraft what's important is

47
00:02:12,790 --> 00:02:10,560
the green vector which is the pointing

48
00:02:14,790 --> 00:02:12,800
angle of the highrise imager and you'll

49
00:02:17,030 --> 00:02:14,800
notice the spacecraft flops around quite

50
00:02:18,229 --> 00:02:17,040
a bit this is both to keep the sun in

51
00:02:19,589 --> 00:02:18,239
line

52
00:02:22,070 --> 00:02:19,599
as well as

53
00:02:24,790 --> 00:02:22,080
pointing down you see msl coming in in

54
00:02:28,309 --> 00:02:24,800
the pink as it lands and we're going to

55
00:02:30,790 --> 00:02:28,319
attempt to have high rise point at

56
00:02:33,030 --> 00:02:30,800
msl in his final phases of descent and

57
00:02:34,630 --> 00:02:33,040
get an image of it going down this is

58
00:02:36,470 --> 00:02:34,640
going to be difficult as you can see the

59
00:02:38,630 --> 00:02:36,480
spacecraft does a lot of gyrating

60
00:02:40,390 --> 00:02:38,640
related to gymnastics if you will since

61
00:02:42,150 --> 00:02:40,400
we're in the olympic season

62
00:02:44,390 --> 00:02:42,160
uh but it's a pretty challenging thing

63
00:02:45,750 --> 00:02:44,400

that it's doing uh the teams worked

64
00:02:47,350 --> 00:02:45,760
really hard and the odyssey team has

65
00:02:48,630 --> 00:02:47,360
worked equally hard on their system so

66
00:02:50,869 --> 00:02:48,640
these guys

67
00:02:52,869 --> 00:02:50,879
and gals and their their uh spacecraft

68
00:02:54,150 --> 00:02:52,879
are ready to do this and and i really

69
00:02:55,509 --> 00:02:54,160
hope we can get this image but it's

70
00:02:57,030 --> 00:02:55,519
going to be tough we were really lucky

71
00:02:58,790 --> 00:02:57,040
on phoenix getting that one we'll see if

72
00:03:00,790 --> 00:02:58,800
we do it this time so that's kind of a

73
00:03:02,710 --> 00:03:00,800
fun video

74
00:03:04,949 --> 00:03:02,720
back to msl

75
00:03:06,149 --> 00:03:04,959
like all missions msl started with

76
00:03:08,390 --> 00:03:06,159
something that was pretty scary and

77
00:03:10,470 --> 00:03:08,400
pretty risky and that was called launch

78
00:03:12,790 --> 00:03:10,480
unlike most missions

79
00:03:15,430 --> 00:03:12,800
we haven't finished the scary and risky

80
00:03:17,030 --> 00:03:15,440
stuff yet msl still has to put curiosity

81
00:03:18,470 --> 00:03:17,040
on the surface after it goes through the

82
00:03:19,990 --> 00:03:18,480
atmosphere

83
00:03:21,910 --> 00:03:20,000
are seven minutes of terror which you'll

84
00:03:23,670 --> 00:03:21,920
continue to hear about so can we do this

85
00:03:25,350 --> 00:03:23,680
yeah i think we can do this

86
00:03:28,070 --> 00:03:25,360
i'm confident the team's done an amazing

87
00:03:29,350 --> 00:03:28,080
job we have the a-plus team on this

88
00:03:31,190 --> 00:03:29,360

they've done everything possible to

89
00:03:33,110 --> 00:03:31,200
ensure success but that risk still

90
00:03:35,030 --> 00:03:33,120
exists it's going to be tough

91
00:03:36,149 --> 00:03:35,040
if we're not successful

92
00:03:37,670 --> 00:03:36,159
we're going to learn we're going to

93
00:03:40,070 --> 00:03:37,680
learn from this we've learned in the

94
00:03:41,830 --> 00:03:40,080
past we've recovered from it we'll pick

95
00:03:43,350 --> 00:03:41,840
ourselves up we'll dust ourselves off

96
00:03:45,190 --> 00:03:43,360
we'll look at this and do something

97
00:03:47,030 --> 00:03:45,200
again we'll do it again this will not be

98
00:03:48,789 --> 00:03:47,040
the end

99
00:03:50,309 --> 00:03:48,799
human spirit gets driven by these kinds

100
00:03:53,350 --> 00:03:50,319
of challenges and these are the kind of

101
00:03:55,190 --> 00:03:53,360
challenges that force us drive us to

102
00:03:56,789 --> 00:03:55,200
explore to explore our surroundings and

103
00:04:00,149 --> 00:03:56,799
understand what's out there and

104
00:04:02,149 --> 00:04:00,159
obviously look at why are we alone

105
00:04:04,229 --> 00:04:02,159
let's bring up this next graphic but to

106
00:04:05,910 --> 00:04:04,239
tell you how hard this is

107
00:04:07,750 --> 00:04:05,920
this is the scoreboard

108
00:04:10,229 --> 00:04:07,760
we are behind

109
00:04:11,270 --> 00:04:10,239
mars has been winning the global success

110
00:04:14,229 --> 00:04:11,280
rate

111
00:04:18,069 --> 00:04:14,239
is about 40 percent this is orbiter's

112
00:04:19,830 --> 00:04:18,079
landers flybys etc so it's tough this is

113
00:04:20,789 --> 00:04:19,840

the most challenging landing we've ever

114
00:04:22,710 --> 00:04:20,799
attempted

115
00:04:24,710 --> 00:04:22,720
so we'll see how this goes we're all

116
00:04:26,150 --> 00:04:24,720
looking forward to it i'm confident i'm

117
00:04:27,670 --> 00:04:26,160
proud of this team and what they've done

118
00:04:29,590 --> 00:04:27,680
and i'm proud of their readiness it's

119
00:04:31,749 --> 00:04:29,600
pretty exciting

120
00:04:34,950 --> 00:04:31,759
so at the end of this little little talk

121
00:04:37,110 --> 00:04:34,960
on phoenix i quoted a rolling stones

122
00:04:40,310 --> 00:04:37,120
item so to continue that tradition at

123
00:04:42,070 --> 00:04:40,320
this point i'm using tom petty today

124
00:04:43,590 --> 00:04:42,080
so we're learning to fly and we don't

125
00:04:46,550 --> 00:04:43,600
have wings

126
00:04:47,670 --> 00:04:46,560
getting down is the hardest thing

127
00:04:50,230 --> 00:04:47,680
with that

128
00:04:52,070 --> 00:04:50,240
over to arthur

129
00:04:55,189 --> 00:04:52,080
no problem okay

130
00:04:57,270 --> 00:04:55,199
um my name is arthur amador i'm the msl

131
00:04:59,909 --> 00:04:57,280
cruise edl mission manager and i'll give

132
00:05:02,310 --> 00:04:59,919
a quick summary of our current status

133
00:05:03,670 --> 00:05:02,320
recent events and upcoming operational

134
00:05:06,150 --> 00:05:03,680
activities

135
00:05:08,950 --> 00:05:06,160
so regarding our current status we're at

136
00:05:10,469 --> 00:05:08,960
entry minus 36 hours the spacecraft and

137
00:05:13,110 --> 00:05:10,479
ground systems are all healthy and

138
00:05:16,070 --> 00:05:13,120

performing as expected the spacecraft is

139
00:05:18,550 --> 00:05:16,080
now in the edl approach configuration

140
00:05:20,310 --> 00:05:18,560
in our final approach orientation

141
00:05:21,990 --> 00:05:20,320
pointing our medium gain antenna within

142
00:05:24,230 --> 00:05:22,000
a degree of the earth

143
00:05:26,950 --> 00:05:24,240
we've got a strong telecom signal

144
00:05:29,510 --> 00:05:26,960
receiving data at 2000 bits per second

145
00:05:30,469 --> 00:05:29,520
over the dsn antennas of madrid as we

146
00:05:32,790 --> 00:05:30,479
speak

147
00:05:35,270 --> 00:05:32,800
the power subsystem is healthy our rover

148
00:05:37,830 --> 00:05:35,280
batteries are charged to 100

149
00:05:39,670 --> 00:05:37,840
the thermal and propulsion systems are

150
00:05:40,710 --> 00:05:39,680
nominal with stable temperatures and

151
00:05:43,189 --> 00:05:40,720
pressures

152
00:05:45,670 --> 00:05:43,199
and the dsn continues to perform well

153
00:05:47,990 --> 00:05:45,680
tracking the spacecraft continuously

154
00:05:50,310 --> 00:05:48,000
and conducting two differential ranging

155
00:05:54,710 --> 00:05:50,320
passes per day

156
00:05:58,550 --> 00:05:56,710
so with a little under

157
00:05:59,990 --> 00:05:58,560
four and a half million kilometers to go

158
00:06:01,830 --> 00:06:00,000
to reach mars

159
00:06:04,790 --> 00:06:01,840
we've traveled now

160
00:06:06,870 --> 00:06:04,800
560 million kilometers around the sun

161
00:06:09,270 --> 00:06:06,880
since launch eight months ago

162
00:06:11,510 --> 00:06:09,280
and we're now right on target

163
00:06:12,870 --> 00:06:11,520

to fly through the eye of the needle

164
00:06:14,710 --> 00:06:12,880
that is our target at the top of the

165
00:06:17,270 --> 00:06:14,720
mars atmosphere

166
00:06:18,230 --> 00:06:17,280
the target is a box

167
00:06:20,469 --> 00:06:18,240
that's

168
00:06:21,909 --> 00:06:20,479
three kilometers by 12 kilometers in

169
00:06:24,870 --> 00:06:21,919
dimension

170
00:06:27,830 --> 00:06:24,880
and we're flying right through it

171
00:06:29,510 --> 00:06:27,840
okay thank you for that graphic

172
00:06:32,710 --> 00:06:29,520
events over the last few days on the

173
00:06:34,150 --> 00:06:32,720
spacecraft have been nominal and quiet

174
00:06:35,270 --> 00:06:34,160
as nominal and quiet as we could have

175
00:06:37,510 --> 00:06:35,280
hoped for

176
00:06:39,590 --> 00:06:37,520
the spacecraft has been under the atomic

177
00:06:40,629 --> 00:06:39,600
autonomous control of the onboard edl

178
00:06:42,309 --> 00:06:40,639
sequence

179
00:06:44,629 --> 00:06:42,319
since monday evening

180
00:06:45,990 --> 00:06:44,639
and has been executing its actions as

181
00:06:47,990 --> 00:06:46,000
planned

182
00:06:49,589 --> 00:06:48,000
our trajectory inbound to mars has been

183
00:06:52,150 --> 00:06:49,599
right down the pipe

184
00:06:54,230 --> 00:06:52,160
so we canceled last night's opportunity

185
00:06:56,150 --> 00:06:54,240
to perform our fifth trajectory

186
00:06:58,070 --> 00:06:56,160
correction maneuver

187
00:06:59,749 --> 00:06:58,080
during the hours that we have left here

188
00:07:01,350 --> 00:06:59,759

before landing the flight team will

189
00:07:02,950 --> 00:07:01,360
remain vigilant

190
00:07:05,029 --> 00:07:02,960
monitoring and assessing the health of

191
00:07:06,790 --> 00:07:05,039
the spacecraft and tracking its

192
00:07:08,629 --> 00:07:06,800
trajectory and preparing

193
00:07:10,150 --> 00:07:08,639
any necessary changes to guidance and

194
00:07:12,070 --> 00:07:10,160
entry parameters

195
00:07:15,110 --> 00:07:12,080
we have several opportunities to make

196
00:07:16,550 --> 00:07:15,120
final parameter updates one today

197
00:07:19,189 --> 00:07:16,560
and two additional opportunities

198
00:07:21,670 --> 00:07:19,199
tomorrow if we need them

199
00:07:24,550 --> 00:07:21,680
we have one more significant activity to

200
00:07:26,629 --> 00:07:24,560
perform with the spacecraft late tonight

201
00:07:27,990 --> 00:07:26,639
and that's to command the final enable

202
00:07:29,749 --> 00:07:28,000
and activation

203
00:07:31,990 --> 00:07:29,759
of the contingency software on our

204
00:07:33,670 --> 00:07:32,000
backup computer

205
00:07:36,390 --> 00:07:33,680
the team's confident

206
00:07:37,670 --> 00:07:36,400
and thrilled to be finally arriving at

207
00:07:39,350 --> 00:07:37,680
mars

208
00:07:41,589 --> 00:07:39,360
and we're reminding ourselves to breathe

209
00:07:43,270 --> 00:07:41,599
every so often

210
00:07:45,589 --> 00:07:43,280
our system's in place

211
00:07:47,749 --> 00:07:45,599
and we're ready to go

212
00:07:49,110 --> 00:07:47,759
so i'll pass it on the steep cell

213
00:07:51,189 --> 00:07:49,120

an adl team

214
00:07:52,790 --> 00:07:51,199
good morning my name is steve sell i'm

215
00:07:55,909 --> 00:07:52,800
on the entry descent and landing team

216
00:07:57,270 --> 00:07:55,919
here at jpl for curiosity and

217
00:07:59,670 --> 00:07:57,280
like arthur i just have to keep

218
00:08:02,230 --> 00:07:59,680
reminding myself to keep breathing

219
00:08:04,230 --> 00:08:02,240
i only got 36 more hours to go

220
00:08:06,150 --> 00:08:04,240
uh and so i just want to walk everyone

221
00:08:07,830 --> 00:08:06,160
through what we can expect to see and

222
00:08:09,749 --> 00:08:07,840
hear tomorrow night as we go through

223
00:08:11,110 --> 00:08:09,759
entry descent and landing

224
00:08:13,110 --> 00:08:11,120
as you remember

225
00:08:14,469 --> 00:08:13,120
because we've probably been talking

226
00:08:15,830 --> 00:08:14,479
about this for

227
00:08:19,029 --> 00:08:15,840
quite a bit over the past few days

228
00:08:21,430 --> 00:08:19,039
there's several different phases of edl

229
00:08:23,270 --> 00:08:21,440
and at first we enter the mars

230
00:08:25,430 --> 00:08:23,280
atmosphere we're going about 13 000

231
00:08:27,830 --> 00:08:25,440
miles an hour when we do that and

232
00:08:29,749 --> 00:08:27,840
as we slow down with the initial drag on

233
00:08:31,670 --> 00:08:29,759
the atmosphere

234
00:08:33,829 --> 00:08:31,680
that's our what we call the entry phase

235
00:08:36,070 --> 00:08:33,839
and during that time we're doing uh our

236
00:08:38,070 --> 00:08:36,080
hypersonic guidance maneuvering so we're

237
00:08:40,230 --> 00:08:38,080
basically carving back and forth through

238
00:08:41,430 --> 00:08:40,240

the atmosphere to control how fast we're

239
00:08:43,430 --> 00:08:41,440
slowing down

240
00:08:44,949 --> 00:08:43,440
to get ready to deploy the parachute at

241
00:08:46,949 --> 00:08:44,959
about a thousand miles an hour and then

242
00:08:47,990 --> 00:08:46,959
we're on the parachute for a while until

243
00:08:50,550 --> 00:08:48,000
we

244
00:08:52,150 --> 00:08:50,560
get a good radar solution on the ground

245
00:08:53,750 --> 00:08:52,160
once we get that radar solution on the

246
00:08:55,430 --> 00:08:53,760
ground we wait until we're about a mile

247
00:08:58,389 --> 00:08:55,440
off the ground and then we cut free from

248
00:08:59,269 --> 00:08:58,399
the parachute do our power descent

249
00:09:01,030 --> 00:08:59,279
and

250
00:09:03,269 --> 00:09:01,040
finally ending in the wonderful sky

251
00:09:05,590 --> 00:09:03,279
crane maneuver where we lower the rover

252
00:09:08,310 --> 00:09:05,600
on three bridles underneath the descent

253
00:09:10,630 --> 00:09:08,320
stage and set it gently on the ground

254
00:09:13,590 --> 00:09:10,640
and the descent stage then flies away to

255
00:09:16,150 --> 00:09:13,600
a safe landing about 500 meters or so

256
00:09:17,350 --> 00:09:16,160
from the from where we place the rover

257
00:09:19,829 --> 00:09:17,360
so

258
00:09:21,590 --> 00:09:19,839
like you all i'm going to be

259
00:09:23,430 --> 00:09:21,600
you know eyes peeled to the to the

260
00:09:25,030 --> 00:09:23,440
monitors for this whole thing and so i

261
00:09:26,949 --> 00:09:25,040
just want to tell you how we're going to

262
00:09:29,030 --> 00:09:26,959
be how we're going to be watching this

263
00:09:31,030 --> 00:09:29,040

and uh we actually have four different

264
00:09:33,990 --> 00:09:31,040
ways that uh that signals are coming

265
00:09:35,829 --> 00:09:34,000
back to uh to earth and um so there's a

266
00:09:38,630 --> 00:09:35,839
lot going on here i'll try my best to

267
00:09:40,949 --> 00:09:38,640
explain it pretty clearly i just thought

268
00:09:42,230 --> 00:09:40,959
at first i would uh point to some things

269
00:09:43,750 --> 00:09:42,240
on the spacecraft here that are of

270
00:09:45,509 --> 00:09:43,760
interest for the communications during

271
00:09:47,829 --> 00:09:45,519
entry descent and landing the first is

272
00:09:50,550 --> 00:09:47,839
this antenna that's tilted out the side

273
00:09:52,150 --> 00:09:50,560
of the parachute cone here that that

274
00:09:53,910 --> 00:09:52,160
antenna will be transmitting on the

275
00:09:55,269 --> 00:09:53,920
x-band and i'll get into that in a

276
00:09:57,590 --> 00:09:55,279
little bit um but that will be

277
00:09:58,470 --> 00:09:57,600
transmitting tones back to uh earth and

278
00:10:02,310 --> 00:09:58,480
we've

279
00:10:04,069 --> 00:10:02,320
missions and there's an antenna that

280
00:10:07,190 --> 00:10:04,079
wraps all around the parachute cone here

281
00:10:09,030 --> 00:10:07,200
and that will be transmitting on the uhf

282
00:10:10,150 --> 00:10:09,040
frequency and that will be transmitting

283
00:10:12,710 --> 00:10:10,160
data

284
00:10:15,750 --> 00:10:12,720
back to earth or to the relay orbiters

285
00:10:18,069 --> 00:10:15,760
that doug mentioned before

286
00:10:20,069 --> 00:10:18,079
so the tones are basically a series of

287
00:10:21,269 --> 00:10:20,079
beeps from the spacecraft we don't

288
00:10:23,350 --> 00:10:21,279

actually hear them as tones in the

289
00:10:25,110 --> 00:10:23,360
control room we actually just see them

290
00:10:27,590 --> 00:10:25,120
appear as numbers on the on the screen

291
00:10:29,269 --> 00:10:27,600
but there's no actual uh con uh

292
00:10:31,269 --> 00:10:29,279
information or data transferred in those

293
00:10:33,509 --> 00:10:31,279
tones they're just markers of i've

294
00:10:35,110 --> 00:10:33,519
gotten this far in the entry descent and

295
00:10:38,150 --> 00:10:35,120
landing sequence

296
00:10:39,910 --> 00:10:38,160
the uhf is a more rich data set then we

297
00:10:41,829 --> 00:10:39,920
can actually send numbers back so we get

298
00:10:44,310 --> 00:10:41,839
things like altitudes and velocities

299
00:10:45,910 --> 00:10:44,320
positions and and more rich data like

300
00:10:47,269 --> 00:10:45,920
that

301
00:10:50,230 --> 00:10:47,279
so

302
00:10:52,470 --> 00:10:50,240
how this will play out on

303
00:10:54,630 --> 00:10:52,480
on edl night tomorrow night

304
00:10:57,269 --> 00:10:54,640
we actually have a unique timing where

305
00:10:58,870 --> 00:10:57,279
we've tweaked the orbits of the odyssey

306
00:11:01,190 --> 00:10:58,880
spacecraft and the mars reconnaissance

307
00:11:03,030 --> 00:11:01,200
orbiter so that they will pass over the

308
00:11:04,870 --> 00:11:03,040
landing site as we're landing there and

309
00:11:07,430 --> 00:11:04,880
we'll use both of those to

310
00:11:08,790 --> 00:11:07,440
relay our uhf data back

311
00:11:11,509 --> 00:11:08,800
at different time scales and i'll get

312
00:11:13,110 --> 00:11:11,519
into that in a second

313
00:11:17,030 --> 00:11:13,120

but if we could bring up the the first

314
00:11:18,710 --> 00:11:17,040
video um this demonstrates the

315
00:11:20,710 --> 00:11:18,720
the sequence of events as we're

316
00:11:21,670 --> 00:11:20,720
approaching mars you can see msl there

317
00:11:23,509 --> 00:11:21,680
with its

318
00:11:24,949 --> 00:11:23,519
uh with leaving a little trail as it's

319
00:11:26,550 --> 00:11:24,959
coming in

320
00:11:28,870 --> 00:11:26,560
so gale crater appears on the right of

321
00:11:31,190 --> 00:11:28,880
the screen you'll see it marked there

322
00:11:33,590 --> 00:11:31,200
so this is coming in uh from the west to

323
00:11:35,590 --> 00:11:33,600
the east and you'll see mro will pass

324
00:11:36,949 --> 00:11:35,600
over the landing site from the south to

325
00:11:39,030 --> 00:11:36,959
the north

326
00:11:41,269 --> 00:11:39,040
and you'll see odyssey come in from the

327
00:11:43,430 --> 00:11:41,279
north to the south you'll see it in a

328
00:11:45,590 --> 00:11:43,440
second and msl is

329
00:11:48,630 --> 00:11:45,600
just about landing it touches down

330
00:11:51,350 --> 00:11:48,640
almost when mro is directly overhead

331
00:11:55,190 --> 00:11:51,360
and odyssey is passing off

332
00:11:57,430 --> 00:11:55,200
a little bit more to the east

333
00:11:58,389 --> 00:11:57,440
so that's the timing that we're using to

334
00:12:00,949 --> 00:11:58,399
uh

335
00:12:02,069 --> 00:12:00,959
to cover entry descent and landing and

336
00:12:04,069 --> 00:12:02,079
the way we're using both of those

337
00:12:06,550 --> 00:12:04,079
spacecraft is odyssey is operating in

338
00:12:08,470 --> 00:12:06,560

what we call a bent pipe mode which

339
00:12:10,870 --> 00:12:08,480
allows us to relay data back to earth in

340
00:12:12,790 --> 00:12:10,880
real time so that's what we're going to

341
00:12:14,069 --> 00:12:12,800
be glued to on the computer screens

342
00:12:15,910 --> 00:12:14,079
everybody's going to be watching that

343
00:12:17,750 --> 00:12:15,920
and we're using that to drive some

344
00:12:20,150 --> 00:12:17,760
some pretty cool animations that will

345
00:12:21,590 --> 00:12:20,160
show the telemetry and graphical form as

346
00:12:22,790 --> 00:12:21,600
it comes back so you'll actually see

347
00:12:24,710 --> 00:12:22,800
pictures of the capsule and the

348
00:12:26,710 --> 00:12:24,720
parachute and stuff like that

349
00:12:28,710 --> 00:12:26,720
and we'll actually be able to watch uh

350
00:12:29,670 --> 00:12:28,720
watch the telemetry in a in a meaningful

351
00:12:31,430 --> 00:12:29,680
way

352
00:12:34,389 --> 00:12:31,440
as it's descending

353
00:12:36,550 --> 00:12:34,399
the tones actually will

354
00:12:38,230 --> 00:12:36,560
start transmitting those about

355
00:12:40,470 --> 00:12:38,240
10 minutes before entry into the

356
00:12:42,310 --> 00:12:40,480
atmosphere and those tones are direct to

357
00:12:44,710 --> 00:12:42,320
earth so they do not get relayed through

358
00:12:46,310 --> 00:12:44,720
the orbiter the tones will keep

359
00:12:49,030 --> 00:12:46,320
the tones will keep being emitted by the

360
00:12:50,949 --> 00:12:49,040
spacecraft all the way down to until

361
00:12:53,190 --> 00:12:50,959
sometime we're on the parachute

362
00:12:54,949 --> 00:12:53,200
at that point the earth actually sets

363
00:12:56,710 --> 00:12:54,959

from view of the spacecraft and so we

364
00:12:58,069 --> 00:12:56,720
will no longer be able to receive the

365
00:12:59,509 --> 00:12:58,079
tones although the spacecraft will still

366
00:13:01,910 --> 00:12:59,519
be sending them we just

367
00:13:04,310 --> 00:13:01,920
we're kind of blocked from view

368
00:13:06,870 --> 00:13:04,320
however odyssey passing overhead will

369
00:13:08,550 --> 00:13:06,880
still continue to relay that high

370
00:13:09,829 --> 00:13:08,560
rich data set

371
00:13:11,829 --> 00:13:09,839
back to earth all the way through

372
00:13:13,750 --> 00:13:11,839
touchdown and for a few minutes after

373
00:13:15,269 --> 00:13:13,760
touchdown

374
00:13:17,910 --> 00:13:15,279
in addition to

375
00:13:20,949 --> 00:13:17,920
the tones and mro and

376
00:13:22,790 --> 00:13:20,959
odyssey we will also be making use of

377
00:13:25,030 --> 00:13:22,800
the european uh

378
00:13:27,350 --> 00:13:25,040
mars express spacecraft which will be

379
00:13:30,470 --> 00:13:27,360
recording the uhf uh

380
00:13:32,949 --> 00:13:30,480
signal and it will send what it hears

381
00:13:34,629 --> 00:13:32,959
back to back to earth uh several hours

382
00:13:36,069 --> 00:13:34,639
after landing

383
00:13:37,430 --> 00:13:36,079
uh and just to

384
00:13:38,870 --> 00:13:37,440
i know there's a lot of stuff going on

385
00:13:42,470 --> 00:13:38,880
here so we put together a little video

386
00:13:43,990 --> 00:13:42,480
to try to help explain the the sequence

387
00:13:46,470 --> 00:13:44,000
of the different timings so we can have

388
00:13:48,870 --> 00:13:46,480

the second video please

389
00:13:51,829 --> 00:13:48,880
you'll see the spacecraft entering there

390
00:13:52,790 --> 00:13:51,839
uh emitting the aquaman uhf

391
00:13:55,590 --> 00:13:52,800
tones

392
00:13:57,990 --> 00:13:55,600
and the little magenta

393
00:14:00,550 --> 00:13:58,000
or pink

394
00:14:02,870 --> 00:14:00,560
the pink tones direct to earth and you

395
00:14:04,710 --> 00:14:02,880
can see mro and odyssey passing over the

396
00:14:06,870 --> 00:14:04,720
capsule as it's landing and when it when

397
00:14:09,430 --> 00:14:06,880
odyssey gets into view of the uhf it

398
00:14:12,150 --> 00:14:09,440
then relays that back to earth and mro

399
00:14:13,189 --> 00:14:12,160
will record that uhf data and play it

400
00:14:15,110 --> 00:14:13,199
back

401
00:14:18,470 --> 00:14:15,120
a couple hours after landing

402
00:14:21,189 --> 00:14:18,480
and there you see the the dsn receiving

403
00:14:23,590 --> 00:14:21,199
that information for us to view here

404
00:14:27,030 --> 00:14:23,600
at jpl

405
00:14:30,150 --> 00:14:27,040
uh and so as i said we expect uh to have

406
00:14:31,350 --> 00:14:30,160
the odyssey bent pipe relay to us all

407
00:14:32,629 --> 00:14:31,360
the way

408
00:14:34,870 --> 00:14:32,639
through touchdown through several

409
00:14:37,430 --> 00:14:34,880
minutes after touchdown

410
00:14:39,430 --> 00:14:37,440
and then at approximately an hour and a

411
00:14:41,910 --> 00:14:39,440
half after landing odyssey will replay

412
00:14:43,430 --> 00:14:41,920
that data again back to earth everything

413
00:14:45,750 --> 00:14:43,440

it heard just as a

414
00:14:49,590 --> 00:14:45,760
another way of of getting the data back

415
00:14:52,069 --> 00:14:49,600
again mro will replay what it heard

416
00:14:54,069 --> 00:14:52,079
back to earth and that replay will start

417
00:14:55,750 --> 00:14:54,079
that replay will happen several hours

418
00:14:57,829 --> 00:14:55,760
after landing and the data will actually

419
00:14:59,350 --> 00:14:57,839
be available to us we have to go through

420
00:15:01,189 --> 00:14:59,360
a slight

421
00:15:03,189 --> 00:15:01,199
decoding process once we get that data

422
00:15:04,389 --> 00:15:03,199
down but we'll have that about 10 hours

423
00:15:06,949 --> 00:15:04,399
after landing

424
00:15:09,509 --> 00:15:06,959
and i have to say that

425
00:15:11,430 --> 00:15:09,519
i'm extremely excited to be watching all

426
00:15:13,670 --> 00:15:11,440
of this through whatever

427
00:15:14,949 --> 00:15:13,680
data we get on the screens here and i

428
00:15:16,790 --> 00:15:14,959
can't wait for all of us to see it

429
00:15:18,310 --> 00:15:16,800
happen tomorrow night and with that i'll

430
00:15:19,910 --> 00:15:18,320
turn it over to richard who'll walk you

431
00:15:21,350 --> 00:15:19,920
through the what's happening after

432
00:15:23,030 --> 00:15:21,360
touchdown

433
00:15:24,389 --> 00:15:23,040
okay well good morning everybody i'm

434
00:15:26,230 --> 00:15:24,399
richard cook i'm the deputy project

435
00:15:27,670 --> 00:15:26,240
manager i like the tractor beams in the

436
00:15:29,350 --> 00:15:27,680
video that was cool

437
00:15:31,670 --> 00:15:29,360
the uh so i'm actually going to talk

438
00:15:33,829 --> 00:15:31,680

about uh what what occurred occurs after

439
00:15:35,829 --> 00:15:33,839
landing and of course you know the big

440
00:15:37,590 --> 00:15:35,839
difference between crews

441
00:15:39,350 --> 00:15:37,600
as we are right now

442
00:15:41,110 --> 00:15:39,360
and once we land is that that our

443
00:15:43,430 --> 00:15:41,120
ability to communicate with the vehicle

444
00:15:45,590 --> 00:15:43,440
and to to see what it's doing all the

445
00:15:47,030 --> 00:15:45,600
time changes we can we can do that

446
00:15:49,430 --> 00:15:47,040
during cruise because we have at this

447
00:15:50,949 --> 00:15:49,440
point continuous uh deep space network

448
00:15:53,350 --> 00:15:50,959
tracking but once we're on the surface

449
00:15:55,590 --> 00:15:53,360
it changes uh pretty dramatically part

450
00:15:57,350 --> 00:15:55,600
of that's uh because to be honest we

451
00:16:00,310 --> 00:15:57,360
don't know exactly what steve told you

452
00:16:02,150 --> 00:16:00,320
what the plan is for for landing uh for

453
00:16:03,670 --> 00:16:02,160
communications clearly there are

454
00:16:05,910 --> 00:16:03,680
situations that will occur or

455
00:16:07,110 --> 00:16:05,920
potentially may occur during during edl

456
00:16:08,949 --> 00:16:07,120
where we won't be able to get that

457
00:16:10,470 --> 00:16:08,959
communications all the way down some of

458
00:16:12,069 --> 00:16:10,480
them we know about when the vehicle

459
00:16:14,230 --> 00:16:12,079
separates for example the rover

460
00:16:16,230 --> 00:16:14,240
separates from the descent stage uh but

461
00:16:17,829 --> 00:16:16,240
in addition there certainly are our

462
00:16:19,990 --> 00:16:17,839
situations that might come up where we

463
00:16:22,230 --> 00:16:20,000

will not get communications all the way

464
00:16:23,590 --> 00:16:22,240
through and it doesn't necessarily mean

465
00:16:24,949 --> 00:16:23,600
that something bad has happened it just

466
00:16:26,629 --> 00:16:24,959
means that we'll have to wait and hear

467
00:16:27,829 --> 00:16:26,639
from the vehicle later

468
00:16:29,189 --> 00:16:27,839
when it gets opportunities to

469
00:16:31,110 --> 00:16:29,199
communicate with us

470
00:16:32,230 --> 00:16:31,120
in the subsequent day or hours and days

471
00:16:33,590 --> 00:16:32,240
following that

472
00:16:35,350 --> 00:16:33,600
so what i'm going to talk to you about

473
00:16:37,110 --> 00:16:35,360
first is really those communications

474
00:16:39,030 --> 00:16:37,120
opportunities that occur

475
00:16:40,069 --> 00:16:39,040
right after landing and what we expect

476
00:16:41,430 --> 00:16:40,079
to see

477
00:16:43,110 --> 00:16:41,440
during those opportunities so if we

478
00:16:44,550 --> 00:16:43,120
start with the first slide

479
00:16:46,389 --> 00:16:44,560
and i have to show view graphs because

480
00:16:49,269 --> 00:16:46,399
i'm an engineer i guess and so here's my

481
00:16:51,590 --> 00:16:49,279
view graphs on what we expect to see

482
00:16:53,749 --> 00:16:51,600
in terms of communications opportunities

483
00:16:55,990 --> 00:16:53,759
on august the 6th uh

484
00:16:56,949 --> 00:16:56,000
clearly after we land uh late at night

485
00:16:59,509 --> 00:16:56,959
on the fifth

486
00:17:01,590 --> 00:16:59,519
the first opportunity uh for hearing

487
00:17:03,269 --> 00:17:01,600
from the vehicle is the one that steve

488
00:17:04,390 --> 00:17:03,279

referred to which is actually during the

489
00:17:07,270 --> 00:17:04,400
landing itself

490
00:17:09,829 --> 00:17:07,280
and we do expect odyssey to to remain

491
00:17:12,470 --> 00:17:09,839
visible for the from the rover from

492
00:17:14,309 --> 00:17:12,480
anywhere between two and five minutes

493
00:17:16,150 --> 00:17:14,319
after landing and during that time we

494
00:17:17,750 --> 00:17:16,160
should get some engineering data we hope

495
00:17:19,590 --> 00:17:17,760
to get

496
00:17:21,590 --> 00:17:19,600
an indication that the spacecraft

497
00:17:23,590 --> 00:17:21,600
transition mode into what we call the

498
00:17:25,590 --> 00:17:23,600
surface mode out of edl into surface

499
00:17:27,350 --> 00:17:25,600
mode and it's possible we also might get

500
00:17:29,750 --> 00:17:27,360
some images as well and i'll come back

501
00:17:32,470 --> 00:17:29,760
and talk to you about that in a second

502
00:17:33,430 --> 00:17:32,480
but because of the geometry that odyssey

503
00:17:35,110 --> 00:17:33,440
is in

504
00:17:37,510 --> 00:17:35,120
you saw from the video where it flies

505
00:17:38,710 --> 00:17:37,520
over kind of off to one side of the of

506
00:17:40,230 --> 00:17:38,720
the rover

507
00:17:42,310 --> 00:17:40,240
it turns out we actually have a separate

508
00:17:44,710 --> 00:17:42,320
odyssey opportunity

509
00:17:48,070 --> 00:17:44,720
later about two hours later that night

510
00:17:50,070 --> 00:17:48,080
and so it's at 12 30 in the morning

511
00:17:51,350 --> 00:17:50,080
is when we expect to to get that second

512
00:17:53,270 --> 00:17:51,360
uh pass

513
00:17:56,150 --> 00:17:53,280

it'll again be about a nine or ten

514
00:17:58,310 --> 00:17:56,160
minute overflight uh and and hopefully

515
00:17:59,990 --> 00:17:58,320
by that point we'll we are essentially

516
00:18:02,549 --> 00:18:00,000
done with all of the first set of

517
00:18:05,830 --> 00:18:02,559
activities we wanted to do on the first

518
00:18:08,310 --> 00:18:05,840
day of after landing it's the

519
00:18:11,110 --> 00:18:08,320
we land basically at about three o'clock

520
00:18:13,029 --> 00:18:11,120
3 30 on mars and so this rover has

521
00:18:15,110 --> 00:18:13,039
another hour an hour and a half of

522
00:18:16,789 --> 00:18:15,120
activity to do and then the odyssey

523
00:18:18,230 --> 00:18:16,799
overflight will occur

524
00:18:20,070 --> 00:18:18,240
and we'll basically be done with the

525
00:18:20,789 --> 00:18:20,080
things we expect to do

526
00:18:23,510 --> 00:18:20,799
the

527
00:18:24,789 --> 00:18:23,520
those uh that odyssey overflight will be

528
00:18:26,230 --> 00:18:24,799
the next opportunity to get some

529
00:18:27,350 --> 00:18:26,240
pictures back

530
00:18:29,350 --> 00:18:27,360
and again i'll talk a little bit more

531
00:18:31,110 --> 00:18:29,360
about this in a bit but we are uh in

532
00:18:34,150 --> 00:18:31,120
both of these uh

533
00:18:35,909 --> 00:18:34,160
uh two over flights that that that that

534
00:18:38,230 --> 00:18:35,919
late morning or late evening rather

535
00:18:41,510 --> 00:18:38,240
early morning uh we expect that we might

536
00:18:43,990 --> 00:18:41,520
get some black and white fisheye lens

537
00:18:45,990 --> 00:18:44,000
has cam images and i do have the rover

538
00:18:47,750 --> 00:18:46,000

here in case you guys are are

539
00:18:49,669 --> 00:18:47,760
uh wondering what cameras we're going to

540
00:18:51,590 --> 00:18:49,679
be taking pictures of they're from the

541
00:18:53,990 --> 00:18:51,600
the the haz cams that are on the back of

542
00:18:56,870 --> 00:18:54,000
the vehicle here and they are black and

543
00:18:58,789 --> 00:18:56,880
white uh we might get they have covers

544
00:19:02,470 --> 00:18:58,799
on them and so we might actually get

545
00:19:04,789 --> 00:19:02,480
images uh from the first uh pass and

546
00:19:07,190 --> 00:19:04,799
right after landing through those covers

547
00:19:08,789 --> 00:19:07,200
the covers are actually transparent but

548
00:19:10,150 --> 00:19:08,799
then we'll actually deploy those covers

549
00:19:12,710 --> 00:19:10,160
and we'll take some more pictures and so

550
00:19:15,430 --> 00:19:12,720
we may see those uh those images in the

551
00:19:17,029 --> 00:19:15,440
second odyssey pass that occurs um late

552
00:19:19,350 --> 00:19:17,039
at night

553
00:19:22,070 --> 00:19:19,360
then basically the way that the mars and

554
00:19:24,310 --> 00:19:22,080
the orbiters work is that the spacecraft

555
00:19:26,150 --> 00:19:24,320
is the rover's sitting on the surface

556
00:19:28,310 --> 00:19:26,160
and the orbiters continue to go around

557
00:19:30,230 --> 00:19:28,320
but they're not lined up with where the

558
00:19:33,190 --> 00:19:30,240
with where the vehicle is and so we have

559
00:19:35,430 --> 00:19:33,200
to wait 12 hours essentially for mars to

560
00:19:37,510 --> 00:19:35,440
rotate under the vehicle under the the

561
00:19:39,270 --> 00:19:37,520
orbiters and then we'll get our next

562
00:19:40,789 --> 00:19:39,280
opportunity to communicate and because

563
00:19:43,430 --> 00:19:40,799

we have two orbiters

564
00:19:45,909 --> 00:19:43,440
we get two almost exactly the same time

565
00:19:47,510 --> 00:19:45,919
the next morning here on earth 11 30 in

566
00:19:49,990 --> 00:19:47,520
the morning 11 40 in the morning for

567
00:19:51,430 --> 00:19:50,000
odyssey and for mro and so again that

568
00:19:53,430 --> 00:19:51,440
would be the next time where we would

569
00:19:55,110 --> 00:19:53,440
hope to hear from the vehicle

570
00:19:57,350 --> 00:19:55,120
and again depending on what has happened

571
00:19:58,470 --> 00:19:57,360
during edl as well as what happened in

572
00:20:00,390 --> 00:19:58,480
those first few

573
00:20:01,830 --> 00:20:00,400
minutes after landing

574
00:20:03,830 --> 00:20:01,840
this could be in fact the first time we

575
00:20:05,110 --> 00:20:03,840
hear from it depending on what on what

576
00:20:07,029 --> 00:20:05,120
has occurred

577
00:20:09,029 --> 00:20:07,039
so those are the the overflights from

578
00:20:10,789 --> 00:20:09,039
the orbiters in addition we have the

579
00:20:12,789 --> 00:20:10,799
ability with the rover using its

580
00:20:14,630 --> 00:20:12,799
high-gain antenna you see here to

581
00:20:16,390 --> 00:20:14,640
communicate and its low gain antenna to

582
00:20:18,390 --> 00:20:16,400
communicate which is right here to

583
00:20:20,549 --> 00:20:18,400
communicate with the earth directly to

584
00:20:23,430 --> 00:20:20,559
the deep space network and so it because

585
00:20:25,029 --> 00:20:23,440
that's a very uh much farther distance

586
00:20:27,590 --> 00:20:25,039
the vehicle's transmitter is not that

587
00:20:30,390 --> 00:20:27,600
strong uh we we don't actually expect to

588
00:20:31,270 --> 00:20:30,400

get data uh from that uh communication

589
00:20:33,029 --> 00:20:31,280
paths

590
00:20:35,510 --> 00:20:33,039
path but what we do is what we call a

591
00:20:37,750 --> 00:20:35,520
beep which is a little bit like a

592
00:20:39,990 --> 00:20:37,760
tone during edl where the vehicle

593
00:20:41,830 --> 00:20:40,000
essentially just transmits a signal and

594
00:20:43,830 --> 00:20:41,840
it through the logan antenna and it

595
00:20:45,830 --> 00:20:43,840
tells us that it's that it's there and

596
00:20:47,990 --> 00:20:45,840
that it's it's running the sequence that

597
00:20:49,750 --> 00:20:48,000
we expected it to see and so that will

598
00:20:51,510 --> 00:20:49,760
be the first time that we we get a

599
00:20:53,750 --> 00:20:51,520
direct communication without going

600
00:20:55,350 --> 00:20:53,760
through the orbiters and it'll occur

601
00:20:58,070 --> 00:20:55,360
depending on what path we're on

602
00:21:00,789 --> 00:20:58,080
somewhere in the 5 to 6 pm

603
00:21:02,549 --> 00:21:00,799
the following night next monday monday

604
00:21:03,430 --> 00:21:02,559
night so that would be our first direct

605
00:21:05,110 --> 00:21:03,440
path

606
00:21:07,510 --> 00:21:05,120
assuming that we do hear from the

607
00:21:09,669 --> 00:21:07,520
vehicle we then transition into what i

608
00:21:11,270 --> 00:21:09,679
would call normal surface operations and

609
00:21:12,950 --> 00:21:11,280
the big difference between normal

610
00:21:15,190 --> 00:21:12,960
surface operations and what we're doing

611
00:21:16,630 --> 00:21:15,200
now again is really the uncertainty

612
00:21:18,470 --> 00:21:16,640
there's just lots of things that are

613
00:21:20,950 --> 00:21:18,480

different about this vehicle on the

614
00:21:23,029 --> 00:21:20,960
surface it has uh you know different

615
00:21:24,470 --> 00:21:23,039
power configuration it has the

616
00:21:25,750 --> 00:21:24,480
environment that it's in we don't know

617
00:21:26,470 --> 00:21:25,760
anything about

618
00:21:28,470 --> 00:21:26,480
so

619
00:21:30,710 --> 00:21:28,480
there is a lot of uncertainty into how

620
00:21:32,630 --> 00:21:30,720
quickly we'll be able to do things but

621
00:21:34,390 --> 00:21:32,640
if we go to the next chart

622
00:21:36,630 --> 00:21:34,400
i wanted to give you some idea of kind

623
00:21:38,870 --> 00:21:36,640
of what the plan is and you'll hear lots

624
00:21:40,549 --> 00:21:38,880
more about all this each day as we go

625
00:21:42,230 --> 00:21:40,559
along from from mike watkins and

626
00:21:44,710 --> 00:21:42,240
jennifer prosper the mission managers as

627
00:21:46,630 --> 00:21:44,720
to what the plan is each day but i kind

628
00:21:47,990 --> 00:21:46,640
of wanted to give you the big picture

629
00:21:49,669 --> 00:21:48,000
view of what we're going to try to

630
00:21:50,710 --> 00:21:49,679
accomplish as we get through the first

631
00:21:52,789 --> 00:21:50,720
few days

632
00:21:54,710 --> 00:21:52,799
so the first day

633
00:21:56,950 --> 00:21:54,720
you know as i said after we land is

634
00:21:58,710 --> 00:21:56,960
really just to to get the the vehicle

635
00:22:00,470 --> 00:21:58,720
stable on the surface

636
00:22:02,230 --> 00:22:00,480
and it's also then to get prepared to

637
00:22:03,909 --> 00:22:02,240
deploy the high gain antenna we do

638
00:22:05,990 --> 00:22:03,919

communicate with the high gain antenna

639
00:22:08,789 --> 00:22:06,000
but it requires knowing where the

640
00:22:10,789 --> 00:22:08,799
vehicle is uh in order to point the high

641
00:22:11,990 --> 00:22:10,799
gain very precisely at the earth and so

642
00:22:13,990 --> 00:22:12,000
the first thing we need to do is to

643
00:22:15,430 --> 00:22:14,000
deploy it and then to figure out

644
00:22:18,230 --> 00:22:15,440
essentially where to point it so that we

645
00:22:20,070 --> 00:22:18,240
can communicate directly uh from the to

646
00:22:22,070 --> 00:22:20,080
the earth and as well as send commands

647
00:22:23,990 --> 00:22:22,080
through the high gain antenna the next

648
00:22:25,190 --> 00:22:24,000
day we would then deploy the mast the

649
00:22:26,789 --> 00:22:25,200
rsm

650
00:22:29,110 --> 00:22:26,799
and we uh

651
00:22:31,270 --> 00:22:29,120
that will give us the ability to uh take

652
00:22:32,950 --> 00:22:31,280
pictures with some of the cameras uh

653
00:22:35,029 --> 00:22:32,960
that haven't that aren't accessible

654
00:22:37,110 --> 00:22:35,039
otherwise um so that's why for example

655
00:22:38,950 --> 00:22:37,120
our first pictures are the has cams but

656
00:22:41,270 --> 00:22:38,960
after a couple days we should be able to

657
00:22:43,590 --> 00:22:41,280
take you know navcam images and begin to

658
00:22:45,750 --> 00:22:43,600
do mass cam images as well

659
00:22:47,350 --> 00:22:45,760
on the the third day we will do a check

660
00:22:48,950 --> 00:22:47,360
out of all the instruments just to make

661
00:22:50,470 --> 00:22:48,960
sure that they're all still functioning

662
00:22:52,310 --> 00:22:50,480
uh sort of a

663
00:22:54,230 --> 00:22:52,320

very simple aliveness test for the

664
00:22:56,549 --> 00:22:54,240
instruments and as i mentioned will be

665
00:22:58,070 --> 00:22:56,559
our first chance to take a panorama of

666
00:23:01,029 --> 00:22:58,080
we'll have gotten these little postcards

667
00:23:02,470 --> 00:23:01,039
of of the area in front of the rover but

668
00:23:04,870 --> 00:23:02,480
this will give us a chance to get our

669
00:23:06,549 --> 00:23:04,880
first 360 panorama

670
00:23:08,390 --> 00:23:06,559
then on the on the fourth day we

671
00:23:11,029 --> 00:23:08,400
basically have a quiet day the panorama

672
00:23:11,990 --> 00:23:11,039
is a big set of pictures takes up a lot

673
00:23:13,909 --> 00:23:12,000
of data

674
00:23:15,750 --> 00:23:13,919
volume and so we want to essentially not

675
00:23:17,590 --> 00:23:15,760
do a lot else other than just send that

676
00:23:19,590 --> 00:23:17,600
data down

677
00:23:21,430 --> 00:23:19,600
and and have it on the ground so that we

678
00:23:22,789 --> 00:23:21,440
can begin to plan what to do long term

679
00:23:24,710 --> 00:23:22,799
with the mission

680
00:23:26,870 --> 00:23:24,720
once we get past that then we transition

681
00:23:28,950 --> 00:23:26,880
to an important engineering activity

682
00:23:30,390 --> 00:23:28,960
that will take several more days

683
00:23:32,549 --> 00:23:30,400
which is that we have a set of flight

684
00:23:34,630 --> 00:23:32,559
software which we've used during cruise

685
00:23:36,149 --> 00:23:34,640
and the landing event but it doesn't

686
00:23:37,750 --> 00:23:36,159
have all of the functionality that we

687
00:23:40,070 --> 00:23:37,760
want to use for the surface and so we

688
00:23:42,230 --> 00:23:40,080

want to transition flight software uh

689
00:23:43,669 --> 00:23:42,240
versions basically the flight software

690
00:23:45,350 --> 00:23:43,679
version that we're transitioning to is

691
00:23:46,630 --> 00:23:45,360
already on the spacecraft it's already

692
00:23:48,549 --> 00:23:46,640
been loaded up there but it's not

693
00:23:50,070 --> 00:23:48,559
running it's not active and so it will

694
00:23:52,230 --> 00:23:50,080
take us several days actually to

695
00:23:53,430 --> 00:23:52,240
transition over to it and begin to use

696
00:23:55,350 --> 00:23:53,440
it

697
00:23:57,350 --> 00:23:55,360
if we'll go to the next chart then

698
00:23:58,950 --> 00:23:57,360
uh this i kind of talked about already

699
00:24:01,510 --> 00:23:58,960
but just to talk a little more about the

700
00:24:02,710 --> 00:24:01,520
products we expect to see um as we go

701
00:24:04,789 --> 00:24:02,720
through this and and there have been

702
00:24:06,149 --> 00:24:04,799
various uh press releases already

703
00:24:08,870 --> 00:24:06,159
talking about this at some level but

704
00:24:10,789 --> 00:24:08,880
just to reiterate the the main idea for

705
00:24:13,110 --> 00:24:10,799
the first night is to get these black

706
00:24:15,110 --> 00:24:13,120
and white low resolution haz cam images

707
00:24:17,430 --> 00:24:15,120
and again they're we expect to get

708
00:24:20,710 --> 00:24:17,440
thumbnails which are very low resolution

709
00:24:22,789 --> 00:24:20,720
like the 50 bit or you know 50 pixel by

710
00:24:25,029 --> 00:24:22,799
50 pixel kind of uh

711
00:24:27,269 --> 00:24:25,039
little thumbnail postcards and then we

712
00:24:31,029 --> 00:24:27,279
hope to get uh that first night

713
00:24:33,190 --> 00:24:31,039

a more like 512 by 512 pixel uh kind of

714
00:24:34,870 --> 00:24:33,200
image again black and white looking out

715
00:24:37,190 --> 00:24:34,880
the rear of the rover

716
00:24:38,870 --> 00:24:37,200
the the uh after we get through that

717
00:24:41,110 --> 00:24:38,880
first day then we'll start to send down

718
00:24:42,789 --> 00:24:41,120
the marty images that

719
00:24:44,549 --> 00:24:42,799
mike malen talked about a couple days

720
00:24:46,230 --> 00:24:44,559
ago that's the descent imager we'll

721
00:24:49,269 --> 00:24:46,240
start sending down the thumbnails of

722
00:24:52,070 --> 00:24:49,279
that so selected uh images as we were

723
00:24:53,510 --> 00:24:52,080
going down through the landings event

724
00:24:55,350 --> 00:24:53,520
we'll take those pictures and send them

725
00:24:56,630 --> 00:24:55,360
down the first color picture we're

726
00:24:58,789 --> 00:24:56,640
actually using the

727
00:25:00,549 --> 00:24:58,799
the mali camera that's on the end of the

728
00:25:02,470 --> 00:25:00,559
of the mast and we're actually sort of

729
00:25:04,390 --> 00:25:02,480
looking out sideways out the rover and

730
00:25:06,470 --> 00:25:04,400
we'll take that our first color image

731
00:25:08,470 --> 00:25:06,480
using it and send it down on the third

732
00:25:10,870 --> 00:25:08,480
day or so and then as i mentioned we'll

733
00:25:13,029 --> 00:25:10,880
eventually get to doing the nav cam

734
00:25:14,870 --> 00:25:13,039
panorama and that will take uh several

735
00:25:16,149 --> 00:25:14,880
more days to get that's when it will

736
00:25:18,149 --> 00:25:16,159
start coming down on the ninth and it

737
00:25:19,830 --> 00:25:18,159
will take several more days to come down

738
00:25:21,909 --> 00:25:19,840

and again this is the nominal plan

739
00:25:24,070 --> 00:25:21,919
clearly if the vehicle is experiencing

740
00:25:25,909 --> 00:25:24,080
issues or if we have other uh we're

741
00:25:27,590 --> 00:25:25,919
trying to work through uh you know

742
00:25:29,029 --> 00:25:27,600
problems that will have to to change

743
00:25:30,870 --> 00:25:29,039
this plan in

744
00:25:33,029 --> 00:25:30,880
in response to that

745
00:25:34,710 --> 00:25:33,039
once we get beyond the first few days

746
00:25:36,549 --> 00:25:34,720
then i just laid out a little bit of

747
00:25:38,070 --> 00:25:36,559
what's the long-term plan for the first

748
00:25:40,390 --> 00:25:38,080
couple of months first two or three

749
00:25:42,149 --> 00:25:40,400
months and again that i think he

750
00:25:43,590 --> 00:25:42,159
probably mentioned it the other day when

751
00:25:45,990 --> 00:25:43,600
he was talking to pete tyson jr but this

752
00:25:47,750 --> 00:25:46,000
is a very complicated vehicle way more

753
00:25:49,190 --> 00:25:47,760
complicated than mer

754
00:25:50,710 --> 00:25:49,200
or other vehicles we've flown in the

755
00:25:51,669 --> 00:25:50,720
past and so it's going to take us a

756
00:25:53,669 --> 00:25:51,679
while

757
00:25:55,750 --> 00:25:53,679
to first check it out and then to get

758
00:25:57,269 --> 00:25:55,760
into the science that that john

759
00:25:59,510 --> 00:25:57,279
grotzinger and oshman and everybody else

760
00:26:01,750 --> 00:25:59,520
wants to to do this is sort of our

761
00:26:03,669 --> 00:26:01,760
nominal plan again it's it's going to be

762
00:26:05,350 --> 00:26:03,679
responsive to what we find we're going

763
00:26:07,110 --> 00:26:05,360

to spend almost the entire month of

764
00:26:09,590 --> 00:26:07,120
august really checking out this the

765
00:26:10,390 --> 00:26:09,600
vehicle uh getting the first images we

766
00:26:11,990 --> 00:26:10,400
will

767
00:26:13,750 --> 00:26:12,000
obviously be getting science data during

768
00:26:15,590 --> 00:26:13,760
that but we'll also be doing engineering

769
00:26:17,830 --> 00:26:15,600
checkouts of the instruments of the

770
00:26:19,669 --> 00:26:17,840
sampling system uh changing flight

771
00:26:21,350 --> 00:26:19,679
software doing other things

772
00:26:22,549 --> 00:26:21,360
hopefully by early september we'll be at

773
00:26:24,950 --> 00:26:22,559
the point where we can do our first

774
00:26:27,510 --> 00:26:24,960
drive uh and and have the vehicle begin

775
00:26:29,190 --> 00:26:27,520
to move around a little bit uh and then

776
00:26:31,110 --> 00:26:29,200
beyond that we'll go into the sampling

777
00:26:33,110 --> 00:26:31,120
where we first do a scoop sample in late

778
00:26:35,190 --> 00:26:33,120
september probably and then a drill

779
00:26:36,710 --> 00:26:35,200
sample sometime after that october

780
00:26:38,789 --> 00:26:36,720
november is what we're is what we're

781
00:26:40,630 --> 00:26:38,799
expecting at this point

782
00:26:42,310 --> 00:26:40,640
so i think that's my last thing on the

783
00:26:43,750 --> 00:26:42,320
planned activities let's just go to the

784
00:26:45,909 --> 00:26:43,760
next chart for a second

785
00:26:47,430 --> 00:26:45,919
quickly but to finish up uh one thing

786
00:26:49,029 --> 00:26:47,440
that people are always confused about

787
00:26:50,470 --> 00:26:49,039
and so this is our effort to try to

788
00:26:52,149 --> 00:26:50,480

explain it a little bit is the

789
00:26:55,350 --> 00:26:52,159
difference between mars time and earth

790
00:26:58,149 --> 00:26:55,360
time um it's it uh i tried to give you

791
00:26:59,990 --> 00:26:58,159
uh calendar days on the previous uh

792
00:27:02,149 --> 00:27:00,000
chart to sort of tell you when we expect

793
00:27:04,070 --> 00:27:02,159
to get things but obviously in reality

794
00:27:06,630 --> 00:27:04,080
the whole the rover and all of the

795
00:27:08,549 --> 00:27:06,640
operations team all 700 people if you

796
00:27:11,430 --> 00:27:08,559
count the scientists are all working on

797
00:27:12,950 --> 00:27:11,440
mars time where the vehicle uh you know

798
00:27:15,990 --> 00:27:12,960
to be synced up with what the vehicle is

799
00:27:18,149 --> 00:27:16,000
doing a mars day is about 40 minutes 37

800
00:27:21,269 --> 00:27:18,159
minutes longer than an earth day um and

801
00:27:24,630 --> 00:27:21,279
so in fact we that the the relative uh

802
00:27:27,269 --> 00:27:24,640
clocks uh or days shift over time uh we

803
00:27:29,430 --> 00:27:27,279
land on sol zero um and it more or less

804
00:27:31,990 --> 00:27:29,440
corresponds as i said to about three

805
00:27:35,590 --> 00:27:32,000
o'clock when we land is like three p.m

806
00:27:38,070 --> 00:27:35,600
on mars um and and and then that uh you

807
00:27:39,990 --> 00:27:38,080
know every day basically we'll we will

808
00:27:41,510 --> 00:27:40,000
that the relative

809
00:27:43,830 --> 00:27:41,520
correspondence between the earth day and

810
00:27:46,149 --> 00:27:43,840
the mars day will shift by 40 minutes

811
00:27:48,549 --> 00:27:46,159
and so you can see will be saw one uh

812
00:27:50,149 --> 00:27:48,559
august 6 primarily salt to august the

813
00:27:52,389 --> 00:27:50,159

7th eventually they'll drift to the

814
00:27:54,310 --> 00:27:52,399
point where we'll we will uh instead of

815
00:27:56,230 --> 00:27:54,320
having to have people here in the middle

816
00:27:57,990 --> 00:27:56,240
of the night to watch the rover it'll be

817
00:27:59,350 --> 00:27:58,000
during the day and that will be okay for

818
00:28:01,430 --> 00:27:59,360
a few couple of weeks and then it will

819
00:28:04,389 --> 00:28:01,440
shift back again and so you can imagine

820
00:28:07,510 --> 00:28:04,399
that it's like lose it's like losing a

821
00:28:09,669 --> 00:28:07,520
time zone every day gets pretty tiring

822
00:28:11,190 --> 00:28:09,679
but it'll be exciting because we'll be

823
00:28:14,310 --> 00:28:11,200
operating this vehicle on the surface

824
00:28:15,990 --> 00:28:14,320
and so i think that will will get us all

825
00:28:18,310 --> 00:28:16,000
inspired to work on mars time for at

826
00:28:20,549 --> 00:28:18,320
least 90 days is the current plan

827
00:28:22,070 --> 00:28:20,559
so with that i think i've spent my time

828
00:28:24,310 --> 00:28:22,080
and i will turn over to ashwin to tell

829
00:28:25,590 --> 00:28:24,320
you about the weather all right

830
00:28:29,510 --> 00:28:25,600
we always make you wait to the end for

831
00:28:32,310 --> 00:28:30,870
so um

832
00:28:34,149 --> 00:28:32,320
if you remember from a couple days ago

833
00:28:35,990 --> 00:28:34,159
i'll just go over why we care about the

834
00:28:37,750 --> 00:28:36,000
weather on mars uh there's two things

835
00:28:39,510 --> 00:28:37,760
that determine the accuracy at which we

836
00:28:41,830 --> 00:28:39,520
land uh basically the size of that

837
00:28:43,909 --> 00:28:41,840
ellipse that we're placing in that flat

838
00:28:46,470 --> 00:28:43,919

area next to gale crater

839
00:28:48,149 --> 00:28:46,480
one of them is how accurately we

840
00:28:49,669 --> 00:28:48,159
enter the mars atmosphere at the top of

841
00:28:50,630 --> 00:28:49,679
the atmosphere and as you heard from

842
00:28:52,470 --> 00:28:50,640
arthur

843
00:28:54,389 --> 00:28:52,480
we're coming in really nicely down the

844
00:28:55,510 --> 00:28:54,399
middle so now

845
00:28:57,190 --> 00:28:55,520
the next thing that could affect the

846
00:28:58,789 --> 00:28:57,200
accuracy of the landing is how well

847
00:29:00,549 --> 00:28:58,799
we've been able to predict the

848
00:29:02,950 --> 00:29:00,559
conditions at mars

849
00:29:05,029 --> 00:29:02,960
in the past few years based on data from

850
00:29:06,549 --> 00:29:05,039
previous missions that we then use to

851
00:29:07,909 --> 00:29:06,559
simulate the edl

852
00:29:09,510 --> 00:29:07,919
the entry descent landing into the

853
00:29:11,510 --> 00:29:09,520
atmosphere

854
00:29:13,029 --> 00:29:11,520
we continue to monitor that we've

855
00:29:14,470 --> 00:29:13,039
designed the spacecraft to basically

856
00:29:16,389 --> 00:29:14,480
handle all the conditions that we've

857
00:29:17,830 --> 00:29:16,399
seen in past years whether they're clear

858
00:29:19,830 --> 00:29:17,840
or dusty

859
00:29:21,590 --> 00:29:19,840
but we continue to monitor it

860
00:29:23,909 --> 00:29:21,600
in real time getting data from the

861
00:29:25,830 --> 00:29:23,919
orbiters at mars every day this week to

862
00:29:27,590 --> 00:29:25,840
make sure we understand what conditions

863
00:29:28,710 --> 00:29:27,600

the spacecraft will encounter as it's

864
00:29:31,510 --> 00:29:28,720
flying through the atmosphere and just

865
00:29:33,350 --> 00:29:31,520
how accurately we can expect to land so

866
00:29:35,669 --> 00:29:33,360
i left you two days ago with a bit of a

867
00:29:38,070 --> 00:29:35,679
cliffhanger we had seen a local dust

868
00:29:40,310 --> 00:29:38,080
storm south of gale crater

869
00:29:42,789 --> 00:29:40,320
this had the possibility of evolving in

870
00:29:45,029 --> 00:29:42,799
a few different ways uh one thing it

871
00:29:46,950 --> 00:29:45,039
could have drifted towards the landing

872
00:29:48,870 --> 00:29:46,960
site that would have been kind of the

873
00:29:51,029 --> 00:29:48,880
the worst case it would not have

874
00:29:52,630 --> 00:29:51,039
impacted our ability to land safely just

875
00:29:55,029 --> 00:29:52,640
maybe

876
00:29:57,510 --> 00:29:55,039
cause us to land less accurately than we

877
00:29:58,710 --> 00:29:57,520
would like a little further out towards

878
00:29:59,990 --> 00:29:58,720
the edges of that ellipse than the

879
00:30:02,549 --> 00:30:00,000
center

880
00:30:03,990 --> 00:30:02,559
uh it also could have disappeared that

881
00:30:06,230 --> 00:30:04,000
was actually the prediction by our

882
00:30:08,230 --> 00:30:06,240
atmospheric scientists on our team that

883
00:30:10,389 --> 00:30:08,240
it would disappear within a day or two

884
00:30:12,149 --> 00:30:10,399
after seeing it two days ago or it could

885
00:30:14,230 --> 00:30:12,159
have just drifted along the south polar

886
00:30:17,190 --> 00:30:14,240
cap where these tor these storms tend to

887
00:30:19,350 --> 00:30:17,200
form uh so let's see what happened

888
00:30:22,149 --> 00:30:19,360

uh the mars reconnaissance orbiter has

889
00:30:23,909 --> 00:30:22,159
uh taken the global maps of mars for us

890
00:30:25,590 --> 00:30:23,919
using the mars color imager and my

891
00:30:28,230 --> 00:30:25,600
colleague bruce cantor at male and space

892
00:30:30,630 --> 00:30:28,240
science delivers those maps to us every

893
00:30:32,549 --> 00:30:30,640
morning at 7 30 or so

894
00:30:34,710 --> 00:30:32,559
and i'll show you on this earth map

895
00:30:37,590 --> 00:30:34,720
first just to orient you of how we view

896
00:30:39,669 --> 00:30:37,600
mars in the same map format again i'll

897
00:30:41,190 --> 00:30:39,679
point out north of australia there just

898
00:30:42,549 --> 00:30:41,200
about indonesia there's a little circle

899
00:30:45,110 --> 00:30:42,559
drawn on the map

900
00:30:47,430 --> 00:30:45,120
and that's where gale crater is in the

901
00:30:49,269 --> 00:30:47,440
same location on mars so now if you go

902
00:30:52,070 --> 00:30:49,279
to the next mars map

903
00:30:55,110 --> 00:30:52,080
this is the most current uh map of mars

904
00:30:57,830 --> 00:30:55,120
taken two days ago on august 2nd

905
00:31:00,710 --> 00:30:57,840
what has happened is the good scenario

906
00:31:02,630 --> 00:31:00,720
where that active dust storm which was

907
00:31:05,269 --> 00:31:02,640
boiling at the surface and very well

908
00:31:08,230 --> 00:31:05,279
defined two days ago has now evolved

909
00:31:10,630 --> 00:31:08,240
into a fairly harmless cloud of dust

910
00:31:13,190 --> 00:31:10,640
basically the the poof remnants of what

911
00:31:15,669 --> 00:31:13,200
was that dust storm and that dust cloud

912
00:31:17,430 --> 00:31:15,679
is is translating it it

913
00:31:19,430 --> 00:31:17,440

probably will not reach gale crater by

914
00:31:20,950 --> 00:31:19,440
the time we land and if it did

915
00:31:21,669 --> 00:31:20,960
the amount of dust in that cloud would

916
00:31:25,909 --> 00:31:21,679
not

917
00:31:28,389 --> 00:31:25,919
descendant landing in any meaningful way

918
00:31:30,870 --> 00:31:28,399
we continue to see the water ice clouds

919
00:31:33,750 --> 00:31:30,880
over mars this is a good thing we've

920
00:31:35,509 --> 00:31:33,760
predicted in years without

921
00:31:36,950 --> 00:31:35,519
bothersome dust storms

922
00:31:39,830 --> 00:31:36,960
there should be a lot of water ice

923
00:31:41,590 --> 00:31:39,840
clouds in the atmosphere because a cold

924
00:31:43,269 --> 00:31:41,600
atmosphere that's free of dust tends to

925
00:31:45,430 --> 00:31:43,279
have these water ice clouds at this time

926
00:31:47,509 --> 00:31:45,440
of year so the more we see these clouds

927
00:31:50,149 --> 00:31:47,519
the more we like it mars appears to be

928
00:31:52,230 --> 00:31:50,159
cooperating very nicely with us and we

929
00:31:53,590 --> 00:31:52,240
expect good weather for landing sunday

930
00:31:55,830 --> 00:31:53,600
night we're going to continue to look at

931
00:31:58,310 --> 00:31:55,840
this one more time tomorrow morning

932
00:32:00,149 --> 00:31:58,320
we'll get some more recent data

933
00:32:01,590 --> 00:32:00,159
and then i'll show you one final thing

934
00:32:03,830 --> 00:32:01,600
just to show you what could have

935
00:32:06,070 --> 00:32:03,840
happened uh we have

936
00:32:07,350 --> 00:32:06,080
uh we have three prior years of mars

937
00:32:10,710 --> 00:32:07,360
data from the mars reconnaissance

938
00:32:14,230 --> 00:32:10,720

orbiter and what this image shows is a

939
00:32:17,509 --> 00:32:14,240
map taken by the mars color imager to

940
00:32:19,350 --> 00:32:17,519
mars years ago this is from october 2008

941
00:32:21,750 --> 00:32:19,360
just at the same time we'd be landing

942
00:32:23,990 --> 00:32:21,760
the spacecraft on sunday night but two

943
00:32:27,190 --> 00:32:24,000
full mars years ago and you can see that

944
00:32:30,549 --> 00:32:27,200
there's remarkably few water ice clouds

945
00:32:33,750 --> 00:32:30,559
this particular year mars transitioned

946
00:32:36,070 --> 00:32:33,760
from its colder southern winter to its

947
00:32:38,630 --> 00:32:36,080
more dusty southern spring and summer

948
00:32:40,789 --> 00:32:38,640
earlier than we would have arrived

949
00:32:42,789 --> 00:32:40,799
you know if we had landed two years ago

950
00:32:44,630 --> 00:32:42,799
and the atmosphere warmed up the water

951
00:32:46,710 --> 00:32:44,640
ice clouds disappeared and the

952
00:32:48,630 --> 00:32:46,720
conditions in in this year were very

953
00:32:50,389 --> 00:32:48,640
ripe for a lot more dust activity in

954
00:32:51,669 --> 00:32:50,399
fact days before and after this

955
00:32:53,509 --> 00:32:51,679
particular image

956
00:32:54,789 --> 00:32:53,519
there was a lot more dust storms and

957
00:32:56,630 --> 00:32:54,799
that's actually what we took into

958
00:32:58,630 --> 00:32:56,640
account when we dr when we designed the

959
00:33:00,630 --> 00:32:58,640
entry descent and landing capabilities

960
00:33:02,149 --> 00:33:00,640
for this mission we had to be able to

961
00:33:03,750 --> 00:33:02,159
land in all the conditions we'd seen in

962
00:33:05,750 --> 00:33:03,760
previous years and and so that's what

963
00:33:07,590 --> 00:33:05,760

we've done but fortunately mars is

964
00:33:09,509 --> 00:33:07,600
playing nice and we're going to get good

965
00:33:11,830 --> 00:33:09,519
conditions for sunday

966
00:33:12,950 --> 00:33:11,840
i'll turn over back to you veronica

967
00:33:14,070 --> 00:33:12,960
all right thank you we're going to open

968
00:33:15,430 --> 00:33:14,080
it up to questions here in the

969
00:33:17,190 --> 00:33:15,440
auditorium we'll start with the news

970
00:33:19,430 --> 00:33:17,200
media and then we also have our nasa

971
00:33:20,870 --> 00:33:19,440
social participants here today with us

972
00:33:22,310 --> 00:33:20,880
and we'll take some questions from them

973
00:33:23,430 --> 00:33:22,320
as well so

974
00:33:24,789 --> 00:33:23,440
if you would raise your hand and we'll

975
00:33:26,549 --> 00:33:24,799
get the microphones to you and please

976
00:33:27,830 --> 00:33:26,559
give us your name and affiliation we'll

977
00:33:29,509 --> 00:33:27,840
start here first and then we'll go to

978
00:33:30,389 --> 00:33:29,519
the aisle next

979
00:33:32,870 --> 00:33:30,399
thank you

980
00:33:35,430 --> 00:33:32,880
uh olivier sangee and joyspace.com from

981
00:33:38,630 --> 00:33:35,440
france i'd like to know uh in the first

982
00:33:40,950 --> 00:33:38,640
data you will receive from curiosity

983
00:33:44,070 --> 00:33:40,960
will you have a sort of health check of

984
00:33:46,789 --> 00:33:44,080
the rover or just a beep

985
00:33:49,669 --> 00:33:46,799
uh so the depends on when we hear from

986
00:33:51,669 --> 00:33:49,679
it uh that under the best case scenario

987
00:33:53,590 --> 00:33:51,679
where we see the data

988
00:33:55,269 --> 00:33:53,600

from in each odyssey pass those two

989
00:33:57,350 --> 00:33:55,279
odyssey passes that'll be sunday night

990
00:33:59,750 --> 00:33:57,360
and early monday morning in both cases

991
00:34:01,590 --> 00:33:59,760
we'll get health data from the rover

992
00:34:03,269 --> 00:34:01,600
that tell us how it's doing you know we

993
00:34:05,190 --> 00:34:03,279
could have to wait until the next

994
00:34:08,069 --> 00:34:05,200
morning though depending on what

995
00:34:10,149 --> 00:34:08,079
happened uh and both on our side as well

996
00:34:11,909 --> 00:34:10,159
as odyssey odyssey you know clearly if

997
00:34:13,909 --> 00:34:11,919
it has something happened that that

998
00:34:15,349 --> 00:34:13,919
causes it to not be listening

999
00:34:17,750 --> 00:34:15,359
then we wouldn't be able to get that

1000
00:34:19,750 --> 00:34:17,760
data down so it's very much you know a

1001
00:34:22,149 --> 00:34:19,760
question of what happens

1002
00:34:25,109 --> 00:34:22,159
as in real time as as we go through the

1003
00:34:29,030 --> 00:34:27,270
okay emily loctawa from the planetary

1004
00:34:30,550 --> 00:34:29,040
society um i know that mars express is

1005
00:34:31,909 --> 00:34:30,560
going to be recording a signal i'm a

1006
00:34:33,270 --> 00:34:31,919
little there's been conflicting

1007
00:34:34,790 --> 00:34:33,280
information about whether there's

1008
00:34:36,629 --> 00:34:34,800
actually going to be any data contained

1009
00:34:38,389 --> 00:34:36,639
in that signal and so i'm wondering if

1010
00:34:40,389 --> 00:34:38,399
you can tell me about that and of what

1011
00:34:41,990 --> 00:34:40,399
use that data might be considering that

1012
00:34:43,669 --> 00:34:42,000
odyssey and mars reconnaissance orbit

1013
00:34:46,869 --> 00:34:43,679

are going to be so much closer and

1014
00:34:48,470 --> 00:34:46,879
receive better information sure the uh

1015
00:34:50,790 --> 00:34:48,480
the mars express spacecraft will be

1016
00:34:52,869 --> 00:34:50,800
recording essentially

1017
00:34:55,349 --> 00:34:52,879
information about the uhf signal it's

1018
00:34:58,310 --> 00:34:55,359
kind of like if it's there or not and

1019
00:35:01,109 --> 00:34:58,320
we'll be able to see the carrier signal

1020
00:35:03,510 --> 00:35:01,119
uh either be present or not in the in

1021
00:35:05,430 --> 00:35:03,520
the mars express data and so

1022
00:35:08,470 --> 00:35:05,440
you are right we are not going to get

1023
00:35:10,790 --> 00:35:08,480
actual digital data from that uh from

1024
00:35:13,670 --> 00:35:10,800
the mars express spacecraft we'll get a

1025
00:35:16,310 --> 00:35:13,680
spectrum a spectrograph if you will of

1026
00:35:18,790 --> 00:35:16,320
what the uh of what the radio heard

1027
00:35:20,710 --> 00:35:18,800
during entry descent and landing

1028
00:35:22,870 --> 00:35:20,720
it also doesn't occur in real time

1029
00:35:24,870 --> 00:35:22,880
either we get it it's like mro where

1030
00:35:25,990 --> 00:35:24,880
we'll get it recorded they will record

1031
00:35:28,150 --> 00:35:26,000
it and then they'll send it to us a

1032
00:35:29,349 --> 00:35:28,160
couple hours after landing

1033
00:35:31,349 --> 00:35:29,359
so

1034
00:35:35,030 --> 00:35:31,359
okay we're going here next followed by

1035
00:35:38,150 --> 00:35:35,040
leo over here and then on the other side

1036
00:35:40,710 --> 00:35:38,160
hi it's craig cavall with america space

1037
00:35:43,750 --> 00:35:40,720
and aerospace america

1038
00:35:47,589 --> 00:35:43,760

question about the dsn configuration

1039
00:35:49,190 --> 00:35:47,599
which dsn station will be

1040
00:35:50,790 --> 00:35:49,200
the prime one on

1041
00:35:51,990 --> 00:35:50,800
the landing night when you do go over

1042
00:35:54,390 --> 00:35:52,000
the hill

1043
00:35:56,150 --> 00:35:54,400
and discuss the san antanis further as

1044
00:35:57,510 --> 00:35:56,160
to which ones are going to be the

1045
00:36:01,270 --> 00:35:57,520
workhorse

1046
00:36:02,310 --> 00:36:01,280
so our canberra dsn stations will be

1047
00:36:03,990 --> 00:36:02,320
prime

1048
00:36:07,270 --> 00:36:04,000
for edl

1049
00:36:09,670 --> 00:36:07,280
uh we also have uh antennas at

1050
00:36:12,310 --> 00:36:09,680
um at parks and at new norsha in

1051
00:36:16,470 --> 00:36:12,320
australia which we'll be tracking in the

1052
00:36:21,430 --> 00:36:18,950
uh leo enright with irish television i

1053
00:36:22,710 --> 00:36:21,440
think probably for steve sal although

1054
00:36:23,990 --> 00:36:22,720
richard cook is pretty good at

1055
00:36:26,069 --> 00:36:24,000
reassuring us

1056
00:36:27,670 --> 00:36:26,079
over the years and i was looking at

1057
00:36:29,510 --> 00:36:27,680
things that might go wrong last night

1058
00:36:31,430 --> 00:36:29,520
and i thought i found something that i

1059
00:36:33,190 --> 00:36:31,440
hadn't noticed before

1060
00:36:34,710 --> 00:36:33,200
and that's a thing called the parachute

1061
00:36:35,510 --> 00:36:34,720
sabo

1062
00:36:37,670 --> 00:36:35,520
um

1063
00:36:39,430 --> 00:36:37,680

there was a description somewhere that i

1064
00:36:41,990 --> 00:36:39,440
read last night which described this

1065
00:36:44,710 --> 00:36:42,000
thing deploying the the parachute and

1066
00:36:46,790 --> 00:36:44,720
then re-contacting uh with the descent

1067
00:36:48,950 --> 00:36:46,800
stage to the point that it was quite

1068
00:36:52,230 --> 00:36:48,960
violent and might even damage one of the

1069
00:36:54,230 --> 00:36:52,240
uh the radio antennae was was i being

1070
00:36:56,470 --> 00:36:54,240
over allowed you might you might be

1071
00:36:59,349 --> 00:36:56,480
mixing a few things there we do have um

1072
00:37:01,510 --> 00:36:59,359
we do have a parachute closeout uh lid

1073
00:37:03,910 --> 00:37:01,520
which is base essentially the

1074
00:37:04,870 --> 00:37:03,920
the top of the uh

1075
00:37:06,390 --> 00:37:04,880
of the

1076
00:37:08,069 --> 00:37:06,400
i guess you can see it right here the

1077
00:37:09,910 --> 00:37:08,079
top of the the thing that closes out the

1078
00:37:11,910 --> 00:37:09,920
top of the parachute cone

1079
00:37:14,230 --> 00:37:11,920
that does get pushed off the top of the

1080
00:37:16,630 --> 00:37:14,240
spacecraft when the parachute deploys

1081
00:37:18,710 --> 00:37:16,640
but we've done lots of analysis on

1082
00:37:20,870 --> 00:37:18,720
exactly how that

1083
00:37:22,790 --> 00:37:20,880
how that lid behaves after deployment

1084
00:37:24,790 --> 00:37:22,800
and it'll it should drift off to the

1085
00:37:26,470 --> 00:37:24,800
side we don't expect any re-contact

1086
00:37:30,390 --> 00:37:26,480
there i'm not sure if that's what you're

1087
00:37:35,589 --> 00:37:33,430
good morning irene klotz with reuters um

1088
00:37:37,190 --> 00:37:35,599

i have a two questions the first is for

1089
00:37:38,710 --> 00:37:37,200
you doug the um

1090
00:37:40,390 --> 00:37:38,720
you all have done a really good job in

1091
00:37:42,390 --> 00:37:40,400
words and pictures of describing the

1092
00:37:44,390 --> 00:37:42,400
risk of the entry descent and landing

1093
00:37:46,390 --> 00:37:44,400
but you know nasa is an agency of

1094
00:37:47,349 --> 00:37:46,400
numbers and i was wondering if you did

1095
00:37:49,910 --> 00:37:47,359
have a

1096
00:37:52,870 --> 00:37:49,920
a probabilistic risk assessment of

1097
00:37:55,430 --> 00:37:52,880
landing successfully overall and if

1098
00:37:58,150 --> 00:37:55,440
there was any particular element in the

1099
00:38:00,230 --> 00:37:58,160
descent that from a numerical standpoint

1100
00:38:03,190 --> 00:38:00,240
from a risk assessment standpoint is

1101
00:38:05,349 --> 00:38:03,200
riskier than the other

1102
00:38:08,790 --> 00:38:05,359
i don't think there's a single number

1103
00:38:10,710 --> 00:38:08,800
that we can put on this um

1104
00:38:13,670 --> 00:38:10,720
we rate this there's there's everybody

1105
00:38:15,349 --> 00:38:13,680
gets to feed into the risk uh decision

1106
00:38:17,109 --> 00:38:15,359
process and the risk understanding

1107
00:38:20,069 --> 00:38:17,119
process and so i think we we've

1108
00:38:22,069 --> 00:38:20,079
collectively agreed that this is a as

1109
00:38:23,829 --> 00:38:22,079
low a risk proposition as possible but

1110
00:38:25,030 --> 00:38:23,839
it's almost impossible to put a single

1111
00:38:26,790 --> 00:38:25,040
number on

1112
00:38:28,710 --> 00:38:26,800
the probability of success from the top

1113
00:38:30,710 --> 00:38:28,720

of the atmosphere at the bottom so irene

1114
00:38:32,550 --> 00:38:30,720
there's not really a single number

1115
00:38:34,950 --> 00:38:32,560
um

1116
00:38:36,950 --> 00:38:34,960
there are analyses that are done and so

1117
00:38:38,550 --> 00:38:36,960
you can relate those to risk in every

1118
00:38:40,710 --> 00:38:38,560
event that occurs

1119
00:38:42,550 --> 00:38:40,720
but but i think that i mean it's just

1120
00:38:44,150 --> 00:38:42,560
such a complicated environment that i

1121
00:38:45,190 --> 00:38:44,160
don't think that any single number is

1122
00:38:46,710 --> 00:38:45,200
useful

1123
00:38:48,790 --> 00:38:46,720
uh tell you the truth richard do you

1124
00:38:52,150 --> 00:38:48,800
have a different view of that

1125
00:38:53,589 --> 00:38:52,160
um no i think we have we we do and steve

1126
00:38:56,069 --> 00:38:53,599
could certainly talk about a lot more we

1127
00:38:58,230 --> 00:38:56,079
do simulations monte carlo simulations

1128
00:39:00,230 --> 00:38:58,240
thousands of cases where we simulate all

1129
00:39:02,230 --> 00:39:00,240
the different parts of the particularly

1130
00:39:03,910 --> 00:39:02,240
the flight trajectory you know the

1131
00:39:05,990 --> 00:39:03,920
flight dynamics how the the how the

1132
00:39:08,310 --> 00:39:06,000
vehicle will you know use guided entry

1133
00:39:10,150 --> 00:39:08,320
algorithms and all that and we get

1134
00:39:12,870 --> 00:39:10,160
numbers from that but that only

1135
00:39:14,790 --> 00:39:12,880
represents some parts of what the

1136
00:39:16,870 --> 00:39:14,800
potential risk areas are it doesn't

1137
00:39:18,470 --> 00:39:16,880
include things like the you know will

1138
00:39:20,390 --> 00:39:18,480

the hardware do what it's supposed to do

1139
00:39:21,750 --> 00:39:20,400
it assumes that all the hardware

1140
00:39:23,589 --> 00:39:21,760
will do what it's supposed to do but you

1141
00:39:25,030 --> 00:39:23,599
don't but it's not and you get a number

1142
00:39:27,349 --> 00:39:25,040
that comes out of that but it doesn't

1143
00:39:28,390 --> 00:39:27,359
then roll in the what's the probability

1144
00:39:30,790 --> 00:39:28,400
that you might have a problem with the

1145
00:39:33,670 --> 00:39:30,800
parachute or whatever and so it's it's

1146
00:39:35,510 --> 00:39:33,680
hard to point out a single thing

1147
00:39:37,270 --> 00:39:35,520
that where it all comes together in one

1148
00:39:40,470 --> 00:39:37,280
integra as doug said in one integrated

1149
00:39:41,829 --> 00:39:40,480
number okay thanks and um uh for arthur

1150
00:39:44,150 --> 00:39:41,839
could you please explain a little bit

1151
00:39:45,109 --> 00:39:44,160
more about what that last um

1152
00:39:46,230 --> 00:39:45,119
planned

1153
00:39:48,550 --> 00:39:46,240
data

1154
00:39:50,790 --> 00:39:48,560
relay to msl

1155
00:39:53,270 --> 00:39:50,800
tomorrow night with the backup computer

1156
00:39:55,430 --> 00:39:53,280
exactly what that does and um for steve

1157
00:39:58,310 --> 00:39:55,440
if that you could give us the altitudes

1158
00:40:00,630 --> 00:39:58,320
of the mro and mars express at the time

1159
00:40:02,550 --> 00:40:00,640
of landing thanks

1160
00:40:04,630 --> 00:40:02,560
actually that that activity is not a

1161
00:40:05,990 --> 00:40:04,640
relay it's a it's a

1162
00:40:09,190 --> 00:40:06,000
it's a commanded activity on the

1163
00:40:11,829 --> 00:40:09,200

spacecraft it's it's it's our pla it's

1164
00:40:15,270 --> 00:40:11,839
been you know our baseline plan

1165
00:40:17,670 --> 00:40:15,280
to activate our backup computer with a

1166
00:40:19,030 --> 00:40:17,680
set of software that if in the event

1167
00:40:21,430 --> 00:40:19,040
very unlikely

1168
00:40:23,750 --> 00:40:21,440
uh the prime computer reset during edl

1169
00:40:26,309 --> 00:40:23,760
the backup computer would re would take

1170
00:40:27,750 --> 00:40:26,319
over and land the spacecraft so it's

1171
00:40:31,030 --> 00:40:27,760
always been in the plan to do it at this

1172
00:40:32,550 --> 00:40:31,040
time and and it's our last remaining

1173
00:40:34,230 --> 00:40:32,560
you know significant operational

1174
00:40:36,550 --> 00:40:34,240
activity

1175
00:40:38,230 --> 00:40:36,560
and as for the altitudes of mro and

1176
00:40:39,910 --> 00:40:38,240
odyssey i'd have to get back to you on

1177
00:40:42,230 --> 00:40:39,920
that i don't have those the exact

1178
00:40:43,190 --> 00:40:42,240
numbers of those

1179
00:40:44,390 --> 00:40:43,200
okay we're going to take a couple

1180
00:40:45,589 --> 00:40:44,400
questions from this side of the room and

1181
00:40:48,550 --> 00:40:45,599
then we're going back over there go

1182
00:40:50,069 --> 00:40:48,560
ahead um todd albers in florida today in

1183
00:40:52,710 --> 00:40:50,079
usa today

1184
00:40:54,950 --> 00:40:52,720
i was wondering who is responsible for

1185
00:40:56,390 --> 00:40:54,960
bringing the peanuts into the mission

1186
00:40:59,349 --> 00:40:56,400
control center

1187
00:41:01,589 --> 00:40:59,359
uh and i was also wondering if

1188
00:41:03,109 --> 00:41:01,599

one of you guys could give us an idea of

1189
00:41:05,030 --> 00:41:03,119
what your day is going to be like

1190
00:41:07,349 --> 00:41:05,040
tomorrow if you have any

1191
00:41:09,990 --> 00:41:07,359
landing day traditions or special

1192
00:41:11,670 --> 00:41:10,000
activities that happen you know during

1193
00:41:14,710 --> 00:41:11,680
the course of the day leading up to

1194
00:41:16,710 --> 00:41:14,720
coming into work thanks

1195
00:41:18,630 --> 00:41:16,720
well on the peanuts i think

1196
00:41:20,390 --> 00:41:18,640
it's everybody's responsibility to bring

1197
00:41:22,710 --> 00:41:20,400
peanuts on

1198
00:41:24,790 --> 00:41:22,720
because of that we have 50 50 jars so we

1199
00:41:26,470 --> 00:41:24,800
have plenty of peanuts

1200
00:41:29,990 --> 00:41:26,480
and and the mission manager usually

1201
00:41:30,870 --> 00:41:30,000
assures that that we don't run out

1202
00:41:32,790 --> 00:41:30,880
um

1203
00:41:35,910 --> 00:41:32,800
with respect to

1204
00:41:37,510 --> 00:41:35,920
traditions on on landing day i think

1205
00:41:40,069 --> 00:41:37,520
you know

1206
00:41:41,030 --> 00:41:40,079
it's traditional to to take a deep

1207
00:41:42,870 --> 00:41:41,040
breath

1208
00:41:45,910 --> 00:41:42,880
when we finally get there

1209
00:41:48,390 --> 00:41:45,920
and and and reflect a little bit on

1210
00:41:51,109 --> 00:41:48,400
on how far we've come and

1211
00:41:52,950 --> 00:41:51,119
and where we are so i think it's a it's

1212
00:41:55,030 --> 00:41:52,960
a it's

1213
00:41:57,349 --> 00:41:55,040

there's a moment of joy and a moment of

1214
00:41:59,270 --> 00:41:57,359
reflection as well

1215
00:42:00,950 --> 00:41:59,280
yeah my version of that would be as well

1216
00:42:02,550 --> 00:42:00,960
that it's that usually when you get to

1217
00:42:05,270 --> 00:42:02,560
the last day there's not

1218
00:42:06,870 --> 00:42:05,280
that much to do right other than to wait

1219
00:42:09,349 --> 00:42:06,880
and so usually you get a chance to go

1220
00:42:11,030 --> 00:42:09,359
have coffee with some people on the team

1221
00:42:13,270 --> 00:42:11,040
and just and to do exactly what arthur

1222
00:42:15,109 --> 00:42:13,280
said right which is to say okay

1223
00:42:17,510 --> 00:42:15,119
you know it's been a long trip here to

1224
00:42:20,069 --> 00:42:17,520
get here and and it's going to be in an

1225
00:42:22,550 --> 00:42:20,079
interesting next few hours and

1226
00:42:24,390 --> 00:42:22,560
time seems to have a weird

1227
00:42:26,950 --> 00:42:24,400
sort of rhythm in that last day right

1228
00:42:28,790 --> 00:42:26,960
where it goes real slow for a long time

1229
00:42:31,589 --> 00:42:28,800
and then in the last 15 minutes it goes

1230
00:42:33,349 --> 00:42:31,599
like that and and it really goes quickly

1231
00:42:36,309 --> 00:42:33,359
and and all of a sudden it's it's upon

1232
00:42:37,030 --> 00:42:36,319
us and so that's what will happen

1233
00:42:42,309 --> 00:42:37,040
uh

1234
00:42:44,150 --> 00:42:42,319
and national geographic

1235
00:42:46,710 --> 00:42:44,160
um

1236
00:42:47,589 --> 00:42:46,720
editors of course are very eager to know

1237
00:42:49,589 --> 00:42:47,599
when

1238
00:42:51,910 --> 00:42:49,599

might we know that the thing has safely

1239
00:42:52,710 --> 00:42:51,920
landed i know that there's the 14-minute

1240
00:42:57,270 --> 00:42:52,720
uh

1241
00:42:58,790 --> 00:42:57,280
what should we be telling our editors in

1242
00:42:59,510 --> 00:42:58,800
terms of the

1243
00:43:04,630 --> 00:42:59,520
uh

1244
00:43:05,990 --> 00:43:04,640
and and then i have a second question as

1245
00:43:11,750 --> 00:43:06,000
well

1246
00:43:14,309 --> 00:43:11,760
touchdowns at 10 10 31 10 32 there is

1247
00:43:16,710 --> 00:43:14,319
some variation on that due to

1248
00:43:18,950 --> 00:43:16,720
atmospheric changes that change how long

1249
00:43:20,309 --> 00:43:18,960
we might be on the parachute but uh

1250
00:43:22,390 --> 00:43:20,319
essentially we're

1251
00:43:24,790 --> 00:43:22,400
within plus or minus a minute or so of

1252
00:43:27,829 --> 00:43:24,800
1031 and

1253
00:43:29,349 --> 00:43:27,839
and if we have odyssey coverage uh

1254
00:43:31,910 --> 00:43:29,359
throughout if the odyssey coverage

1255
00:43:33,270 --> 00:43:31,920
remains all the way through uh we will

1256
00:43:35,510 --> 00:43:33,280
you know we'll be able to follow it

1257
00:43:37,430 --> 00:43:35,520
through touchdown at that time

1258
00:43:39,270 --> 00:43:37,440
as richard mentioned before there are

1259
00:43:41,270 --> 00:43:39,280
scenarios in which we you know for any

1260
00:43:43,589 --> 00:43:41,280
reason might not have the odyssey data

1261
00:43:45,670 --> 00:43:43,599
available in which case then uh richard

1262
00:43:47,910 --> 00:43:45,680
went through the several opportunities

1263
00:43:49,349 --> 00:43:47,920

after that that that we could know uh

1264
00:43:51,190 --> 00:43:49,359
when

1265
00:43:53,829 --> 00:43:51,200
what happened

1266
00:43:56,470 --> 00:43:53,839
10 45 or so and and how would we be

1267
00:43:58,630 --> 00:43:56,480
informed no the 10 30 the 10 31 number

1268
00:44:00,390 --> 00:43:58,640
is uh earth received time

1269
00:44:01,910 --> 00:44:00,400
so it will yeah that's

1270
00:44:03,109 --> 00:44:01,920
an interesting thing to point out is

1271
00:44:05,190 --> 00:44:03,119
that right we're actually watching the

1272
00:44:07,750 --> 00:44:05,200
whole thing on a 14 minute

1273
00:44:10,069 --> 00:44:07,760
light delay so it actually touched down

1274
00:44:13,349 --> 00:44:10,079
14 minutes ahead of that but

1275
00:44:15,990 --> 00:44:13,359
when we find out here is 10 31 and how

1276
00:44:18,550 --> 00:44:16,000
would we be informed you'll probably be

1277
00:44:20,390 --> 00:44:18,560
able to tell by a celebrating yeah

1278
00:44:24,390 --> 00:44:20,400
when everybody starts high fiving each

1279
00:44:29,510 --> 00:44:26,230
that we don't know then what we're going

1280
00:44:31,430 --> 00:44:29,520
to go into is we'll have a uh either a

1281
00:44:34,150 --> 00:44:31,440
press conference or a report out of the

1282
00:44:36,470 --> 00:44:34,160
msa you know as to as to what we think

1283
00:44:38,230 --> 00:44:36,480
we know or and and some member of the

1284
00:44:40,230 --> 00:44:38,240
team probably pete will give a briefing

1285
00:44:42,309 --> 00:44:40,240
as to what you know we think we know and

1286
00:44:45,109 --> 00:44:42,319
then we'll wait until that next odyssey

1287
00:44:46,710 --> 00:44:45,119
pass at 12 30 and we'll and we'll by

1288
00:44:48,309 --> 00:44:46,720

that point by the way have shifted to a

1289
00:44:49,510 --> 00:44:48,319
different mission support area so

1290
00:44:50,710 --> 00:44:49,520
different control room it'll be in a

1291
00:44:53,270 --> 00:44:50,720
different area

1292
00:44:55,750 --> 00:44:53,280
uh here at jpl but it's uh and and the

1293
00:44:56,950 --> 00:44:55,760
surface team will be there to to sort of

1294
00:44:58,870 --> 00:44:56,960
monitor whether or not we get a

1295
00:44:59,990 --> 00:44:58,880
communication signal uh but so that

1296
00:45:02,309 --> 00:45:00,000
would be the next time we would hear

1297
00:45:03,349 --> 00:45:02,319
from it is at that 12 30. okay and if

1298
00:45:06,470 --> 00:45:03,359
you would just one other question you

1299
00:45:08,950 --> 00:45:06,480
you had said that the uh the entry seems

1300
00:45:10,950 --> 00:45:08,960
to be picture perfect uh could you give

1301
00:45:13,750 --> 00:45:10,960
us just a little bit of comparison with

1302
00:45:14,550 --> 00:45:13,760
other mars entries does this one seem to

1303
00:45:15,349 --> 00:45:14,560
be

1304
00:45:16,790 --> 00:45:15,359
uh

1305
00:45:18,550 --> 00:45:16,800
more precise

1306
00:45:20,309 --> 00:45:18,560
about as precise as others have there

1307
00:45:21,990 --> 00:45:20,319
been others that were way off and then

1308
00:45:23,910 --> 00:45:22,000
suddenly you know were able to be

1309
00:45:24,710 --> 00:45:23,920
brought back in

1310
00:45:29,190 --> 00:45:24,720
i think

1311
00:45:32,150 --> 00:45:29,200
is i i haven't seen one better than this

1312
00:45:33,670 --> 00:45:32,160
one richard no i think it's exactly what

1313
00:45:35,829 --> 00:45:33,680

you said we the

1314
00:45:38,790 --> 00:45:35,839
this spacecraft design the way that this

1315
00:45:41,190 --> 00:45:38,800
vehicle is designed to fly during cruise

1316
00:45:42,950 --> 00:45:41,200
um is the same way as mer and and

1317
00:45:44,550 --> 00:45:42,960
pathfinder before it and because of that

1318
00:45:45,589 --> 00:45:44,560
they're very very

1319
00:45:47,750 --> 00:45:45,599
um

1320
00:45:49,670 --> 00:45:47,760
good as far as navigation that we we

1321
00:45:51,750 --> 00:45:49,680
have a very good idea where they are and

1322
00:45:53,349 --> 00:45:51,760
so on all those spacecraft you know they

1323
00:45:55,990 --> 00:45:53,359
did about the same as far as their

1324
00:45:58,069 --> 00:45:56,000
ability to to get it to the right spot

1325
00:45:59,589 --> 00:45:58,079
in this case we we have the challenge of

1326
00:46:01,990 --> 00:45:59,599
not only getting it to the right spot

1327
00:46:03,349 --> 00:46:02,000
but also telling it where it is which

1328
00:46:05,510 --> 00:46:03,359
actually makes it even more of a

1329
00:46:06,950 --> 00:46:05,520
challenge and so that part of it they're

1330
00:46:09,430 --> 00:46:06,960
actually doing even better than what

1331
00:46:10,790 --> 00:46:09,440
we've done in the past

1332
00:46:13,270 --> 00:46:10,800
all right we're going on the aisle here

1333
00:46:14,630 --> 00:46:13,280
go ahead hi i'm alan boyle with

1334
00:46:16,870 --> 00:46:14,640
nbc news

1335
00:46:18,150 --> 00:46:16,880
and i wondered if you could talk a

1336
00:46:21,030 --> 00:46:18,160
little bit about the scenario where

1337
00:46:23,430 --> 00:46:21,040
there are no signals received and how

1338
00:46:25,349 --> 00:46:23,440

long that search is going to continue i

1339
00:46:28,069 --> 00:46:25,359
think with the polar lander experience

1340
00:46:30,870 --> 00:46:28,079
that that went on for a while and then a

1341
00:46:34,390 --> 00:46:30,880
happier thought would be

1342
00:46:37,030 --> 00:46:34,400
having plans for mro to take a picture

1343
00:46:40,230 --> 00:46:37,040
of the landing site are there any plans

1344
00:46:41,910 --> 00:46:40,240
to do that at a particular time

1345
00:46:44,390 --> 00:46:41,920
yeah i guess i should talk about mpl

1346
00:46:46,390 --> 00:46:44,400
since i remember it better than most um

1347
00:46:48,470 --> 00:46:46,400
yeah the the uh

1348
00:46:50,390 --> 00:46:48,480
i think that our the way we sort of look

1349
00:46:53,030 --> 00:46:50,400
at it is that that there are

1350
00:46:56,309 --> 00:46:53,040
certainly very credible scenarios that

1351
00:46:59,750 --> 00:46:56,319
by which those odyssey and and mro

1352
00:47:02,390 --> 00:46:59,760
passes you know in the first 18 hours

1353
00:47:04,630 --> 00:47:02,400
might or might not happen um and and so

1354
00:47:06,870 --> 00:47:04,640
because of that uh we definitely think

1355
00:47:08,630 --> 00:47:06,880
that that that we can identify ways in

1356
00:47:10,790 --> 00:47:08,640
which we would have to wait until the

1357
00:47:13,990 --> 00:47:10,800
next morning for example to hear the mro

1358
00:47:15,750 --> 00:47:14,000
pass the x-band same thing that if we

1359
00:47:17,430 --> 00:47:15,760
for example had a problem with the radio

1360
00:47:19,109 --> 00:47:17,440
the uhf radio

1361
00:47:20,470 --> 00:47:19,119
on the rover it's not gonna we actually

1362
00:47:22,710 --> 00:47:20,480
have two of them but it's actually not

1363
00:47:24,790 --> 00:47:22,720

gonna switch over to the backup one

1364
00:47:26,790 --> 00:47:24,800
uh on its own that it that it would take

1365
00:47:28,390 --> 00:47:26,800
uh for several days it would take a

1366
00:47:31,750 --> 00:47:28,400
while to to

1367
00:47:33,510 --> 00:47:31,760
to to change over to the other radio so

1368
00:47:35,589 --> 00:47:33,520
because if for example we had a failure

1369
00:47:38,069 --> 00:47:35,599
of the radio we would certainly be not

1370
00:47:40,150 --> 00:47:38,079
hear anything from any of the orbiters

1371
00:47:41,510 --> 00:47:40,160
so because of that there's a scenario in

1372
00:47:43,589 --> 00:47:41,520
which you might say well we have to wait

1373
00:47:46,230 --> 00:47:43,599
all the way until 5 30 the next night to

1374
00:47:48,470 --> 00:47:46,240
hear from the the separate system that

1375
00:47:51,510 --> 00:47:48,480
does direct-to-earth communications

1376
00:47:53,270 --> 00:47:51,520
and so those are all very credible or

1377
00:47:55,270 --> 00:47:53,280
certainly credible situations where we'd

1378
00:47:57,990 --> 00:47:55,280
have to wait through that once we get

1379
00:47:59,829 --> 00:47:58,000
past that first

1380
00:48:01,670 --> 00:47:59,839
beep you know from the expand system if

1381
00:48:04,390 --> 00:48:01,680
we haven't heard from it in any of those

1382
00:48:06,150 --> 00:48:04,400
communication paths including that one

1383
00:48:08,309 --> 00:48:06,160
then i think that we would be definitely

1384
00:48:10,790 --> 00:48:08,319
in the not as you know in in the more

1385
00:48:12,950 --> 00:48:10,800
likely than not that we had a problem um

1386
00:48:15,829 --> 00:48:12,960
and so it would take 24 hours order of

1387
00:48:17,510 --> 00:48:15,839
24 hours to come to that that conclusion

1388
00:48:18,790 --> 00:48:17,520

there are certainly scenarios that we

1389
00:48:21,109 --> 00:48:18,800
can come up with and we got a lot of

1390
00:48:23,349 --> 00:48:21,119
smart engineers who can think of

1391
00:48:25,349 --> 00:48:23,359
you know off nominal paths that can get

1392
00:48:26,549 --> 00:48:25,359
us to it taking longer than that but

1393
00:48:28,549 --> 00:48:26,559
frankly they don't think they're very

1394
00:48:29,829 --> 00:48:28,559
likely and so i think once we get past

1395
00:48:31,990 --> 00:48:29,839
that first day

1396
00:48:35,109 --> 00:48:32,000
we're definitely in the low probability

1397
00:48:38,150 --> 00:48:36,870
emer so yeah you asked are we going to

1398
00:48:39,829 --> 00:48:38,160
try to take a picture when will we get

1399
00:48:42,630 --> 00:48:39,839
it back they are going to try to send it

1400
00:48:45,670 --> 00:48:42,640
back pretty quickly after uh after

1401
00:48:47,750 --> 00:48:45,680
landing um and so we hope that we will

1402
00:48:49,349 --> 00:48:47,760
get it by the time the next morning

1403
00:48:51,190 --> 00:48:49,359
comes around we'll have that picture but

1404
00:48:52,150 --> 00:48:51,200
it depends on you know if they got it

1405
00:48:53,670 --> 00:48:52,160
and how long it will take them to

1406
00:48:57,109 --> 00:48:53,680
process it but we're pushing to try to

1407
00:48:58,710 --> 00:48:57,119
get it that morning that next morning

1408
00:49:00,710 --> 00:48:58,720
uh that would be a picture of the

1409
00:49:02,950 --> 00:49:00,720
landing site post landing no that's a

1410
00:49:04,549 --> 00:49:02,960
picture as it's going down right um is

1411
00:49:06,470 --> 00:49:04,559
there anything then there is a plan to

1412
00:49:10,150 --> 00:49:06,480
actually take another picture

1413
00:49:13,190 --> 00:49:10,160

from uh mro of the vehicle the rover on

1414
00:49:15,349 --> 00:49:13,200
the surface the next day so like 24

1415
00:49:18,710 --> 00:49:15,359
hours later um there'll be an attempt to

1416
00:49:23,829 --> 00:49:19,670
okay we're going to come to the very

1417
00:49:28,069 --> 00:49:25,990
thanks uh jonathan amos bbc news just

1418
00:49:29,670 --> 00:49:28,079
remembering back to phoenix

1419
00:49:31,430 --> 00:49:29,680
i think there was one person in the uh

1420
00:49:33,030 --> 00:49:31,440
control room who was tasked with calling

1421
00:49:34,630 --> 00:49:33,040
out the milestones will we have

1422
00:49:37,270 --> 00:49:34,640
something similar this time so that we

1423
00:49:39,670 --> 00:49:37,280
we know we can follow it

1424
00:49:42,069 --> 00:49:39,680
yes we will i mean steve you can talk

1425
00:49:44,390 --> 00:49:42,079
about yeah we will have um uh we will

1426
00:49:46,630 --> 00:49:44,400
have someone in the in the control room

1427
00:49:49,349 --> 00:49:46,640
uh alan chen as his name and he'll be

1428
00:49:50,950 --> 00:49:49,359
narrating the uh the sequence as we go

1429
00:49:52,470 --> 00:49:50,960
as we go through it uh he'll be calling

1430
00:49:54,630 --> 00:49:52,480
out the the tones that we'll be

1431
00:49:57,109 --> 00:49:54,640
receiving from the from the spacecraft

1432
00:49:58,950 --> 00:49:57,119
as well as the uhf data

1433
00:50:00,710 --> 00:49:58,960
so he'll be the he'll be the voice of

1434
00:50:04,150 --> 00:50:00,720
mission control that you'll hear

1435
00:50:05,670 --> 00:50:04,160
uh in the uh in the feed

1436
00:50:08,230 --> 00:50:05,680
alan chen

1437
00:50:10,230 --> 00:50:08,240
chen yes

1438
00:50:11,750 --> 00:50:10,240

uh let's see here let's see where the

1439
00:50:13,910 --> 00:50:11,760
mics are okay let's go here and then

1440
00:50:15,750 --> 00:50:13,920
we'll go back on the aisles

1441
00:50:18,230 --> 00:50:15,760
jackie goddard for the times of london

1442
00:50:19,589 --> 00:50:18,240
first steve cell um i apologize if i

1443
00:50:20,790 --> 00:50:19,599
haven't grasped this but i just want to

1444
00:50:22,710 --> 00:50:20,800
be clear

1445
00:50:24,950 --> 00:50:22,720
this all-important beep that tells us

1446
00:50:26,950 --> 00:50:24,960
that it's down and landed

1447
00:50:28,710 --> 00:50:26,960
what form does that take what do you see

1448
00:50:30,630 --> 00:50:28,720
do you see a line of code you i think

1449
00:50:32,390 --> 00:50:30,640
you said you don't actually hear a ping

1450
00:50:35,430 --> 00:50:32,400
and it's not presumably just saying i'm

1451
00:50:36,710 --> 00:50:35,440
here what do you actually see that we're

1452
00:50:38,790 --> 00:50:36,720
wanting to

1453
00:50:40,710 --> 00:50:38,800
uh well you asked a very technical

1454
00:50:43,510 --> 00:50:40,720
question but basically it's a it's it's

1455
00:50:44,549 --> 00:50:43,520
a line of code we call them evrs

1456
00:50:46,549 --> 00:50:44,559
um

1457
00:50:47,910 --> 00:50:46,559
that that basically it's a it's just

1458
00:50:49,750 --> 00:50:47,920
almost you can almost think of it as a

1459
00:50:51,430 --> 00:50:49,760
text message uh kind of thing they're

1460
00:50:53,270 --> 00:50:51,440
very short and they have

1461
00:50:57,270 --> 00:50:53,280
a little bit of information so the the

1462
00:50:59,510 --> 00:50:57,280
touchdown uh evr uh will contain

1463
00:51:01,430 --> 00:50:59,520

uh everything from a couple of numbers

1464
00:51:04,470 --> 00:51:01,440
that tell us how how fast it touched

1465
00:51:05,829 --> 00:51:04,480
down uh to where it actually thinks it

1466
00:51:06,710 --> 00:51:05,839
it touched down

1467
00:51:08,870 --> 00:51:06,720
and

1468
00:51:10,470 --> 00:51:08,880
so we get uh we'll get that information

1469
00:51:13,030 --> 00:51:10,480
and it'll it'll appear on our screens

1470
00:51:14,470 --> 00:51:13,040
it'll also uh you'll see that indication

1471
00:51:17,510 --> 00:51:14,480
on the uh

1472
00:51:19,829 --> 00:51:17,520
on the displays that are available as

1473
00:51:21,829 --> 00:51:19,839
part of the feed

1474
00:51:25,750 --> 00:51:21,839
do you happen to know what edr stands

1475
00:51:29,190 --> 00:51:25,760
for oh event event record

1476
00:51:33,430 --> 00:51:30,630
sorry you can't you can't take the

1477
00:51:35,349 --> 00:51:33,440
engineer out of the

1478
00:51:40,630 --> 00:51:35,359
out of the acronym out of the engineer

1479
00:51:44,790 --> 00:51:42,470
yeah ev event

1480
00:51:46,230 --> 00:51:44,800
our record yeah

1481
00:51:47,589 --> 00:51:46,240
okay next

1482
00:51:50,710 --> 00:51:47,599
steve can i just follow up with scott

1483
00:51:52,790 --> 00:51:50,720
gold with the los angeles times so it's

1484
00:51:55,030 --> 00:51:52,800
essentially an either or situation as

1485
00:51:57,190 --> 00:51:55,040
far as when you'll receive confirmation

1486
00:51:58,470 --> 00:51:57,200
that you're on the ground uh

1487
00:52:00,309 --> 00:51:58,480
in other words if you have odyssey

1488
00:52:03,589 --> 00:52:00,319

coverage the first time you'll receive

1489
00:52:05,349 --> 00:52:03,599
that at roughly 10 31 and we'll see you

1490
00:52:07,430 --> 00:52:05,359
high-fiving each other and we'll know at

1491
00:52:09,190 --> 00:52:07,440
that point something if you don't have

1492
00:52:11,750 --> 00:52:09,200
odyssey coverage then it's neither or

1493
00:52:13,589 --> 00:52:11,760
scenario and you won't know anything

1494
00:52:15,589 --> 00:52:13,599
for sure for another two hours one way

1495
00:52:17,670 --> 00:52:15,599
or the other is that yeah that if we

1496
00:52:20,309 --> 00:52:17,680
don't have odyssey for whatever reason

1497
00:52:21,670 --> 00:52:20,319
at touchdown uh then yes it would be

1498
00:52:25,349 --> 00:52:21,680
several hours till we could know

1499
00:52:27,990 --> 00:52:25,359
anything additional okay and um what

1500
00:52:29,750 --> 00:52:28,000
might we be uh continuing the effort to

1501
00:52:32,790 --> 00:52:29,760
please our editors on a very tight

1502
00:52:35,990 --> 00:52:32,800
deadline what um

1503
00:52:37,190 --> 00:52:36,000
what might we listen for um from alan

1504
00:52:37,990 --> 00:52:37,200
chen

1505
00:52:39,030 --> 00:52:38,000
to

1506
00:52:40,870 --> 00:52:39,040
when he

1507
00:52:42,790 --> 00:52:40,880
offers confirmation to you that

1508
00:52:45,270 --> 00:52:42,800
something good has been received at 10

1509
00:52:48,150 --> 00:52:45,280
31 what should since we aren't in the

1510
00:52:49,670 --> 00:52:48,160
room what should we listen for

1511
00:52:51,910 --> 00:52:49,680
that would give us an indication that

1512
00:52:54,309 --> 00:52:51,920
things are progressing as expected they

1513
00:52:56,710 --> 00:52:54,319

will be playing the audio

1514
00:52:58,309 --> 00:52:56,720
allen's audio will be played over

1515
00:53:00,150 --> 00:52:58,319
you know whatever feeds that you happen

1516
00:53:02,790 --> 00:53:00,160
to be to be watching so you'll hear at

1517
00:53:04,710 --> 00:53:02,800
the same time the same time we hear it

1518
00:53:07,910 --> 00:53:04,720
and he'll say that

1519
00:53:09,510 --> 00:53:07,920
the rover's been or that we've received

1520
00:53:11,510 --> 00:53:09,520
the signal that the rover has touched

1521
00:53:12,829 --> 00:53:11,520
down on the surface

1522
00:53:14,390 --> 00:53:12,839
thank

1523
00:53:15,990 --> 00:53:14,400
you

1524
00:53:17,589 --> 00:53:16,000
okay let me go i'm trying to get people

1525
00:53:20,790 --> 00:53:17,599
who haven't had an opportunity yet so we

1526
00:53:23,270 --> 00:53:20,800
have one in the back there

1527
00:53:26,069 --> 00:53:23,280
hi steve gorman with reuters

1528
00:53:27,349 --> 00:53:26,079
my headers are also interested in

1529
00:53:29,750 --> 00:53:27,359
they want to know when this thing hits

1530
00:53:31,190 --> 00:53:29,760
the atmosphere at 13 000 miles an hour i

1531
00:53:32,069 --> 00:53:31,200
think you're going to be getting a beep

1532
00:53:40,790 --> 00:53:32,079
that

1533
00:53:42,470 --> 00:53:40,800
we'll get by tone only uh we'll get

1534
00:53:44,390 --> 00:53:42,480
cruise stage separation

1535
00:53:46,630 --> 00:53:44,400
let me give you some

1536
00:53:50,710 --> 00:53:46,640
some earth receive times on these so

1537
00:53:54,309 --> 00:53:53,030
10 14 you'll receive a cruise stage

1538
00:53:56,870 --> 00:53:54,319

separation

1539
00:54:00,150 --> 00:53:56,880
tone for that um we should get an entry

1540
00:54:02,870 --> 00:54:00,160
tone around 10 24 about 10 minutes later

1541
00:54:04,790 --> 00:54:02,880
uh and uh and then like i said there are

1542
00:54:08,069 --> 00:54:04,800
a couple more along the way that we used

1543
00:54:09,430 --> 00:54:08,079
to tell how how far along the spacecraft

1544
00:54:11,910 --> 00:54:09,440
has gotten during entry descent landing

1545
00:54:14,150 --> 00:54:11,920
so we send out some tones when we start

1546
00:54:16,950 --> 00:54:14,160
the turns the bank reversals and and

1547
00:54:18,870 --> 00:54:16,960
when we are uh deploying the parachute

1548
00:54:21,030 --> 00:54:18,880
and things like that uh but we like i

1549
00:54:23,270 --> 00:54:21,040
said in my uh at the beginning we

1550
00:54:24,470 --> 00:54:23,280
actually the earth will set from view of

1551
00:54:25,750 --> 00:54:24,480
the spacecraft

1552
00:54:29,750 --> 00:54:25,760
at some point while we're on the

1553
00:54:31,750 --> 00:54:29,760
parachute so at some point

1554
00:54:34,150 --> 00:54:31,760
about a minute or so after the parachute

1555
00:54:35,990 --> 00:54:34,160
deployed we we will no longer be able to

1556
00:54:37,910 --> 00:54:36,000
receive those tones and we'll be relying

1557
00:54:39,510 --> 00:54:37,920
on the data relay through odyssey for

1558
00:54:42,150 --> 00:54:39,520
the remainder of landing okay and can i

1559
00:54:43,750 --> 00:54:42,160
just so if if for some reason there's

1560
00:54:44,950 --> 00:54:43,760
not a tone when the thing

1561
00:54:46,789 --> 00:54:44,960
you don't get that you don't get the

1562
00:54:48,150 --> 00:54:46,799
odyssey odyssey is not available when

1563
00:54:49,430 --> 00:54:48,160

the thing actually lands and so you

1564
00:54:50,710 --> 00:54:49,440
don't know whether

1565
00:54:52,390 --> 00:54:50,720
it's landed or not

1566
00:54:55,109 --> 00:54:52,400
i i believe you guys said the next

1567
00:54:57,430 --> 00:54:55,119
opportunity for you to get some data

1568
00:54:59,510 --> 00:54:57,440
would be at 5 30 when there's an mro

1569
00:55:00,549 --> 00:54:59,520
overpass 5 30 a.m

1570
00:55:02,630 --> 00:55:00,559
our time

1571
00:55:03,829 --> 00:55:02,640
so yeah so let's go through it again

1572
00:55:05,270 --> 00:55:03,839
here that the

1573
00:55:07,109 --> 00:55:05,280
the

1574
00:55:09,589 --> 00:55:07,119
it's a little confusing because odyssey

1575
00:55:11,109 --> 00:55:09,599
is there and it's sending us data back

1576
00:55:12,710 --> 00:55:11,119
in the bent pipe mode where he was

1577
00:55:15,270 --> 00:55:12,720
saying you get the data essentially in

1578
00:55:17,270 --> 00:55:15,280
real time in addition to that though mro

1579
00:55:19,109 --> 00:55:17,280
is flying over at the same time and it's

1580
00:55:21,349 --> 00:55:19,119
recording all the data

1581
00:55:23,430 --> 00:55:21,359
and so during the middle of the night

1582
00:55:24,710 --> 00:55:23,440
that data you know after the odyssey

1583
00:55:26,069 --> 00:55:24,720
pass actually that data will get

1584
00:55:27,670 --> 00:55:26,079
transmitted back to the earth and we

1585
00:55:29,990 --> 00:55:27,680
will start processing it here on the

1586
00:55:31,990 --> 00:55:30,000
ground to see whether or not mro

1587
00:55:33,270 --> 00:55:32,000
recorded that the anything that odyssey

1588
00:55:36,470 --> 00:55:33,280

missed

1589
00:55:39,109 --> 00:55:36,480
certainly could have been recording it

1590
00:55:41,270 --> 00:55:39,119
we just won't know until that data comes

1591
00:55:42,309 --> 00:55:41,280
here to the ground and we process it and

1592
00:55:44,150 --> 00:55:42,319
we go through and do the signal

1593
00:55:45,750 --> 00:55:44,160
processing and how long will it take

1594
00:55:47,750 --> 00:55:45,760
before you receive the mro the

1595
00:55:49,589 --> 00:55:47,760
pre-recorded if you will

1596
00:55:52,470 --> 00:55:49,599
i think it gets to the ground in about

1597
00:55:53,750 --> 00:55:52,480
an hour and a half after after landing

1598
00:55:56,470 --> 00:55:53,760
and then it will take us somewhere

1599
00:55:57,750 --> 00:55:56,480
between an hour to an hour to determine

1600
00:55:59,750 --> 00:55:57,760
if there was a signal there and then

1601
00:56:01,430 --> 00:55:59,760
about four hours to get the telemetry

1602
00:56:03,670 --> 00:56:01,440
data out of it that tells us what the

1603
00:56:05,030 --> 00:56:03,680
spacecraft was doing during but honestly

1604
00:56:06,870 --> 00:56:05,040
wouldn't have another crack at it for

1605
00:56:09,670 --> 00:56:06,880
another 12 hours or something right so

1606
00:56:11,430 --> 00:56:09,680
so so it's sort of there's a an over an

1607
00:56:13,510 --> 00:56:11,440
interleaved set of things odyssey it's

1608
00:56:15,589 --> 00:56:13,520
doing its own thing odyssey has the pass

1609
00:56:20,150 --> 00:56:15,599
that's at 10 30 and then another one at

1610
00:56:22,630 --> 00:56:20,160
12 30 um at night right 30 am

1611
00:56:24,309 --> 00:56:22,640
12 30 am two hours after the after

1612
00:56:26,630 --> 00:56:24,319
landing landing that's right

1613
00:56:27,990 --> 00:56:26,640

so is it possible that odyssey

1614
00:56:30,069 --> 00:56:28,000
might pick up something on the on its

1615
00:56:31,589 --> 00:56:30,079
second pass that absolutely still

1616
00:56:33,190 --> 00:56:31,599
wouldn't have found out about because

1617
00:56:35,270 --> 00:56:33,200
mro still hasn't transferred it back

1618
00:56:37,109 --> 00:56:35,280
that's right exactly so there's various

1619
00:56:38,789 --> 00:56:37,119
scenarios by which we might find out

1620
00:56:40,630 --> 00:56:38,799
either from an odyssey overflight that

1621
00:56:42,710 --> 00:56:40,640
occurs two hours later or when we go

1622
00:56:44,630 --> 00:56:42,720
back and process the mro data or even

1623
00:56:46,230 --> 00:56:44,640
when we look at the mex the mars express

1624
00:56:47,910 --> 00:56:46,240
data which kind of shows up in that time

1625
00:56:50,069 --> 00:56:47,920
frame as well so all throughout that

1626
00:56:52,069 --> 00:56:50,079
night we might we're getting various

1627
00:56:53,910 --> 00:56:52,079
pieces of information and in all of

1628
00:56:56,309 --> 00:56:53,920
these cases each of the spacecraft is

1629
00:56:57,990 --> 00:56:56,319
re-transmitting it a couple times

1630
00:56:59,990 --> 00:56:58,000
because we could also lose the data you

1631
00:57:02,230 --> 00:57:00,000
know when it as it's transmitting it i

1632
00:57:04,069 --> 00:57:02,240
mean the orbiters sometimes have data

1633
00:57:05,670 --> 00:57:04,079
dropouts where the data doesn't all come

1634
00:57:07,349 --> 00:57:05,680
down and so they're going to send it

1635
00:57:09,190 --> 00:57:07,359
multiple times just to make sure we got

1636
00:57:10,789 --> 00:57:09,200
all the information here on the earth

1637
00:57:13,030 --> 00:57:10,799
the next time the rover will try to

1638
00:57:15,750 --> 00:57:13,040

communicate to us after that 12 30

1639
00:57:18,789 --> 00:57:15,760
opportunity is the next morning at like

1640
00:57:20,309 --> 00:57:18,799
11 30 a.m here

1641
00:57:22,630 --> 00:57:20,319
where it will again try to communicate

1642
00:57:25,270 --> 00:57:22,640
through mro and odyssey

1643
00:57:27,990 --> 00:57:25,280
as at in a a new time that it will try

1644
00:57:30,069 --> 00:57:28,000
to communicate through the vent pipe

1645
00:57:32,710 --> 00:57:30,079
or is that director in the case of of

1646
00:57:34,630 --> 00:57:32,720
odyssey yes in the case of mro no it

1647
00:57:35,910 --> 00:57:34,640
will record it and send it back i mean

1648
00:57:37,910 --> 00:57:35,920
the rover you said we'll next try to

1649
00:57:39,510 --> 00:57:37,920
communicate directly to earth no to the

1650
00:57:40,630 --> 00:57:39,520
orbiters to the orbit

1651
00:57:42,630 --> 00:57:40,640
the first time that it will try to

1652
00:57:44,069 --> 00:57:42,640
communicate directly to the earth will

1653
00:57:46,870 --> 00:57:44,079
be at 5 30

1654
00:57:49,030 --> 00:57:46,880
on monday afternoon so almost 18 hours

1655
00:57:51,829 --> 00:57:49,040
or whatever after after landing

1656
00:57:55,430 --> 00:57:53,670
well let me just clarify one thing we'll

1657
00:57:57,190 --> 00:57:55,440
be doing commentary during landing of

1658
00:57:58,950 --> 00:57:57,200
course and right after landing we will

1659
00:58:00,309 --> 00:57:58,960
switch to the surf and a surface mission

1660
00:58:02,309 --> 00:58:00,319
support area

1661
00:58:04,789 --> 00:58:02,319
for that 12 30

1662
00:58:06,549 --> 00:58:04,799
odyssey pass so you will be able to see

1663
00:58:07,829 --> 00:58:06,559

both that night the um the initial one

1664
00:58:09,190 --> 00:58:07,839
at landing and then the one a couple

1665
00:58:10,870 --> 00:58:09,200
hours later

1666
00:58:12,470 --> 00:58:10,880
and let me see if there's someone else

1667
00:58:14,470 --> 00:58:12,480
in the room who has not been able to ask

1668
00:58:15,990 --> 00:58:14,480
a question yet and then we will invite

1669
00:58:17,670 --> 00:58:16,000
nasa's social participants if you'd like

1670
00:58:20,549 --> 00:58:17,680
to ask a question so we'll go right here

1671
00:58:24,069 --> 00:58:21,910
hi this is this is mike wahl from

1672
00:58:25,990 --> 00:58:24,079
space.com and i wanted to ask a question

1673
00:58:33,510 --> 00:58:26,000
actually of the guy who just walked off

1674
00:58:37,829 --> 00:58:35,829
um yeah this is about

1675
00:58:39,349 --> 00:58:37,839
dan mars weather dust storms and such i

1676
00:58:40,789 --> 00:58:39,359
mean you're saying that

1677
00:58:42,789 --> 00:58:40,799
that it's never going to be a serious

1678
00:58:45,670 --> 00:58:42,799
concern because you've sort of designed

1679
00:58:47,589 --> 00:58:45,680
this craft to

1680
00:58:48,950 --> 00:58:47,599
yeah sort of weather whatever dust storm

1681
00:58:50,950 --> 00:58:48,960
that could be thrown at it i mean have

1682
00:58:53,510 --> 00:58:50,960
you ever seen a dust storm on mars that

1683
00:58:55,990 --> 00:58:53,520
is strong enough big enough conceivably

1684
00:58:57,430 --> 00:58:56,000
to actually imperil the spacecraft or is

1685
00:58:58,710 --> 00:58:57,440
it always just kind of an annoyance

1686
00:58:59,990 --> 00:58:58,720
where it might push it off course a

1687
00:59:02,150 --> 00:59:00,000
little bit

1688
00:59:04,549 --> 00:59:02,160

yeah that's the analysis we did with the

1689
00:59:06,309 --> 00:59:04,559
past years of data

1690
00:59:08,549 --> 00:59:06,319
the the guy i mentioned bruce cantor at

1691
00:59:10,309 --> 00:59:08,559
male in space science is

1692
00:59:12,950 --> 00:59:10,319
has spent years counting every dust

1693
00:59:14,789 --> 00:59:12,960
storm learning how they behave

1694
00:59:15,829 --> 00:59:14,799
figuring out how they evolve over time

1695
00:59:19,030 --> 00:59:15,839
how

1696
00:59:19,750 --> 00:59:19,040
dust storms

1697
00:59:22,150 --> 00:59:19,760
and

1698
00:59:23,750 --> 00:59:22,160
at this season we realized that if we

1699
00:59:25,510 --> 00:59:23,760
were to land you know right down the

1700
00:59:29,030 --> 00:59:25,520
middle of a dust storm

1701
00:59:30,230 --> 00:59:29,040
we could actually get winds that could

1702
00:59:32,390 --> 00:59:30,240
you know fairly

1703
00:59:34,230 --> 00:59:32,400
severely affect the ability to time some

1704
00:59:36,390 --> 00:59:34,240
of the events when some of these

1705
00:59:38,230 --> 00:59:36,400
critical events happen

1706
00:59:39,670 --> 00:59:38,240
because the the spacecraft is sensing

1707
00:59:41,109 --> 00:59:39,680
the conditions

1708
00:59:43,589 --> 00:59:41,119
in real time

1709
00:59:46,390 --> 00:59:43,599
so there could be um

1710
00:59:48,390 --> 00:59:46,400
there could be certain cases where a

1711
00:59:50,870 --> 00:59:48,400
very violent active dust storm right at

1712
00:59:53,030 --> 00:59:50,880
gale could cause a problem but that's

1713
00:59:53,750 --> 00:59:53,040

not typical of the season at all in fact

1714
00:59:55,910 --> 00:59:53,760
we

1715
00:59:57,190 --> 00:59:55,920
the risk of an active dust storm right

1716
00:59:59,829 --> 00:59:57,200
over gale

1717
01:00:01,750 --> 00:59:59,839
we realized was extremely small it's

1718
01:00:02,789 --> 01:00:01,760
never actually been seen

1719
01:00:03,829 --> 01:00:02,799
so

1720
01:00:05,750 --> 01:00:03,839
instead

1721
01:00:07,910 --> 01:00:05,760
we looked at what actually could happen

1722
01:00:09,990 --> 01:00:07,920
and the full range of events that could

1723
01:00:12,230 --> 01:00:10,000
happen mostly related to dust storms

1724
01:00:14,549 --> 01:00:12,240
along that south polar cap that pushed

1725
01:00:16,789 --> 01:00:14,559
dust towards gail and designed the

1726
01:00:19,349 --> 01:00:16,799
spacecraft to handle the dusty years the

1727
01:00:21,349 --> 01:00:19,359
clear years all those conditions

1728
01:00:22,789 --> 01:00:21,359
so this is a very tolerant spacecraft

1729
01:00:25,510 --> 01:00:22,799
it's almost putting us out of business

1730
01:00:27,030 --> 01:00:25,520
in terms of predicting the weather

1731
01:00:29,670 --> 01:00:27,040
the previous spacecraft were much more

1732
01:00:31,589 --> 01:00:29,680
sensitive to the atmospheric conditions

1733
01:00:32,789 --> 01:00:31,599
partly also because the spacecraft is so

1734
01:00:34,230 --> 01:00:32,799
big

1735
01:00:36,789 --> 01:00:34,240
the descent stage

1736
01:00:38,230 --> 01:00:36,799
and rover that flies the spacecraft down

1737
01:00:40,390 --> 01:00:38,240
are very tolerant to winds at the

1738
01:00:42,950 --> 01:00:40,400

surface where previous landers were

1739
01:00:44,470 --> 01:00:42,960
affected by those surface winds so

1740
01:00:46,069 --> 01:00:44,480
we haven't really had to consider winds

1741
01:00:47,990 --> 01:00:46,079
of the surface much at all we really

1742
01:00:49,670 --> 01:00:48,000
just care higher up in the atmosphere

1743
01:00:51,109 --> 01:00:49,680
where we're doing the guided entry and

1744
01:00:53,030 --> 01:00:51,119
where we're timing some of those events

1745
01:00:57,030 --> 01:00:53,040
like the heat shield coming off and and

1746
01:00:59,589 --> 01:00:57,040
initiating the powered descent

1747
01:01:01,670 --> 01:00:59,599
okay here on the aisle thanks henry

1748
01:01:03,430 --> 01:01:01,680
bortman with astrobiology magazine steve

1749
01:01:04,549 --> 01:01:03,440
you described during the descent stage

1750
01:01:05,270 --> 01:01:04,559
of

1751
01:01:07,750 --> 01:01:05,280
the

1752
01:01:11,349 --> 01:01:07,760
rocket controlled uh back and forth

1753
01:01:12,950 --> 01:01:11,359
motion of the spacecraft it and

1754
01:01:16,069 --> 01:01:12,960
correct me if i'm wrong but that's not

1755
01:01:18,549 --> 01:01:16,079
only to more accurately position

1756
01:01:20,789 --> 01:01:18,559
the craft for landing but it's also kind

1757
01:01:23,030 --> 01:01:20,799
of like doing switchbacks and

1758
01:01:25,190 --> 01:01:23,040
controlling

1759
01:01:28,470 --> 01:01:25,200
or or targeting a specific rate of

1760
01:01:29,910 --> 01:01:28,480
descent sure that so when we first enter

1761
01:01:32,230 --> 01:01:29,920
the atmosphere the first thing we do is

1762
01:01:33,349 --> 01:01:32,240
we enter what we call range control uh

1763
01:01:35,750 --> 01:01:33,359

and if you

1764
01:01:37,670 --> 01:01:35,760
demonstrate briefly here instead of

1765
01:01:40,150 --> 01:01:37,680
flying sort of straight into the

1766
01:01:42,230 --> 01:01:40,160
atmosphere where the where the nose of

1767
01:01:44,150 --> 01:01:42,240
the of the spacecraft is kind of pointed

1768
01:01:46,150 --> 01:01:44,160
straight ahead we actually fly in with a

1769
01:01:48,470 --> 01:01:46,160
little bit of a tilt and that gives us

1770
01:01:50,710 --> 01:01:48,480
some that gives us a lift or we call it

1771
01:01:52,710 --> 01:01:50,720
a lift vector which which allows us to

1772
01:01:53,670 --> 01:01:52,720
as we turn the spacecraft it will steer

1773
01:01:56,309 --> 01:01:53,680
it

1774
01:01:58,069 --> 01:01:56,319
back and forth across

1775
01:01:59,670 --> 01:01:58,079
it will it will steer it in through s

1776
01:02:01,750 --> 01:01:59,680
turns now the only reason we do the

1777
01:02:03,670 --> 01:02:01,760
turns is because if we want to fly

1778
01:02:05,750 --> 01:02:03,680
higher in the atmosphere where it's less

1779
01:02:08,710 --> 01:02:05,760
dense so we slow down

1780
01:02:10,309 --> 01:02:08,720
slower we actually turn the lift up we

1781
01:02:12,069 --> 01:02:10,319
that'll make the spacecraft fly a little

1782
01:02:13,910 --> 01:02:12,079
bit higher where the air is thinner and

1783
01:02:16,390 --> 01:02:13,920
we won't slow down as quickly

1784
01:02:17,829 --> 01:02:16,400
and if we need to dip down into the

1785
01:02:19,270 --> 01:02:17,839
denser atmosphere we turn the lift to

1786
01:02:21,190 --> 01:02:19,280
the side the spacecraft will sink a

1787
01:02:22,950 --> 01:02:21,200
little bit and the fact that we have to

1788
01:02:25,190 --> 01:02:22,960

turn the lift to the side in order to

1789
01:02:27,270 --> 01:02:25,200
sink the spacecraft causes us to do

1790
01:02:28,870 --> 01:02:27,280
these turns it and so we don't want to

1791
01:02:30,789 --> 01:02:28,880
get too far off course

1792
01:02:32,630 --> 01:02:30,799
as we're as we start to drift off to one

1793
01:02:34,069 --> 01:02:32,640
side we'll flip over and fly the other

1794
01:02:35,349 --> 01:02:34,079
way and we just keep sort of flying back

1795
01:02:36,789 --> 01:02:35,359
and forth all the while what we're

1796
01:02:39,670 --> 01:02:36,799
actually controlling

1797
01:02:41,990 --> 01:02:39,680
is how high or low we're flying through

1798
01:02:45,029 --> 01:02:42,000
the atmosphere to stay in a certain

1799
01:02:47,589 --> 01:02:45,039
range of of deceleration to bring us to

1800
01:02:49,029 --> 01:02:47,599
a stop over the target

1801
01:02:50,309 --> 01:02:49,039
i hope all right i'm going to see if

1802
01:02:52,069 --> 01:02:50,319
there's any uh

1803
01:02:53,510 --> 01:02:52,079
anyone from the nasa social event that

1804
01:02:54,710 --> 01:02:53,520
would like to ask a question we have one

1805
01:02:56,230 --> 01:02:54,720
here on the

1806
01:02:57,750 --> 01:02:56,240
in the front

1807
01:02:59,910 --> 01:02:57,760
we can get a microphone to or raise your

1808
01:03:01,029 --> 01:02:59,920
hand a little higher so they can see you

1809
01:03:03,510 --> 01:03:01,039
and then give us your name and where

1810
01:03:05,109 --> 01:03:03,520
you're from hi i'm rachel sanders i

1811
01:03:09,029 --> 01:03:05,119
guess i'm from the internet

1812
01:03:13,670 --> 01:03:11,670
um so you were talking about the landing

1813
01:03:14,870 --> 01:03:13,680

of the of this and so can you talk a

1814
01:03:17,109 --> 01:03:14,880
little bit about

1815
01:03:19,109 --> 01:03:17,119
how it um

1816
01:03:20,789 --> 01:03:19,119
tries to land in that ellipse uh where

1817
01:03:22,710 --> 01:03:20,799
how it does any hazard avoidance you

1818
01:03:23,589 --> 01:03:22,720
know where it decides to land and things

1819
01:03:25,190 --> 01:03:23,599
like that

1820
01:03:27,750 --> 01:03:25,200
thank you

1821
01:03:30,789 --> 01:03:27,760
sure basically uh we

1822
01:03:32,710 --> 01:03:30,799
load on board the spacecraft a target

1823
01:03:34,870 --> 01:03:32,720
so a latitude longitude on the planet

1824
01:03:37,349 --> 01:03:34,880
that we're trying to fly to and right

1825
01:03:40,069 --> 01:03:37,359
before entry descent and landing starts

1826
01:03:41,349 --> 01:03:40,079
you may have heard us talk about entry

1827
01:03:43,270 --> 01:03:41,359
parameter updates that we do

1828
01:03:45,190 --> 01:03:43,280
periodically and all we're doing there

1829
01:03:47,029 --> 01:03:45,200
is we're telling the spacecraft when you

1830
01:03:48,789 --> 01:03:47,039
start entry descent and landing you are

1831
01:03:51,349 --> 01:03:48,799
here so you can imagine you're given a

1832
01:03:53,670 --> 01:03:51,359
map and we're putting the dot on the map

1833
01:03:56,230 --> 01:03:53,680
of where the spacecraft is starting

1834
01:03:57,589 --> 01:03:56,240
and so on board it's constantly sensing

1835
01:03:59,670 --> 01:03:57,599
how much it's turning and how much it's

1836
01:04:01,990 --> 01:03:59,680
slowing down and so it's sort of

1837
01:04:04,309 --> 01:04:02,000
calculating where it is on that map and

1838
01:04:07,270 --> 01:04:04,319

trying to fly itself to the to the

1839
01:04:09,910 --> 01:04:07,280
target that we have pre-loaded now uh we

1840
01:04:13,109 --> 01:04:09,920
we don't do any hazard uh detection and

1841
01:04:15,190 --> 01:04:13,119
avoidance we sort of did that manually

1842
01:04:18,150 --> 01:04:15,200
ourselves by placing the ellipse in an

1843
01:04:20,069 --> 01:04:18,160
area where uh there the number of rocks

1844
01:04:21,589 --> 01:04:20,079
or slopes that we could that would

1845
01:04:23,190 --> 01:04:21,599
exceed the capability of our touchdown

1846
01:04:25,190 --> 01:04:23,200
system where that would where there was

1847
01:04:27,270 --> 01:04:25,200
low probability of encountering stuff

1848
01:04:29,190 --> 01:04:27,280
like that so we find a nice safe place

1849
01:04:30,150 --> 01:04:29,200
to put the the ellipse down once we put

1850
01:04:32,710 --> 01:04:30,160
it down

1851
01:04:34,870 --> 01:04:32,720
we pick the x marks the spot and we tell

1852
01:04:36,230 --> 01:04:34,880
the spacecraft fly to that x

1853
01:04:38,470 --> 01:04:36,240
all right we have time for one more

1854
01:04:40,309 --> 01:04:38,480
question and um

1855
01:04:41,589 --> 01:04:40,319
let me see if there's uh

1856
01:04:43,270 --> 01:04:41,599
you have not asked a question yet

1857
01:04:45,029 --> 01:04:43,280
correct okay let's take you and then and

1858
01:04:46,549 --> 01:04:45,039
then others um you can come up after the

1859
01:04:48,390 --> 01:04:46,559
press conference and ask more questions

1860
01:04:50,390 --> 01:04:48,400
brad snowder western washington

1861
01:04:53,029 --> 01:04:50,400
university planetarium in bellingham

1862
01:04:55,750 --> 01:04:53,039
washington do you have an idea in mind

1863
01:04:58,230 --> 01:04:55,760

uh for naming the rocks in the landing

1864
01:05:02,950 --> 01:05:01,029
yeah it's a good question

1865
01:05:04,230 --> 01:05:02,960
i'll start just with uh some of the

1866
01:05:07,109 --> 01:05:04,240
bigger features

1867
01:05:08,470 --> 01:05:07,119
gail crader was named by the people who

1868
01:05:09,510 --> 01:05:08,480
name these things on planet the

1869
01:05:12,150 --> 01:05:09,520
international

1870
01:05:13,910 --> 01:05:12,160
astronomical union and the uh other

1871
01:05:15,430 --> 01:05:13,920
mappers

1872
01:05:17,990 --> 01:05:15,440
he's an australian

1873
01:05:19,910 --> 01:05:18,000
astronomer who lived a long time ago we

1874
01:05:20,789 --> 01:05:19,920
didn't come up with that name

1875
01:05:23,510 --> 01:05:20,799
also

1876
01:05:26,230 --> 01:05:23,520
the that same body as named the major

1877
01:05:28,230 --> 01:05:26,240
features on mars for the historical what

1878
01:05:29,829 --> 01:05:28,240
they call albedo features going all the

1879
01:05:32,230 --> 01:05:29,839
way back to telescopic days they're

1880
01:05:34,789 --> 01:05:32,240
bright and dark patches on mars

1881
01:05:37,029 --> 01:05:34,799
and the closest one of those features to

1882
01:05:39,589 --> 01:05:37,039
gale craters called aeolus

1883
01:05:41,829 --> 01:05:39,599
and so the official names really uh

1884
01:05:44,309 --> 01:05:41,839
of the mound inside of gale crater where

1885
01:05:47,589 --> 01:05:44,319
we're going is called aeolus mons mount

1886
01:05:49,190 --> 01:05:47,599
aiolis really in latin i guess

1887
01:05:51,430 --> 01:05:49,200
the team has also

1888
01:05:54,230 --> 01:05:51,440

informally named that feature inside of

1889
01:05:56,630 --> 01:05:54,240
gale crater mount sharp in honor of

1890
01:05:58,870 --> 01:05:56,640
robert sharp who's a planetary who was a

1891
01:06:00,150 --> 01:05:58,880
planetary geologist at caltech

1892
01:06:02,230 --> 01:06:00,160
and really one of the founders of

1893
01:06:05,190 --> 01:06:02,240
planetary geology who brought earth

1894
01:06:06,390 --> 01:06:05,200
geology to mars in the early days of the

1895
01:06:09,990 --> 01:06:06,400
mariner

1896
01:06:12,390 --> 01:06:10,000
once we get on the surface we'll start

1897
01:06:13,910 --> 01:06:12,400
naming those smaller features as well

1898
01:06:15,829 --> 01:06:13,920
and the team is still working through

1899
01:06:17,990 --> 01:06:15,839
exactly how that will happen what they

1900
01:06:20,150 --> 01:06:18,000
have done as john grossinger told you a

1901
01:06:21,750 --> 01:06:20,160
few days ago is divided the entire area

1902
01:06:23,670 --> 01:06:21,760
where we're going to be exploring

1903
01:06:25,910 --> 01:06:23,680
up into these quads

1904
01:06:27,829 --> 01:06:25,920
these grit this grid pattern and each

1905
01:06:29,510 --> 01:06:27,839
scientist on the team who has been

1906
01:06:31,029 --> 01:06:29,520
looking at that grid will come up with

1907
01:06:32,390 --> 01:06:31,039
the naming scheme for features in that

1908
01:06:33,430 --> 01:06:32,400
area

1909
01:06:35,589 --> 01:06:33,440
and

1910
01:06:36,789 --> 01:06:35,599
that's sort of how we'll go about it i i

1911
01:06:38,789 --> 01:06:36,799
don't have any of those for you right

1912
01:06:41,190 --> 01:06:38,799
now but that's something that we'll

1913
01:06:43,270 --> 01:06:41,200

we'll be working on

1914
01:06:45,270 --> 01:06:43,280
okay i'm told we have time for one quick

1915
01:06:46,950 --> 01:06:45,280
question and answer so

1916
01:06:49,589 --> 01:06:46,960
i'm gonna go with the hand i saw first

1917
01:06:53,190 --> 01:06:49,599
and that was over here on this side

1918
01:06:54,309 --> 01:06:53,200
all the way up on the aisle thanks

1919
01:06:57,029 --> 01:06:54,319
thanks

1920
01:07:00,069 --> 01:06:57,039
irene klotz with reuters uh um ashwin

1921
01:07:01,589 --> 01:07:00,079
could you just describe the other um uh

1922
01:07:03,190 --> 01:07:01,599
i guess the scene at mars is you said

1923
01:07:04,870 --> 01:07:03,200
it's going to be 3 30 in the afternoon

1924
01:07:06,549 --> 01:07:04,880
there what's the temperature what do you

1925
01:07:09,430 --> 01:07:06,559
expect the winds to be what color are

1926
01:07:11,109 --> 01:07:09,440
those ice clouds i think sure

1927
01:07:12,470 --> 01:07:11,119
yeah you know based on our orbital

1928
01:07:13,990 --> 01:07:12,480
reconnaissance we believe that there'll

1929
01:07:19,589 --> 01:07:14,000
be a

1930
01:07:21,750 --> 01:07:19,599
you know late afternoon day on mars when

1931
01:07:22,870 --> 01:07:21,760
we land we won't see this right away

1932
01:07:24,309 --> 01:07:22,880
with those black and white pictures

1933
01:07:26,630 --> 01:07:24,319
which are more pointed to the ground but

1934
01:07:29,589 --> 01:07:26,640
in the next few days we'll be inside

1935
01:07:32,069 --> 01:07:29,599
this deep topographic hole on mars you

1936
01:07:34,710 --> 01:07:32,079
know gale crater is a is a hole punched

1937
01:07:37,270 --> 01:07:34,720
into the uh the surface of mars

1938
01:07:39,029 --> 01:07:37,280

and as such there may be these water ice

1939
01:07:40,630 --> 01:07:39,039
clouds that that

1940
01:07:42,230 --> 01:07:40,640
haze overhead

1941
01:07:43,670 --> 01:07:42,240
the sun will set you know on the rim of

1942
01:07:45,510 --> 01:07:43,680
the crater maybe a little earlier than

1943
01:07:47,109 --> 01:07:45,520
it does in other places

1944
01:07:50,390 --> 01:07:47,119
because we're inside this this hole

1945
01:07:52,230 --> 01:07:50,400
we'll be looking out towards the mound

1946
01:07:53,109 --> 01:07:52,240
you know the skies will be pink of

1947
01:07:55,109 --> 01:07:53,119
course

1948
01:07:57,270 --> 01:07:55,119
we are in an equatorial site so we won't

1949
01:07:59,190 --> 01:07:57,280
have a big seasonal range of extremes

1950
01:08:00,470 --> 01:07:59,200
over the year that's one thing that

1951
01:08:03,270 --> 01:08:00,480
actually worked out pretty nicely with

1952
01:08:04,950 --> 01:08:03,280
the site but it is cold it's mars so we

1953
01:08:08,069 --> 01:08:04,960
expect

1954
01:08:09,670 --> 01:08:08,079
temperatures maybe at plus 10 fahrenheit

1955
01:08:15,270 --> 01:08:09,680
or so

1956
01:08:17,030 --> 01:08:15,280
fahrenheit at night

1957
01:08:18,870 --> 01:08:17,040
so there's a it's a good swing of

1958
01:08:20,309 --> 01:08:18,880
temperatures and the spacecraft of

1959
01:08:21,990 --> 01:08:20,319
course and all of its instruments had to

1960
01:08:24,149 --> 01:08:22,000
be designed to to withstand all these

1961
01:08:26,390 --> 01:08:24,159
things the winds are going to be

1962
01:08:28,309 --> 01:08:26,400
interesting in fact our meteorology team

1963
01:08:29,910 --> 01:08:28,319

is getting more and more excited about

1964
01:08:32,070 --> 01:08:29,920
measuring the winds

1965
01:08:34,309 --> 01:08:32,080
with this rover at this site because

1966
01:08:35,829 --> 01:08:34,319
unlike other flat sites we've had to

1967
01:08:38,229 --> 01:08:35,839
land at before

1968
01:08:39,829 --> 01:08:38,239
the the topography itself is going to be

1969
01:08:41,269 --> 01:08:39,839
driving the winds at the site there's

1970
01:08:43,590 --> 01:08:41,279
going to be winds coming down from the

1971
01:08:45,510 --> 01:08:43,600
gale mountain

1972
01:08:48,149 --> 01:08:45,520
basically these are sun these are

1973
01:08:50,070 --> 01:08:48,159
katabatic winds winds that that

1974
01:08:51,349 --> 01:08:50,080
form because of the topography as air

1975
01:08:52,550 --> 01:08:51,359
heats up

1976
01:08:55,030 --> 01:08:52,560
differently

1977
01:08:56,709 --> 01:08:55,040
and so this this wind will come down the

1978
01:08:58,550 --> 01:08:56,719
mountain in the afternoon and rise up

1979
01:09:00,870 --> 01:08:58,560
the mountain in the night won't be

1980
01:09:02,390 --> 01:09:00,880
violent no harm to the spacecraft but

1981
01:09:04,149 --> 01:09:02,400
we'll be able to measure

1982
01:09:05,269 --> 01:09:04,159
really how the winds swirl around inside

1983
01:09:07,349 --> 01:09:05,279
this crater

1984
01:09:10,070 --> 01:09:07,359
the final thing is you may notice that

1985
01:09:11,110 --> 01:09:10,080
there's dune fields around the mount

1986
01:09:12,709 --> 01:09:11,120
sharp

1987
01:09:14,229 --> 01:09:12,719
and one of the interesting things we'll

1988
01:09:16,149 --> 01:09:14,239

be doing is trying to understand how

1989
01:09:19,110 --> 01:09:16,159
that complex wind field inside this

1990
01:09:21,269 --> 01:09:19,120
crater has resulted in the geologic

1991
01:09:23,829 --> 01:09:21,279
story at gale how has it eroded the

1992
01:09:27,110 --> 01:09:23,839
mound and how has it moved these dunes

1993
01:09:28,229 --> 01:09:27,120
around that we see today

1994
01:09:30,070 --> 01:09:28,239
all right that's going to conclude

1995
01:09:31,269 --> 01:09:30,080
today's news conference thank you so

1996
01:09:33,349 --> 01:09:31,279
much for joining us i'll give you a

1997
01:09:35,829 --> 01:09:33,359
little bit of the schedule for tomorrow

1998
01:09:38,149 --> 01:09:35,839
we will be back at 9 30 a.m tomorrow

1999
01:09:40,229 --> 01:09:38,159
pacific time for our final pre-landing

2000
01:09:43,189 --> 01:09:40,239
briefing and a new update on on the

2001
01:09:45,030 --> 01:09:43,199
status of the spacecraft and landing at

2002
01:09:47,269 --> 01:09:45,040
3 p.m we invite you to join us for a

2003
01:09:49,669 --> 01:09:47,279
chat with nasa associate administrator

2004
01:09:52,870 --> 01:09:49,679
john grunsfeld and jpl director charles

2005
01:09:56,229 --> 01:09:52,880
alachi and our commentary will begin

2006
01:09:57,910 --> 01:09:56,239
tomorrow evening at 8 30 p.m pacific

2007
01:09:59,750 --> 01:09:57,920
daylight time we hope you will join us

2008
01:10:01,590 --> 01:09:59,760
for that thank you so much for joining