
NASA

1
00:00:08,870 --> 00:00:06,320
good afternoon everyone this is the

2
00:00:10,970 --> 00:00:08,880
pre-launch news conference for nasa's

3
00:00:13,549 --> 00:00:10,980
mars science laboratory with curiosity

4
00:00:15,499 --> 00:00:13,559
rover to be launched on Saturday aboard

5
00:00:19,099 --> 00:00:15,509
a United Launch Alliance Atlas 5 rocket

6
00:00:21,470 --> 00:00:19,109
from complex 41 and here to talk about

7
00:00:23,779 --> 00:00:21,480
the launch and the mission and look at

8
00:00:26,570 --> 00:00:23,789
our weather forecast for Saturday will

9
00:00:28,339 --> 00:00:26,580
begin with Colleen Hartman the assistant

10
00:00:29,990 --> 00:00:28,349
associate administrator for the science

11
00:00:34,610 --> 00:00:30,000
Mission Directorate at NASA headquarters

12
00:00:38,410 --> 00:00:34,620
in Washington Omar Baez the NASA launch

13
00:00:41,030 --> 00:00:38,420

director from the Kennedy Space Center

14
00:00:42,950 --> 00:00:41,040
burnhamthorpe the program manager for

15
00:00:48,470 --> 00:00:42,960
NASA missions from united launch

16
00:00:50,330 --> 00:00:48,480
alliance in denver Pete eisinger the MSL

17
00:00:54,670 --> 00:00:50,340
project manager from the Jet Propulsion

18
00:00:57,200 --> 00:00:54,680
Laboratory in Pasadena California and

19
00:00:59,360 --> 00:00:57,210
Joel Tom violo launch weather officer

20
00:01:02,479 --> 00:00:59,370
from the forty-fifth weather squadron at

21
00:01:04,250 --> 00:01:02,489
cape canaveral air force station and

22
00:01:06,429 --> 00:01:04,260
we'll begin first with remarks by

23
00:01:09,469 --> 00:01:06,439
colleen hartman clean thank you George

24
00:01:12,170 --> 00:01:09,479
Sir Isaac Newton wrote in a letter to

25
00:01:14,390 --> 00:01:12,180
Robert Hooke if I have seen farther than

26
00:01:17,810 --> 00:01:14,400
others it is by standing on the

27
00:01:20,060 --> 00:01:17,820
shoulders of giants NASA's past is

28
00:01:22,789 --> 00:01:20,070
filled with giant accomplishments and

29
00:01:25,429 --> 00:01:22,799
yet occasionally I'll hear the rumor

30
00:01:28,399 --> 00:01:25,439
that NASA's glory days are all in its

31
00:01:31,160 --> 00:01:28,409
past the launch of the Mars Science Lab

32
00:01:34,249 --> 00:01:31,170
and the rover Curiosity this Saturday

33
00:01:37,880 --> 00:01:34,259
and NASA's successes just this last year

34
00:01:41,780 --> 00:01:37,890
show how very very wrong that rumor

35
00:01:44,480 --> 00:01:41,790
truly is just this last year NASA in

36
00:01:46,850 --> 00:01:44,490
space and earth science has had a series

37
00:01:48,679 --> 00:01:46,860
of verse and these include our

38
00:01:51,289 --> 00:01:48,689

international partners as well so I'll

39
00:01:54,109 --> 00:01:51,299
just go through some quickly a NASA

40
00:01:56,870 --> 00:01:54,119
spacecraft was the first to ever go into

41
00:01:58,550 --> 00:01:56,880
orbit around the planet Mercury we

42
00:02:00,679 --> 00:01:58,560
launched a mission which is now looking

43
00:02:03,429 --> 00:02:00,689
at sea surface salinity of the world's

44
00:02:06,560 --> 00:02:03,439
oceans we launched a mission to Jupiter

45
00:02:11,809 --> 00:02:06,570
we launched and put into orbit a

46
00:02:14,059 --> 00:02:11,819
spacecraft around a asteroid Vesta

47
00:02:17,179 --> 00:02:14,069
and that same spacecraft will go on to a

48
00:02:19,910 --> 00:02:17,189
second asteroid in the main belt so

49
00:02:22,789 --> 00:02:19,920
really a two-for-one we launched twin

50
00:02:24,679 --> 00:02:22,799
spacecraft to the moon and we launched a

51
00:02:28,940 --> 00:02:24,689
new prototype of weather satellites

52
00:02:33,770 --> 00:02:28,950
around the earth and right now today on

53
00:02:36,199 --> 00:02:33,780
pad 39b sits a giant an atlas 5 launch

54
00:02:39,770 --> 00:02:36,209
vehicle and on the shoulders of that

55
00:02:43,129 --> 00:02:39,780
giant rests the Mars Science Lab and the

56
00:02:47,030 --> 00:02:43,139
rover Curiosity awaiting its eight and a

57
00:02:50,809 --> 00:02:47,040
half month 60 million mile journey to

58
00:02:53,509 --> 00:02:50,819
the red planet Mars and we have gotten

59
00:02:55,849 --> 00:02:53,519
here today not just by the hard work of

60
00:02:59,390 --> 00:02:55,859
scientists and engineers but by

61
00:03:02,629 --> 00:02:59,400
thousands of other people of secretaries

62
00:03:05,449 --> 00:03:02,639
and support assistants and shop managers

63
00:03:08,390 --> 00:03:05,459

and welders and NASA would like to thank

64
00:03:10,610 --> 00:03:08,400
each and every one of you and the

65
00:03:14,569 --> 00:03:10,620
families that support you for this

66
00:03:18,530 --> 00:03:14,579
amazing technological achievement now

67
00:03:22,729 --> 00:03:18,540
Mars really is the Bermuda Triangle of

68
00:03:25,789 --> 00:03:22,739
the solar system it's the death planet

69
00:03:29,449 --> 00:03:25,799
and the United States of America is the

70
00:03:33,589 --> 00:03:29,459
only nation in the world that has ever

71
00:03:36,920 --> 00:03:33,599
landed and driven robotic explorers on

72
00:03:41,089 --> 00:03:36,930
the surface of Mars and now we're set to

73
00:03:44,839 --> 00:03:41,099
do it again and this rover Curiosity

74
00:03:47,240 --> 00:03:44,849
rover is really a rover on steroids it's

75
00:03:49,789 --> 00:03:47,250
an order of magnitude more capable than

76
00:03:52,610 --> 00:03:49,799
anything we have ever launched to any

77
00:03:54,740 --> 00:03:52,620
planet in the solar system it will go

78
00:03:57,949 --> 00:03:54,750
longer it will discover more than we

79
00:04:00,469 --> 00:03:57,959
could possibly imagine but this is just

80
00:04:03,920 --> 00:04:00,479
the first step in a journey not the end

81
00:04:06,110 --> 00:04:03,930
by any means NASA is partnering more

82
00:04:10,279 --> 00:04:06,120
closely with international collaborators

83
00:04:12,429 --> 00:04:10,289
in order to prepare to return samples

84
00:04:15,259 --> 00:04:12,439
from Mars to the most sophisticated

85
00:04:19,039 --> 00:04:15,269
laboratories and on on earth to do

86
00:04:23,000 --> 00:04:19,049
detailed analysis in preparation for one

87
00:04:25,220 --> 00:04:23,010
day sending humans to Mars and I dearly

88
00:04:27,890 --> 00:04:25,230

hope I'll still be alive to

89
00:04:31,040 --> 00:04:27,900
much when that astronauts steps down on

90
00:04:36,220 --> 00:04:31,050
that rung to the very last rung and puts

91
00:04:43,370 --> 00:04:40,010
American men enabled us to go to the

92
00:04:46,310 --> 00:04:43,380
moon but many parts of humanity will be

93
00:04:50,570 --> 00:04:46,320
required in order for us to send humans

94
00:04:53,810 --> 00:04:50,580
safely to Mars so now the Mars Science

95
00:04:57,100 --> 00:04:53,820
Lab and rover Curiosity is locked and

96
00:05:01,820 --> 00:04:57,110
loaded ready for final countdown on

97
00:05:04,610 --> 00:05:01,830
Saturdays launch to Mars Thank You

98
00:05:07,460 --> 00:05:04,620
Colleen and now to the NASA launch

99
00:05:09,680 --> 00:05:07,470
director Omar Baez oh mar thank you

100
00:05:11,930 --> 00:05:09,690
George and good afternoon everyone thank

101
00:05:14,630 --> 00:05:11,940
you for attending this afternoon's brief

102
00:05:18,110 --> 00:05:14,640
I'm very humbled to be here representing

103
00:05:20,330 --> 00:05:18,120
scores of men and women from NASA the

104
00:05:22,370 --> 00:05:20,340
launch services program the Jet

105
00:05:25,190 --> 00:05:22,380
Propulsion Laboratory and our partners

106
00:05:27,580 --> 00:05:25,200
at United Launch Alliance these folks

107
00:05:31,760 --> 00:05:27,590
have been dedicated analyzing

108
00:05:34,940 --> 00:05:31,770
fabricating assembling and preparing and

109
00:05:40,280 --> 00:05:34,950
testing the Atlas 5 41 in the Curiosity

110
00:05:44,090 --> 00:05:40,290
rover on this MSL mission we are set to

111
00:05:46,310 --> 00:05:44,100
launch this saturday at 1002 am a little

112
00:05:50,810 --> 00:05:46,320
bit about the rocket we've got an atlas

113
00:05:53,630 --> 00:05:50,820

5 we call it a vo 28 is a two-stage

114
00:05:56,630 --> 00:05:53,640
mission usually utilizing a single

115
00:05:59,000 --> 00:05:56,640
engine centaur we have four solid rocket

116
00:06:03,350 --> 00:05:59,010
motors this is the first flight of that

117
00:06:07,850 --> 00:06:03,360
configuration we had the booster and

118
00:06:10,130 --> 00:06:07,860
second stage arrived on july twenty

119
00:06:12,050 --> 00:06:10,140
ninth this was the first time that we

120
00:06:15,860 --> 00:06:12,060
used the Foss mariner the ship that

121
00:06:19,100 --> 00:06:15,870
usually brings into delta course we used

122
00:06:22,240 --> 00:06:19,110
it for the atlas for the first time we

123
00:06:24,980 --> 00:06:22,250
used to use the Antonov aircraft and the

124
00:06:26,840 --> 00:06:24,990
operation was significantly streamlined

125
00:06:29,630 --> 00:06:26,850
by doing this i'm going to show you

126
00:06:31,760 --> 00:06:29,640
about two and a half months of work in

127
00:06:34,160 --> 00:06:31,770
about a minute and a half here if they

128
00:06:38,300 --> 00:06:34,170
would roll the video for me please of

129
00:06:40,700 --> 00:06:38,310
the rocket going up this is the Atlas

130
00:06:42,740 --> 00:06:40,710
booster which we started erecting on

131
00:06:45,310 --> 00:06:42,750
September 8 the nozzles at the bottom

132
00:06:48,410 --> 00:06:45,320
are the business end of the rocket

133
00:06:51,740 --> 00:06:48,420
that's the rd-180 which burns kerosene

134
00:06:53,600 --> 00:06:51,750
and liquid oxygen here are one of the

135
00:06:56,990 --> 00:06:53,610
four solid rocket motors I spoke about

136
00:07:00,830 --> 00:06:57,000
their about 67 feet tall in a hundred

137
00:07:03,770 --> 00:07:00,840
and two thousand pounds at liftoff the

138
00:07:07,190 --> 00:07:03,780

combined thrust of those four solid

139
00:07:11,080 --> 00:07:07,200
rocket motors and the rd-180 is roughly

140
00:07:13,730 --> 00:07:11,090
2 million pounds of thrust at takeoff

141
00:07:16,580 --> 00:07:13,740
here is the Centaur which was erected on

142
00:07:19,190 --> 00:07:16,590
the twenty-first of September the

143
00:07:22,100 --> 00:07:19,200
centaur after completing both of its

144
00:07:25,430 --> 00:07:22,110
burns gives us enough thrust to leave

145
00:07:29,630 --> 00:07:25,440
the planet and head to Mars we'll be

146
00:07:31,760 --> 00:07:29,640
going at about 22,500 miles per hour

147
00:07:36,560 --> 00:07:31,770
equivalent at that point when we

148
00:07:43,370 --> 00:07:36,570
separate the Atlas centaur from the from

149
00:07:45,920 --> 00:07:43,380
the MSL or the Curiosity rover here is

150
00:07:50,990 --> 00:07:45,930
the Curiosity rover with an encapsulated

151
00:07:55,490 --> 00:07:51,000
payload fairing this occurred about two

152
00:07:58,430 --> 00:07:55,500
weeks ago we set it down on the on the

153
00:08:01,070 --> 00:07:58,440
Atlas and started our testing our

154
00:08:03,950 --> 00:08:01,080
integrated systems test everything

155
00:08:05,930 --> 00:08:03,960
checked out well we then proceeded with

156
00:08:09,290 --> 00:08:05,940
putting in two very special battery for

157
00:08:15,200 --> 00:08:09,300
the Mars Curiosity rover that activity

158
00:08:18,020 --> 00:08:15,210
started last week on Friday we held our

159
00:08:19,670 --> 00:08:18,030
Flight Readiness review and it was very

160
00:08:22,130 --> 00:08:19,680
successful but at the very end we

161
00:08:24,950 --> 00:08:22,140
received word that during routine

162
00:08:27,500 --> 00:08:24,960
monitoring of the flight termination

163
00:08:31,070 --> 00:08:27,510

system batteries we had a an indication

164
00:08:33,680 --> 00:08:31,080
that one of the batteries was going bad

165
00:08:37,040 --> 00:08:33,690
and so

166
00:08:40,130 --> 00:08:37,050
we started activating a pair of

167
00:08:42,710 --> 00:08:40,140
batteries we remove the battery that was

168
00:08:45,530 --> 00:08:42,720
going bad sent it back to get inspected

169
00:08:47,360 --> 00:08:45,540
and unfortunately the time that it takes

170
00:08:49,190 --> 00:08:47,370
to activate the batteries and install it

171
00:08:52,070 --> 00:08:49,200
on the vehicle it cost us one day and

172
00:08:56,750 --> 00:08:52,080
that's why we slipped the launch from

173
00:08:59,270 --> 00:08:56,760
the 25th to the 26 this past Sunday we

174
00:09:01,310 --> 00:08:59,280
held their mission dress rehearsal to

175
00:09:04,160 --> 00:09:01,320
exercise a team and their communications

176
00:09:07,910 --> 00:09:04,170
so that we're right on the money this

177
00:09:10,070 --> 00:09:07,920
coming Saturday we held our lunch

178
00:09:12,290 --> 00:09:10,080
readiness review today no actions came

179
00:09:15,950 --> 00:09:12,300
out of that and we're clean and ready to

180
00:09:17,870 --> 00:09:15,960
go we plan on rolling out the vehicle

181
00:09:20,300 --> 00:09:17,880
out of the vertical integration facility

182
00:09:23,210 --> 00:09:20,310
on Friday morning we should be on the

183
00:09:25,400 --> 00:09:23,220
weight of the pad by 8am we will then

184
00:09:28,070 --> 00:09:25,410
connect the electrical fluid pneumatics

185
00:09:32,300 --> 00:09:28,080
and environmental control system to the

186
00:09:34,340 --> 00:09:32,310
launch vehicle and the MLP on Saturday

187
00:09:36,560 --> 00:09:34,350
the team will power up the Atlas and

188
00:09:38,630 --> 00:09:36,570

centaur at three in the morning we'll

189
00:09:41,540 --> 00:09:38,640
start our flight control checks and

190
00:09:44,930 --> 00:09:41,550
facility chill down my launch management

191
00:09:47,210 --> 00:09:44,940
team will be in place at 530am for call

192
00:09:50,000 --> 00:09:47,220
the stations we will receive a weather

193
00:09:52,130 --> 00:09:50,010
brief at seven a.m. we will then clear

194
00:09:55,370 --> 00:09:52,140
the launch complex and begin the first

195
00:09:58,250 --> 00:09:55,380
hold at t-minus two hours this is a

196
00:10:00,110 --> 00:09:58,260
30-minute built-in hold at the

197
00:10:01,760 --> 00:10:00,120
conclusion of that hold we will pull the

198
00:10:04,250 --> 00:10:01,770
team for concurrence to proceed into

199
00:10:07,460 --> 00:10:04,260
cryogenic tanking and a tanking should

200
00:10:09,320 --> 00:10:07,470
start shortly before 8am after this is

201
00:10:12,310 --> 00:10:09,330
complete we will enter a ten-minute

202
00:10:15,470 --> 00:10:12,320
built-in hold at t-minus four minutes at

203
00:10:17,120 --> 00:10:15,480
t minus 11 minutes the spacecraft will

204
00:10:19,550 --> 00:10:17,130
transition to internal power and

205
00:10:22,730 --> 00:10:19,560
initiate its timers at t minus nine

206
00:10:24,500 --> 00:10:22,740
minutes I will pull the team for

207
00:10:26,660 --> 00:10:24,510
concurrent center terminal count and

208
00:10:28,190 --> 00:10:26,670
release the hold at four minutes after

209
00:10:31,070 --> 00:10:28,200
confirmation that the spacecraft is

210
00:10:33,440 --> 00:10:31,080
configured for lunch at approximately

211
00:10:35,480 --> 00:10:33,450
four and a half minutes I will then

212
00:10:38,180 --> 00:10:35,490
inform the ula launch director that NASA

213
00:10:41,230 --> 00:10:38,190

is go for launch and the expected t0 is

214
00:10:43,879 --> 00:10:41,240
1002 in the morning our launch window

215
00:10:46,379 --> 00:10:43,889
ends at eleven-forty-five a.m.

216
00:10:49,110 --> 00:10:46,389
saturday back to you George all right

217
00:10:51,749 --> 00:10:49,120
Thank You Omar and now to Vernon Thorpe

218
00:10:55,050 --> 00:10:51,759
the program manager for NASA missions

219
00:10:56,850 --> 00:10:55,060
from united launch alliance burn hey

220
00:10:59,550 --> 00:10:56,860
thank you George good afternoon on

221
00:11:02,129 --> 00:10:59,560
behalf of Michael gas are a chief

222
00:11:04,079 --> 00:11:02,139
executive officer and the 3600 men and

223
00:11:05,549 --> 00:11:04,089
women that I work with the United Launch

224
00:11:07,710 --> 00:11:05,559
Alliance is honored to be part of the

225
00:11:10,769 --> 00:11:07,720
team that will launch this exciting

226
00:11:13,410 --> 00:11:10,779
mission to Mars this is you la's 11th

227
00:11:16,530 --> 00:11:13,420
launch of this year and ms l will mark

228
00:11:18,329 --> 00:11:16,540
the 56th launch for our company in just

229
00:11:20,699 --> 00:11:18,339
60 months the five years that we've been

230
00:11:23,389 --> 00:11:20,709
around we've worked together with our

231
00:11:26,309 --> 00:11:23,399
NASA launch services program customer on

232
00:11:28,819 --> 00:11:26,319
five major launch campaigns this year in

233
00:11:31,739 --> 00:11:28,829
addition to our current MSL activities

234
00:11:34,799 --> 00:11:31,749
we've also launched the Aquarius Juno

235
00:11:37,530 --> 00:11:34,809
Grail and npp missions in just the last

236
00:11:39,150 --> 00:11:37,540
five months our teams have worked

237
00:11:41,429 --> 00:11:39,160
tremendously hard to get us to this

238
00:11:42,989 --> 00:11:41,439

point in the MSL campaign and on

239
00:11:44,850 --> 00:11:42,999
Saturday morning we'll be ready to

240
00:11:46,519 --> 00:11:44,860
launch the Curiosity rover on its

241
00:11:49,170 --> 00:11:46,529
nine-month journey to the red planet

242
00:11:52,530 --> 00:11:49,180
this mission will be launched aboard an

243
00:11:54,749 --> 00:11:52,540
atlas 5 541 configuration vehicle as

244
00:11:57,240 --> 00:11:54,759
Omar described that includes a five

245
00:12:00,929 --> 00:11:57,250
metre fairing provided by ruag space the

246
00:12:04,290 --> 00:12:00,939
four Aerojet provided strap on solid

247
00:12:06,240 --> 00:12:04,300
rocket boosters and the rd-180 booster

248
00:12:09,600 --> 00:12:06,250
stage or the Atlas booster stage is

249
00:12:12,900 --> 00:12:09,610
powered by the rd-180 engine from RT am

250
00:12:14,850 --> 00:12:12,910
ross and the Centaur upper stage will be

251
00:12:18,090 --> 00:12:14,860
powered by a single pratt & whitney RL

252
00:12:20,340 --> 00:12:18,100
10a engine I will now show a video that

253
00:12:24,689 --> 00:12:20,350
summarizes the events that will see on

254
00:12:26,549 --> 00:12:24,699
launch day we could roll that you're

255
00:12:28,470 --> 00:12:26,559
seeing actual footage here from the Juno

256
00:12:31,949 --> 00:12:28,480
launch this last August that had a very

257
00:12:36,419 --> 00:12:31,959
similar configuration that was a 551 the

258
00:12:37,949 --> 00:12:36,429
MSL mission requires one less SRB will

259
00:12:39,989 --> 00:12:37,959
lift off with about two million pounds

260
00:12:42,059 --> 00:12:39,999
of thrust vehicle weight at this time is

261
00:12:43,350 --> 00:12:42,069
on the order of 1.2 million pounds would

262
00:12:46,169 --> 00:12:43,360
get a good healthy thrust-to-weight

263
00:12:47,970 --> 00:12:46,179

ratio the first major event you'll see

264
00:12:49,619 --> 00:12:47,980
after liftoff will be the burnout and

265
00:12:51,160 --> 00:12:49,629
jettison of the four solid rocket

266
00:12:52,540 --> 00:12:51,170
boosters they'll burn out about him

267
00:12:55,389 --> 00:12:52,550
and a half in the flight will jettison

268
00:12:57,639 --> 00:12:55,399
them shortly after that a couple of

269
00:13:00,430 --> 00:12:57,649
minutes later you'll see the next major

270
00:13:02,110 --> 00:13:00,440
event that you can see from the ground

271
00:13:05,170 --> 00:13:02,120
and that will be a jettison of the

272
00:13:07,990 --> 00:13:05,180
5-meter payload fairing will continue to

273
00:13:09,550 --> 00:13:08,000
burn the booster for another minute so

274
00:13:11,110 --> 00:13:09,560
four and a half minutes total at that

275
00:13:14,110 --> 00:13:11,120
point we will have depleted the Booster

276
00:13:16,480 --> 00:13:14,120
propellants and will shut down the

277
00:13:19,620 --> 00:13:16,490
engine and separate that stage from the

278
00:13:21,610 --> 00:13:19,630
Centaur upper stage at that point

279
00:13:23,290 --> 00:13:21,620
centaur will prepare to light its

280
00:13:26,740 --> 00:13:23,300
engines for the first of two engine

281
00:13:29,470 --> 00:13:26,750
burns the first engine burn will last

282
00:13:32,590 --> 00:13:29,480
about seven minutes and it will put the

283
00:13:36,610 --> 00:13:32,600
Centaur with MSL on top into a low-earth

284
00:13:39,189 --> 00:13:36,620
parking orbit following that first burn

285
00:13:41,819 --> 00:13:39,199
will enter a Coast period it will last

286
00:13:45,970 --> 00:13:41,829
about nineteen and a half minutes and

287
00:13:51,610 --> 00:13:45,980
after that coast we will be in position

288
00:13:55,480 --> 00:13:51,620

for the second burn that second burn

289
00:13:59,050 --> 00:13:55,490
will last about eight minutes and once

290
00:14:01,600 --> 00:13:59,060
that second burn is completed we will be

291
00:14:03,699 --> 00:14:01,610
on an escape trajectory and on our way

292
00:14:05,290 --> 00:14:03,709
to Mars four minutes after that second

293
00:14:08,620 --> 00:14:05,300
burdens completed will reorient the

294
00:14:10,000 --> 00:14:08,630
vehicle and separate the spacecraft so

295
00:14:13,240 --> 00:14:10,010
those are the events that we hope to see

296
00:14:15,430 --> 00:14:13,250
total mission duration until we separate

297
00:14:16,810 --> 00:14:15,440
the spacecraft will be about 42 minutes

298
00:14:18,460 --> 00:14:16,820
from liftoff and that could vary a

299
00:14:20,170 --> 00:14:18,470
little bit depending on the actual time

300
00:14:22,660 --> 00:14:20,180
that we lift off yeah I think you can

301
00:14:26,319 --> 00:14:22,670
run anywhere from about 36 22 44 minutes

302
00:14:27,670 --> 00:14:26,329
I want you to know that you la is proud

303
00:14:30,100 --> 00:14:27,680
to play a critical role in delivering

304
00:14:31,870 --> 00:14:30,110
one of a kind NASA payloads to orbit in

305
00:14:34,030 --> 00:14:31,880
support of the global science community

306
00:14:36,610 --> 00:14:34,040
we are focused on perfect product

307
00:14:38,439 --> 00:14:36,620
delivery for MSL and for every mission

308
00:14:40,689 --> 00:14:38,449
that we launch for NASA and all of our

309
00:14:42,699 --> 00:14:40,699
other customers perfect product delivery

310
00:14:45,490 --> 00:14:42,709
includes a relentless focus on mission

311
00:14:48,129 --> 00:14:45,500
success focus on one launch at a time

312
00:14:50,860 --> 00:14:48,139
and continuous improvement in meeting

313
00:14:52,720 --> 00:14:50,870

the needs of our customers this mission

314
00:14:55,180 --> 00:14:52,730
represents the culmination of years of

315
00:14:57,189 --> 00:14:55,190
hard work by NASA and the ula launch

316
00:15:00,759 --> 00:14:57,199
teams I believe we began integrating

317
00:15:02,439 --> 00:15:00,769
this mission on to Atlas in 2006 and we

318
00:15:04,110 --> 00:15:02,449
look forward to curiosity's landing on

319
00:15:06,000 --> 00:15:04,120
the surface of Mars and to learning

320
00:15:08,579 --> 00:15:06,010
one of the Mars environment is capable

321
00:15:10,019 --> 00:15:08,589
of supporting microbial life thank you

322
00:15:11,430 --> 00:15:10,029
to all of our mission partners who have

323
00:15:13,410 --> 00:15:11,440
worked so hard to ensure that this

324
00:15:16,320 --> 00:15:13,420
mission will be a success back to you

325
00:15:18,930 --> 00:15:16,330
George Thank You Vern and now to Pete

326
00:15:20,700 --> 00:15:18,940
Ising her the project manager for the

327
00:15:24,060 --> 00:15:20,710
Mars Science Laboratory Jet Propulsion

328
00:15:29,040 --> 00:15:24,070
Laboratory Pete and thank you George and

329
00:15:31,140 --> 00:15:29,050
in good afternoon everyone so is a major

330
00:15:33,810 --> 00:15:31,150
event for us to be at this point in time

331
00:15:36,210 --> 00:15:33,820
with with ms l and the rover curiosity

332
00:15:40,230 --> 00:15:36,220
has been a major in long-term

333
00:15:42,540 --> 00:15:40,240
development and and as an choline and

334
00:15:43,800 --> 00:15:42,550
vernon and omar said there's been a

335
00:15:46,050 --> 00:15:43,810
tremendous number of people who have

336
00:15:48,180 --> 00:15:46,060
been involved in getting us together to

337
00:15:49,410 --> 00:15:48,190
this point in time and their support and

338
00:15:52,890 --> 00:15:49,420

their families support has been

339
00:15:54,600 --> 00:15:52,900
instrumental in our in our success like

340
00:15:56,160 --> 00:15:54,610
to pick up the story where Vern has has

341
00:16:00,780 --> 00:15:56,170
left it off if I could see the animation

342
00:16:03,360 --> 00:16:00,790
please so this shows the beginning of

343
00:16:04,980 --> 00:16:03,370
the second death of centaur burn and and

344
00:16:07,740 --> 00:16:04,990
puts us in the hyperbolic escape

345
00:16:10,650 --> 00:16:07,750
trajectory to Mars the Centaur spins us

346
00:16:14,490 --> 00:16:10,660
up and then ejects uh separates us in

347
00:16:17,040 --> 00:16:14,500
the proper attitude for solar power and

348
00:16:19,410 --> 00:16:17,050
communication to earth the crews to Mars

349
00:16:22,380 --> 00:16:19,420
is eight and a half months and we

350
00:16:24,540 --> 00:16:22,390
arrived on the fifth of August in the

351
00:16:25,710 --> 00:16:24,550
pacific time zone or the sixth of august

352
00:16:28,110 --> 00:16:25,720
here on the east coast in the in the

353
00:16:30,720 --> 00:16:28,120
evening about ten minutes out we eject

354
00:16:33,570 --> 00:16:30,730
the crew stage we arrive at Mars at

355
00:16:35,460 --> 00:16:33,580
about 12,000 miles an hour we're using a

356
00:16:37,530 --> 00:16:35,470
guided entry this is a small thruster

357
00:16:39,090 --> 00:16:37,540
flash as you see in order to make the

358
00:16:40,920 --> 00:16:39,100
landing ellipse much smaller than it was

359
00:16:42,660 --> 00:16:40,930
on the mars exploration rover project

360
00:16:47,610 --> 00:16:42,670
will be able to land an ellipse about 20

361
00:16:49,380 --> 00:16:47,620
kilometers circular ue the heat shield

362
00:16:50,940 --> 00:16:49,390
dissipates about ninety-eight percent of

363
00:16:54,780 --> 00:16:50,950

the energy we get when we arrive at Mars

364
00:16:59,220 --> 00:16:54,790
and around mach mach 2 we will deploy

365
00:17:03,579 --> 00:17:01,780
that will continue to slow us down until

366
00:17:06,460 --> 00:17:03,589
we go subsonic at which point the heat

367
00:17:08,169 --> 00:17:06,470
shield will will fall off and will

368
00:17:10,539 --> 00:17:08,179
continue to send to the surface until

369
00:17:12,760 --> 00:17:10,549
we're about a mile or mile and a half

370
00:17:14,380 --> 00:17:12,770
off the surface when we drop out the

371
00:17:16,840 --> 00:17:14,390
descent stage with the rover underneath

372
00:17:19,600 --> 00:17:16,850
it and we descend on eight propulsive

373
00:17:22,689 --> 00:17:19,610
engines for that final approximately two

374
00:17:24,520 --> 00:17:22,699
to four kilometers at this point we have

375
00:17:26,199 --> 00:17:24,530
radar lock on the ground with adopter

376
00:17:28,900 --> 00:17:26,209
radar which shows us both range and

377
00:17:31,270 --> 00:17:28,910
range rate and approximately 200 feet

378
00:17:35,620 --> 00:17:31,280
off the ground we deploy the the rover

379
00:17:38,130 --> 00:17:35,630
alone a 13 meter bridle that's the sky

380
00:17:41,080 --> 00:17:38,140
crane maneuver and then we will do a

381
00:17:45,430 --> 00:17:41,090
constant rate three-quarters of a meter

382
00:17:47,680 --> 00:17:45,440
per second motion toward the surface we

383
00:17:49,659 --> 00:17:47,690
land on the mobility system that is

384
00:17:53,380 --> 00:17:49,669
sensed by the descent stage which then

385
00:17:55,390 --> 00:17:53,390
cuts the umbilicals and and then flies

386
00:17:56,799 --> 00:17:55,400
away about half we call out kilometer to

387
00:18:00,850 --> 00:17:56,809
three-quarters of a kilometer away where

388
00:18:04,419 --> 00:18:00,860

it where it crashes and so there are six

389
00:18:06,730 --> 00:18:04,429
curiosity on the Martian surface and we

390
00:18:09,039 --> 00:18:06,740
will we will not deploy is different

391
00:18:10,899 --> 00:18:09,049
from from Mars Exploration Rover we will

392
00:18:12,789 --> 00:18:10,909
not deploy our mast on that first day

393
00:18:14,500 --> 00:18:12,799
because we'll want to assess the

394
00:18:16,419 --> 00:18:14,510
stability of the rover since it's so

395
00:18:19,149 --> 00:18:16,429
large on the terrain in which we placed

396
00:18:21,399 --> 00:18:19,159
it but the second day we will deploy the

397
00:18:25,149 --> 00:18:21,409
mast and and shortly thereafter will

398
00:18:28,480 --> 00:18:25,159
begin our science investigation we use

399
00:18:31,360 --> 00:18:28,490
the cameras to to select targets and

400
00:18:33,039 --> 00:18:31,370
we'll be moving toward targets both in

401
00:18:35,380 --> 00:18:33,049
the landing ellipse and exterior to the

402
00:18:37,480 --> 00:18:35,390
landing ellipse the speed of the rover

403
00:18:41,520 --> 00:18:37,490
is about a tenth of a mile per hour just

404
00:18:44,169 --> 00:18:41,530
as it was on on em er when we find

405
00:18:47,140 --> 00:18:44,179
valuable targets we will we will go up

406
00:18:50,409 --> 00:18:47,150
to them and in both with the cameras and

407
00:18:52,690 --> 00:18:50,419
then with what is chemcam we will look

408
00:18:55,090 --> 00:18:52,700
in and determine targets that we might

409
00:18:58,930 --> 00:18:55,100
want to use sampling on you can then

410
00:19:01,600 --> 00:18:58,940
deploy our arm is about which contains

411
00:19:03,250 --> 00:19:01,610
about 30 30 kilograms or so of

412
00:19:05,529 --> 00:19:03,260
engineering equipment and scientific

413
00:19:08,139 --> 00:19:05,539

equipment at the end

414
00:19:09,599 --> 00:19:08,149
we have to institute instruments there

415
00:19:13,109 --> 00:19:09,609
that can look at alpha particle

416
00:19:16,509 --> 00:19:13,119
spectrometry and also a hand lens camera

417
00:19:18,310 --> 00:19:16,519
but the real real reason the arm is

418
00:19:21,389 --> 00:19:18,320
there is to is to collect samples

419
00:19:24,279 --> 00:19:21,399
through a percussion rotary light drill

420
00:19:26,049 --> 00:19:24,289
this shows that that process and the

421
00:19:29,499 --> 00:19:26,059
clock indicates it's that's not real

422
00:19:32,320 --> 00:19:29,509
time we then auger material into the

423
00:19:35,349 --> 00:19:32,330
drill and and we'll prepare it and

424
00:19:37,479 --> 00:19:35,359
process it for for injection into one of

425
00:19:38,950 --> 00:19:37,489
two instruments I think this will show

426
00:19:41,409 --> 00:19:38,960
the injection into the chemin instrument

427
00:19:43,839 --> 00:19:41,419
in in the rover the other is the Sam

428
00:19:46,330 --> 00:19:43,849
instrument or science analysis at Mars

429
00:19:48,279 --> 00:19:46,340
instrument the chemin instrument is a

430
00:19:52,119 --> 00:19:48,289
x-ray diffraction instrument and this

431
00:19:54,430 --> 00:19:52,129
shows the sample being being projected

432
00:19:56,320 --> 00:19:54,440
that subjected to x rays which form an

433
00:19:58,450 --> 00:19:56,330
x-ray diffraction pattern on the ccd

434
00:20:01,389 --> 00:19:58,460
from which crystallography and

435
00:20:03,909 --> 00:20:01,399
mineralogical information can be

436
00:20:06,339 --> 00:20:03,919
obtained the rover is meant to Rove

437
00:20:09,099 --> 00:20:06,349
about 20 kilometers in its 1 Martian

438
00:20:12,999 --> 00:20:09,109

year which is 687 day earth earth day

439
00:20:14,349 --> 00:20:13,009
life and so that's kind of a capsule

440
00:20:16,869 --> 00:20:14,359
summary of the mission we'll talk more

441
00:20:19,060 --> 00:20:16,879
about that when we get to the pre

442
00:20:21,099 --> 00:20:19,070
landing events of course in order to get

443
00:20:22,450 --> 00:20:21,109
to this point in time as we've talked

444
00:20:26,649 --> 00:20:22,460
about before there's a lot of work that

445
00:20:29,080 --> 00:20:26,659
has to go on to take place you were

446
00:20:31,239 --> 00:20:29,090
shown the the build up of the Atlas if I

447
00:20:33,159 --> 00:20:31,249
can have next animation please we'll

448
00:20:35,950 --> 00:20:33,169
talk about how the rover the story of

449
00:20:40,089 --> 00:20:35,960
the rover here at Kennedy we arrived on

450
00:20:42,580 --> 00:20:40,099
a c-17 we we trucked mechanical support

451
00:20:44,979 --> 00:20:42,590
equipment across the country from JPL in

452
00:20:46,869 --> 00:20:44,989
Pasadena but we flew both the cruise

453
00:20:49,089 --> 00:20:46,879
stage and then on a later flight the

454
00:20:51,580 --> 00:20:49,099
descent stage and the rover here on

455
00:20:56,499 --> 00:20:51,590
c-17s from March Air Force Base in San

456
00:20:59,019 --> 00:20:56,509
Bernardino crew stage arrived in may and

457
00:21:01,539 --> 00:20:59,029
the descent stage arrived in in May

458
00:21:04,570 --> 00:21:01,549
descent stage and Rover arrived at in

459
00:21:07,149 --> 00:21:04,580
June this shows the cruise stage being

460
00:21:09,099 --> 00:21:07,159
spun to determine mass properties and

461
00:21:11,049 --> 00:21:09,109
also as a check out with a spin table

462
00:21:13,599 --> 00:21:11,059
for the later heavier mass descent stage

463
00:21:16,239 --> 00:21:13,609

and and Rover that would be required

464
00:21:17,740 --> 00:21:16,249
here's the descent stage being unwrapped

465
00:21:23,070 --> 00:21:17,750
from its pack

466
00:21:28,750 --> 00:21:25,990
the very complex piece of equipment that

467
00:21:31,480 --> 00:21:28,760
is roughly the same mass as the rover

468
00:21:32,800 --> 00:21:31,490
when it is fuel this shows the rover and

469
00:21:35,650 --> 00:21:32,810
it's a and it's ready to launch

470
00:21:38,440 --> 00:21:35,660
configuration the final covers being

471
00:21:41,410 --> 00:21:38,450
removed from the from the wheels this is

472
00:21:45,000 --> 00:21:41,420
a pathfinder activity for installing the

473
00:21:47,530 --> 00:21:45,010
RTG shows how it was done on the pad

474
00:21:51,430 --> 00:21:47,540
although in that case we did not have a

475
00:21:53,410 --> 00:21:51,440
course the fairing around it showing the

476
00:21:56,020 --> 00:21:53,420
mass being raised as final functional

477
00:22:03,280 --> 00:21:56,030
testing of the of the vehicle here took

478
00:22:06,520 --> 00:22:03,290
place ok here the descent stage is being

479
00:22:08,650 --> 00:22:06,530
placed on top of the rover the red cages

480
00:22:10,570 --> 00:22:08,660
around the main and landing engines are

481
00:22:13,900 --> 00:22:10,580
for protection they are red moving for

482
00:22:15,610 --> 00:22:13,910
flight items you can see here the

483
00:22:20,650 --> 00:22:15,620
descent vehicle and here it is being

484
00:22:22,780 --> 00:22:20,660
placed into the back shell it's actually

485
00:22:24,370 --> 00:22:22,790
elevated into the back shell and here

486
00:22:26,200 --> 00:22:24,380
the back shell is being elevated onto

487
00:22:27,940 --> 00:22:26,210
the cruise stage and then the final

488
00:22:30,640 --> 00:22:27,950

process is the placing of the heat

489
00:22:38,860 --> 00:22:30,650
shield onto the under the bottom of the

490
00:22:42,490 --> 00:22:38,870
vehicle you can see that here there we

491
00:22:44,050 --> 00:22:42,500
have the fully built up over having a

492
00:22:45,640 --> 00:22:44,060
fluid buildup vehicle and here is the

493
00:22:46,900 --> 00:22:45,650
last time we got to really see it and

494
00:22:49,330 --> 00:22:46,910
take a picture as it was being

495
00:22:50,920 --> 00:22:49,340
encapsulated interfering and that

496
00:22:54,040 --> 00:22:50,930
occurred about the the second of

497
00:22:57,790 --> 00:22:54,050
November no excuse me about the 24th of

498
00:23:01,150 --> 00:22:57,800
october and and then it was a ship to

499
00:23:02,740 --> 00:23:01,160
launch site 41 when it was boosted on to

500
00:23:04,810 --> 00:23:02,750
the under the rocket on the second in

501
00:23:07,600 --> 00:23:04,820
november we've had a tremendous

502
00:23:10,290 --> 00:23:07,610
experience here in florida the support

503
00:23:13,270 --> 00:23:10,300
from the kennedy center and from the

504
00:23:15,460 --> 00:23:13,280
NASA part of that supporting launch

505
00:23:19,330 --> 00:23:15,470
vehicle operations and from ula has been

506
00:23:21,160 --> 00:23:19,340
superb we've had our kind of normal

507
00:23:23,080 --> 00:23:21,170
challenges and hiccups that we that we

508
00:23:24,580 --> 00:23:23,090
have in these kinds of major operations

509
00:23:27,580 --> 00:23:24,590
but things have gone extremely smoothly

510
00:23:29,070 --> 00:23:27,590
and and we are fully prepared to go on

511
00:23:31,620 --> 00:23:29,080
on Saturday morning and

512
00:23:33,900 --> 00:23:31,630
hope that the weather cooperates to

513
00:23:36,750 --> 00:23:33,910

thank you p and now for the weather

514
00:23:39,120 --> 00:23:36,760
forecast on saturday our launch weather

515
00:23:41,010 --> 00:23:39,130
officer from the US Air Force 45th

516
00:23:42,840 --> 00:23:41,020
weather squadron Joel Tom viola Joel

517
00:23:45,870 --> 00:23:42,850
thank you George good afternoon everyone

518
00:23:47,220 --> 00:23:45,880
well basically between now and Saturday

519
00:23:49,140 --> 00:23:47,230
morning we will have a few weather

520
00:23:51,810 --> 00:23:49,150
changes that take place if I could have

521
00:23:53,730 --> 00:23:51,820
the current satellite picture up to show

522
00:23:55,830 --> 00:23:53,740
you what the current conditions are you

523
00:23:58,530 --> 00:23:55,840
can see that band of clouds stretching

524
00:24:00,270 --> 00:23:58,540
across the state east to west we have a

525
00:24:03,900 --> 00:24:00,280
cold front that's moving down the state

526
00:24:05,580 --> 00:24:03,910
and the above normal temperatures and

527
00:24:08,010 --> 00:24:05,590
humidity we've been experiencing over

528
00:24:10,320 --> 00:24:08,020
the last few days well and this will be

529
00:24:13,080 --> 00:24:10,330
the last day for that that cold front is

530
00:24:14,280 --> 00:24:13,090
expected to move through the area this

531
00:24:16,770 --> 00:24:14,290
evening and maybe throughout the

532
00:24:19,260 --> 00:24:16,780
overnight hours now what we'll see once

533
00:24:20,930 --> 00:24:19,270
that cold front moves through the winds

534
00:24:23,940 --> 00:24:20,940
will shift in a clockwise fashion

535
00:24:26,340 --> 00:24:23,950
basically from the southwest which they

536
00:24:28,260 --> 00:24:26,350
are right now all the way around to more

537
00:24:30,210 --> 00:24:28,270
of an easterly wind by the time we get

538
00:24:32,250 --> 00:24:30,220

to a Saturday morning so we're going to

539
00:24:33,720 --> 00:24:32,260
have that little bit of change the wind

540
00:24:35,280 --> 00:24:33,730
speeds after the cold front moves

541
00:24:37,440 --> 00:24:35,290
through will be gusty they'll be

542
00:24:39,930 --> 00:24:37,450
probably well into the 20s over the next

543
00:24:42,590 --> 00:24:39,940
two or three days but are not expected

544
00:24:44,640 --> 00:24:42,600
to exceed any of the launch vehicle

545
00:24:47,070 --> 00:24:44,650
constraints or lift off constraints as

546
00:24:48,420 --> 00:24:47,080
we get closer to launch the other thing

547
00:24:51,120 --> 00:24:48,430
that we're going to be monitoring a

548
00:24:53,250 --> 00:24:51,130
typical scenario what we see here once a

549
00:24:55,020 --> 00:24:53,260
cold front moves through is that once

550
00:24:57,420 --> 00:24:55,030
the winds shift all the way around to

551
00:24:58,980 --> 00:24:57,430
the northeast and east and the cooler

552
00:25:01,530 --> 00:24:58,990
air behind the front moves over the

553
00:25:04,740 --> 00:25:01,540
warmer ocean we tend to get a lot of

554
00:25:06,990 --> 00:25:04,750
low-level not nothing what we call flat

555
00:25:10,020 --> 00:25:07,000
clouds or low-level clouds form over the

556
00:25:12,180 --> 00:25:10,030
ocean and because of the eventual

557
00:25:14,880 --> 00:25:12,190
northeast and east winds some of those

558
00:25:17,580 --> 00:25:14,890
clouds could move onshore as we get into

559
00:25:19,530 --> 00:25:17,590
a Friday and Saturday timeframe and

560
00:25:21,900 --> 00:25:19,540
we're going to be monitoring those lower

561
00:25:24,660 --> 00:25:21,910
level clouds moving over the launch site

562
00:25:27,720 --> 00:25:24,670
for cloud ceilings and a couple of our

563
00:25:30,000 --> 00:25:27,730

triggered lightning rules as we get into

564
00:25:32,660 --> 00:25:30,010
a Friday morning for the role and out to

565
00:25:34,860 --> 00:25:32,670
the pad not anticipating any concerns

566
00:25:37,020 --> 00:25:34,870
again the winds at that time will

567
00:25:39,210 --> 00:25:37,030
probably be out of the Northeast they

568
00:25:41,460 --> 00:25:39,220
will be gusting in the 20s but again not

569
00:25:43,110 --> 00:25:41,470
expected to exceed any role constraints

570
00:25:44,580 --> 00:25:43,120
and we're certainly not in

571
00:25:48,180 --> 00:25:44,590
pending any lightning of things of that

572
00:25:50,430 --> 00:25:48,190
nature during that time frame once we

573
00:25:52,320 --> 00:25:50,440
get into Saturday morning the forecast

574
00:25:54,600 --> 00:25:52,330
the winds will continue to shift around

575
00:25:56,820 --> 00:25:54,610
to the east right now we're looking at

576
00:25:59,250 --> 00:25:56,830
wind speeds being on the order of 20

577
00:26:01,049 --> 00:25:59,260
knots gusting the 24 again that will be

578
00:26:03,299 --> 00:26:01,059
below the wind threshold when the

579
00:26:06,180 --> 00:26:03,309
liftoff threshold right now the forecast

580
00:26:08,520 --> 00:26:06,190
cloud cover is a scattered deck at 3,500

581
00:26:12,330 --> 00:26:08,530
feet now there is a mission flight rule

582
00:26:13,799 --> 00:26:12,340
that states that if the ceiling if it

583
00:26:15,690 --> 00:26:13,809
becomes a ceiling or in other words that

584
00:26:18,000 --> 00:26:15,700
the clouds become broken or greater in

585
00:26:20,430 --> 00:26:18,010
terms of cloud coverage if that the

586
00:26:23,220 --> 00:26:20,440
ceiling of that clouds is 6,000 feet or

587
00:26:28,020 --> 00:26:23,230
less then they have to go through some

588
00:26:29,460 --> 00:26:28,030

more observation to be able to continue

589
00:26:30,990 --> 00:26:29,470
on the launch because they need to see

590
00:26:33,090 --> 00:26:31,000
the launch vehicle off the pad and

591
00:26:35,190 --> 00:26:33,100
through a certain amount of time but the

592
00:26:37,530 --> 00:26:35,200
cloud forecast is for not to have that

593
00:26:39,510 --> 00:26:37,540
violated again a scattered deck at 3,500

594
00:26:42,630 --> 00:26:39,520
feet and another scattered deck at

595
00:26:44,910 --> 00:26:42,640
around 30,000 feet the other constraint

596
00:26:46,740 --> 00:26:44,920
for the mission flight rules a ceiling

597
00:26:49,320 --> 00:26:46,750
of four miles but we're anticipating

598
00:26:51,330 --> 00:26:49,330
seven miles visibility from not looking

599
00:26:54,090 --> 00:26:51,340
at any problems there there could be a

600
00:26:55,770 --> 00:26:54,100
couple showers over the ocean whenever

601
00:26:57,840 --> 00:26:55,780
we have the winds and cooler air moving

602
00:26:59,490 --> 00:26:57,850
off the ocean not only do we have these

603
00:27:01,650 --> 00:26:59,500
clouds form but there could be a little

604
00:27:03,900 --> 00:27:01,660
few light showers in the area so we'll

605
00:27:06,360 --> 00:27:03,910
be monitoring that and right now the

606
00:27:09,360 --> 00:27:06,370
temperature at liftoff is expected to be

607
00:27:12,810 --> 00:27:09,370
in the low 70s between 71 and 72 degrees

608
00:27:15,600 --> 00:27:12,820
and right now the overall probability of

609
00:27:18,060 --> 00:27:15,610
violation is thirty percent with the two

610
00:27:20,100 --> 00:27:18,070
concerns being a the cumulus cloud rule

611
00:27:23,010 --> 00:27:20,110
which is a triggered lightning rule and

612
00:27:26,880 --> 00:27:23,020
that cloud ceilings of being 6,000 feet

613
00:27:29,549 --> 00:27:26,890

or lower if we were to go into the next

614
00:27:31,290 --> 00:27:29,559
day on Sunday that winds will continue a

615
00:27:33,990 --> 00:27:31,300
clockwise shift and we come more

616
00:27:35,850 --> 00:27:34,000
southeasterly on Sunday other than that

617
00:27:37,919 --> 00:27:35,860
pretty much the same weather conditions

618
00:27:40,410 --> 00:27:37,929
that we're going to see on Saturday the

619
00:27:42,000 --> 00:27:40,420
clouds will still be at you know the

620
00:27:44,010 --> 00:27:42,010
lowest cloud decks expect to be around

621
00:27:46,260 --> 00:27:44,020
3,000 feet that day but still scattered

622
00:27:49,440 --> 00:27:46,270
again you have to have a broken deck or

623
00:27:52,200 --> 00:27:49,450
greater for a cloud seem to be an issue

624
00:27:54,300 --> 00:27:52,210
good visibility the winds will be more

625
00:27:56,250 --> 00:27:54,310
out of the southeast a little bit weaker

626
00:27:59,160 --> 00:27:56,260
16 peak in the 22 now

627
00:28:02,610 --> 00:27:59,170
and the temperature about the same 71 to

628
00:28:04,230 --> 00:28:02,620
73 degrees and as a case on saturday

629
00:28:06,270 --> 00:28:04,240
morning the overall probability of

630
00:28:09,180 --> 00:28:06,280
constraint violation on sunday morning

631
00:28:12,090 --> 00:28:09,190
if needed would be thirty percent now if

632
00:28:14,400 --> 00:28:12,100
we were to go into Monday conditions

633
00:28:16,770 --> 00:28:14,410
deteriorate our next cold front is

634
00:28:18,960 --> 00:28:16,780
expected to move into Florida on an on

635
00:28:21,570 --> 00:28:18,970
Monday timeframe so because of that

636
00:28:23,100 --> 00:28:21,580
we'll be looking at up higher winds and

637
00:28:24,870 --> 00:28:23,110
a lot more of our cloud rules being

638
00:28:26,880 --> 00:28:24,880

violated and we're going to be looking

639
00:28:29,550 --> 00:28:26,890
at a seventy percent chance of violation

640
00:28:31,470 --> 00:28:29,560
and again that only holds true if we

641
00:28:33,120 --> 00:28:31,480
were to have a two-day slip into Monday

642
00:28:35,130 --> 00:28:33,130
morning but right now Saturday

643
00:28:36,660 --> 00:28:35,140
conditions look good we're just going to

644
00:28:39,390 --> 00:28:36,670
be monitoring the clouds make sure the

645
00:28:40,950 --> 00:28:39,400
ceilings aren't too low and there's no

646
00:28:43,350 --> 00:28:40,960
showers moving overhead and other than

647
00:28:45,000 --> 00:28:43,360
that we'll be in good shape that

648
00:28:47,250 --> 00:28:45,010
concludes George all right Thank You

649
00:28:48,930 --> 00:28:47,260
Joel we're ready now to take questions

650
00:28:51,540 --> 00:28:48,940
so please give your name and affiliation

651
00:28:54,140 --> 00:28:51,550
when the microphone comes to you we'll

652
00:28:56,430 --> 00:28:54,150
start here in the front with Marsha

653
00:28:59,210 --> 00:28:56,440
Washington Associated Press for mr.

654
00:29:01,380 --> 00:28:59,220
Steger you mentioned a 20-kilometre

655
00:29:03,990 --> 00:29:01,390
odometer reading you're hoping for it

656
00:29:07,380 --> 00:29:04,000
during the prime mission how much more

657
00:29:08,880 --> 00:29:07,390
could the rover travel and how does 20

658
00:29:12,890 --> 00:29:08,890
kilometers compared to some of the other

659
00:29:16,920 --> 00:29:12,900
Rovers and what they actually achieved

660
00:29:19,800 --> 00:29:16,930
well the the requirement for em er was a

661
00:29:22,860 --> 00:29:19,810
kilometer and of course we've been much

662
00:29:25,830 --> 00:29:22,870
more successful than that the the

663
00:29:30,390 --> 00:29:25,840

requirement for for curiosity is 20

664
00:29:33,750 --> 00:29:30,400
kilometers we test mechanism equipment

665
00:29:35,790 --> 00:29:33,760
22 x + 3 x life and so we've actually

666
00:29:38,250 --> 00:29:35,800
tested the actuators that drive the

667
00:29:40,230 --> 00:29:38,260
motors to an equivalent distance of

668
00:29:42,450 --> 00:29:40,240
forty kilometers and then in fact have

669
00:29:45,840 --> 00:29:42,460
done cold temperature testing even

670
00:29:48,630 --> 00:29:45,850
beyond that there really is no life

671
00:29:51,060 --> 00:29:48,640
living in characteristic of the rover in

672
00:29:52,650 --> 00:29:51,070
terms of something that we know that

673
00:29:55,290 --> 00:29:52,660
will run out of a consumable in some

674
00:29:58,170 --> 00:29:55,300
period of time it's question of where

675
00:30:02,940 --> 00:29:58,180
out and and and so we'll see how it

676
00:30:04,530 --> 00:30:02,950
really plays you know we've we have a

677
00:30:06,660 --> 00:30:04,540
set of requirements and we tested those

678
00:30:08,220 --> 00:30:06,670
requirements plus some margin and and we

679
00:30:08,899 --> 00:30:08,230
don't test a failure so we can't really

680
00:30:11,960 --> 00:30:08,909
tell you

681
00:30:14,930 --> 00:30:11,970
the what the expected life might be okay

682
00:30:17,570 --> 00:30:14,940
I can't Kramer I'm for Space Flight

683
00:30:19,999 --> 00:30:17,580
magazine excuse me first congratulations

684
00:30:21,680 --> 00:30:20,009
to all of you my question is also for

685
00:30:23,989 --> 00:30:21,690
Pete wonder if you could describe the

686
00:30:26,450 --> 00:30:23,999
first few days of the operations you'll

687
00:30:28,129 --> 00:30:26,460
be doing when can we expect the first

688
00:30:31,129 --> 00:30:28,139

pictures and one would be the first

689
00:30:32,749 --> 00:30:31,139
motion of the rover we're actually going

690
00:30:34,729 --> 00:30:32,759
through a lot of activity right now to

691
00:30:37,430 --> 00:30:34,739
talk about the characterization of the

692
00:30:40,310 --> 00:30:37,440
of the phase of the mission when we

693
00:30:41,899 --> 00:30:40,320
first land will want to ascertain the

694
00:30:44,269 --> 00:30:41,909
integrity of the vehicle since we will

695
00:30:47,210 --> 00:30:44,279
not have seen it in that state for

696
00:30:49,369 --> 00:30:47,220
almost a year and will want to ascertain

697
00:30:52,789 --> 00:30:49,379
the stability of where it is located and

698
00:30:54,859 --> 00:30:52,799
and and what kind of surrounding terrain

699
00:30:58,460 --> 00:30:54,869
we have and so we'll go through that at

700
00:31:01,450 --> 00:30:58,470
that that health assessment then we will

701
00:31:04,430 --> 00:31:01,460
engage in a set of first time activities

702
00:31:06,710 --> 00:31:04,440
clearly we'll get pictures from the mast

703
00:31:10,180 --> 00:31:06,720
we would expect the the day after

704
00:31:12,859 --> 00:31:10,190
landing we will I think at that point

705
00:31:14,719 --> 00:31:12,869
shortly thereafter try to exercise the

706
00:31:17,389 --> 00:31:14,729
arm and its motion but not certainly in

707
00:31:20,960 --> 00:31:17,399
sample acquisition I expect us to drive

708
00:31:23,149 --> 00:31:20,970
in inside the first week if nothing else

709
00:31:24,320 --> 00:31:23,159
to get away from the landing zone where

710
00:31:27,769 --> 00:31:24,330
the where there might have been

711
00:31:29,570 --> 00:31:27,779
contamination from the engines after

712
00:31:33,169 --> 00:31:29,580
that it will depend very much on the

713
00:31:36,589 --> 00:31:33,179

state which we see things and and also

714
00:31:38,119 --> 00:31:36,599
the science targets we could land very

715
00:31:39,649 --> 00:31:38,129
close to something attractive we could

716
00:31:41,479 --> 00:31:39,659
land quite distant from something

717
00:31:42,469 --> 00:31:41,489
attractive we would have to decide you

718
00:31:44,419 --> 00:31:42,479
know that would be the facts on the

719
00:31:47,479 --> 00:31:44,429
ground news we would see it I would not

720
00:31:49,310 --> 00:31:47,489
expect this to take a sample and trying

721
00:31:51,710 --> 00:31:49,320
to adjust it into Sam and chemin for

722
00:31:53,859 --> 00:31:51,720
quite some time possibly as long as two

723
00:31:56,359 --> 00:31:53,869
or three months after we actually land

724
00:31:58,879 --> 00:31:56,369
but the other science instruments will

725
00:32:01,039 --> 00:31:58,889
start right away things like the red and

726
00:32:03,799 --> 00:32:01,049
the end the Dan which which measures

727
00:32:05,239 --> 00:32:03,809
subsurface hydrogen those are passive

728
00:32:07,489 --> 00:32:05,249
instruments i would expect us to start

729
00:32:09,619 --> 00:32:07,499
those investigations right away so it'll

730
00:32:12,889 --> 00:32:09,629
be a mixed bag in terms of when the

731
00:32:15,080 --> 00:32:12,899
science comes out comes out bill bill

732
00:32:16,430 --> 00:32:15,090
horn with CBS news too quick which is

733
00:32:19,339 --> 00:32:16,440
sort of related i think there for Pete

734
00:32:21,720 --> 00:32:19,349
although he might jump into first is a

735
00:32:23,670 --> 00:32:21,730
simple reporter question we've all been

736
00:32:25,550 --> 00:32:23,680
this is the most complex Lander had ever

737
00:32:28,500 --> 00:32:25,560
said to another planet and I'm wondering

738
00:32:29,520 --> 00:32:28,510

you guys include apollo lunar landers in

739
00:32:30,930 --> 00:32:29,530
that I mean I'm do I need to put the

740
00:32:32,580 --> 00:32:30,940
word robotic in front of that when I

741
00:32:40,500 --> 00:32:32,590
think this is the most complex mission

742
00:32:43,200 --> 00:32:40,510
ever since I would if I were you then

743
00:32:44,490 --> 00:32:43,210
the related question is the risk-benefit

744
00:32:46,080 --> 00:32:44,500
on this mission I mean everybody sees

745
00:32:49,020 --> 00:32:46,090
that landing sequence into the unsigned

746
00:32:51,000 --> 00:32:49,030
I you know it just looks crazy and I

747
00:32:52,800 --> 00:32:51,010
realize you guys think that this is this

748
00:32:55,200 --> 00:32:52,810
is great and it's the next that's a

749
00:32:56,190 --> 00:32:55,210
great way to do this and you know it

750
00:32:57,510 --> 00:32:56,200
just it just seems like there's a

751
00:32:59,100 --> 00:32:57,520
there's a big risk with a mission like

752
00:33:00,570 --> 00:32:59,110
this and there's a huge payoff with the

753
00:33:02,160 --> 00:33:00,580
mission like this there's both of them

754
00:33:06,660 --> 00:33:02,170
at once I mean how do you characterize

755
00:33:09,500 --> 00:33:06,670
that the risk and the benefit well I

756
00:33:12,120 --> 00:33:09,510
think the characterization of the

757
00:33:13,980 --> 00:33:12,130
benefit versus the investment that the

758
00:33:15,900 --> 00:33:13,990
agency wants to make is what you know

759
00:33:18,840 --> 00:33:15,910
choline can speak to and the agency can

760
00:33:20,790 --> 00:33:18,850
speak to you know my job is to make the

761
00:33:22,920 --> 00:33:20,800
risk as small as I can possibly make it

762
00:33:25,530 --> 00:33:22,930
given that that's the job we've been

763
00:33:28,170 --> 00:33:25,540

asked to do and to tell them if we think

764
00:33:31,050 --> 00:33:28,180
that that risk is unacceptably high okay

765
00:33:32,550 --> 00:33:31,060
I think that we have done of the same

766
00:33:34,890 --> 00:33:32,560
kind of due diligence on this mission

767
00:33:37,140 --> 00:33:34,900
that we did on on ma are and we do on on

768
00:33:39,420 --> 00:33:37,150
all our space missions I you know we've

769
00:33:41,760 --> 00:33:39,430
done all the testing that we thought we

770
00:33:44,610 --> 00:33:41,770
needed to do we've done all the analysis

771
00:33:46,470 --> 00:33:44,620
the your impression of the sky crane is

772
00:33:48,210 --> 00:33:46,480
not alone there are a lot of people who

773
00:33:50,820 --> 00:33:48,220
look at that and say you know what are

774
00:33:52,560 --> 00:33:50,830
you thinking and and we have done a

775
00:33:54,830 --> 00:33:52,570
tremendous amount of review and analysis

776
00:33:57,090 --> 00:33:54,840
and independent review of that of that

777
00:33:58,230 --> 00:33:57,100
approach from the very beginning one of

778
00:34:00,930 --> 00:33:58,240
the first questions we asked ourselves

779
00:34:03,930 --> 00:34:00,940
was how we're going to test this okay

780
00:34:05,280 --> 00:34:03,940
and we we went outside of NASA and into

781
00:34:06,600 --> 00:34:05,290
a whole bunch of other people to do this

782
00:34:08,370 --> 00:34:06,610
kind of work to try and get that

783
00:34:10,050 --> 00:34:08,380
ascertained and that was successfully I

784
00:34:11,970 --> 00:34:10,060
mean we put two cellular test program

785
00:34:13,500 --> 00:34:11,980
that we feel is will be you know had

786
00:34:16,050 --> 00:34:13,510
successfully validated that from a

787
00:34:19,710 --> 00:34:16,060
design standpoint it will work you know

788
00:34:21,630 --> 00:34:19,720

from a from a you know we're doing 50

789
00:34:23,340 --> 00:34:21,640
plus pyro events and we're doing a lot

790
00:34:24,720 --> 00:34:23,350
of things so from the standpoint that if

791
00:34:26,730 --> 00:34:24,730
something breaks decides to break at

792
00:34:28,410 --> 00:34:26,740
that point in time you know we're in

793
00:34:31,350 --> 00:34:28,420
trouble but you know we've done

794
00:34:32,760 --> 00:34:31,360
everything we can think of to do yes

795
00:34:34,800 --> 00:34:32,770
this is the most complicated mission

796
00:34:38,360 --> 00:34:34,810
we've attempted on the surface of

797
00:34:42,240 --> 00:34:38,370
Mars the science kind of demands that

798
00:34:43,830 --> 00:34:42,250
this kind of sampling science and the

799
00:34:46,110 --> 00:34:43,840
science that we want to obtain has

800
00:34:47,820 --> 00:34:46,120
required sophisticated sampling

801
00:34:49,470 --> 00:34:47,830
mechanisms has required a long life

802
00:34:51,510 --> 00:34:49,480
Rover has required a long Traverse

803
00:34:53,490 --> 00:34:51,520
distance has required a large Rover and

804
00:34:55,050 --> 00:34:53,500
that's required a complicated entry

805
00:34:57,540 --> 00:34:55,060
descent landing system and so that whole

806
00:35:01,020 --> 00:34:57,550
string kind of goes together now if

807
00:35:05,010 --> 00:35:01,030
Colleen was to talk about the benefit

808
00:35:07,110 --> 00:35:05,020
versus investments bill I think one

809
00:35:09,810 --> 00:35:07,120
thing the agency looks at is the is the

810
00:35:11,820 --> 00:35:09,820
path that we have going forward and so

811
00:35:14,700 --> 00:35:11,830
first off this is the most interesting

812
00:35:17,760 --> 00:35:14,710
science we could possibly do and then

813
00:35:19,830 --> 00:35:17,770

how it converges with other missions

814
00:35:23,520 --> 00:35:19,840
that NASA's trying to undertake and

815
00:35:25,890 --> 00:35:23,530
because we can after this have a have a

816
00:35:28,290 --> 00:35:25,900
vehicle that we can land safely on the

817
00:35:31,020 --> 00:35:28,300
surface of another body that's 900

818
00:35:33,420 --> 00:35:31,030
kilograms that we really can't do any

819
00:35:35,490 --> 00:35:33,430
other way then that's part of the risk

820
00:35:38,310 --> 00:35:35,500
that we think is worth it and then as

821
00:35:41,430 --> 00:35:38,320
Pete said we have an enormous amount of

822
00:35:44,190 --> 00:35:41,440
risk reviews where we look both

823
00:35:46,350 --> 00:35:44,200
internally and externally at any kind of

824
00:35:48,750 --> 00:35:46,360
mitigation we can do we look at what's

825
00:35:50,760 --> 00:35:48,760
called residual risks and we look then

826
00:35:53,820 --> 00:35:50,770
at the hundred thousand foot picture and

827
00:35:57,810 --> 00:35:53,830
say if you will yeah for this I'm and

828
00:36:00,300 --> 00:35:57,820
say you know is this really a good bet

829
00:36:02,700 --> 00:36:00,310
that it'll work and we did each of those

830
00:36:04,470 --> 00:36:02,710
on the Mars Science Lab we said yes to

831
00:36:08,070 --> 00:36:04,480
each of those and that's what's brought

832
00:36:09,960 --> 00:36:08,080
us here today Justin Justin right with

833
00:36:11,430 --> 00:36:09,970
spaceflight now calm also for peta's

834
00:36:13,230 --> 00:36:11,440
wondering if you could talk to us a

835
00:36:14,790 --> 00:36:13,240
little bit about the communications plan

836
00:36:16,680 --> 00:36:14,800
during entry and descent and landing

837
00:36:20,040 --> 00:36:16,690
what you will actually be knowing in

838
00:36:22,170 --> 00:36:20,050

real time during during entry well I

839
00:36:23,880 --> 00:36:22,180
think we're we're in you know much

840
00:36:25,050 --> 00:36:23,890
better shape than we were with em er and

841
00:36:27,540 --> 00:36:25,060
we're in the kind of same kind of shape

842
00:36:31,710 --> 00:36:27,550
we were with Phoenix so we are we will

843
00:36:32,970 --> 00:36:31,720
have over flights of the landing area by

844
00:36:35,570 --> 00:36:32,980
both odyssey and mars reconnaissance

845
00:36:38,550 --> 00:36:35,580
orbiter and we will have a UHF

846
00:36:43,440 --> 00:36:38,560
communication at high rate from those

847
00:36:46,500 --> 00:36:43,450
assets from from from the MSL spacecraft

848
00:36:47,870 --> 00:36:46,510
and curiosity to those assets from the

849
00:36:50,720 --> 00:36:47,880
start of entry descent landing all the

850
00:36:53,269 --> 00:36:50,730
the ground there is a second overflight

851
00:36:55,910 --> 00:36:53,279
I believe of Odyssey about an hour later

852
00:36:58,039 --> 00:36:55,920
and so we'll be able to get a short

853
00:37:00,680 --> 00:36:58,049
amount of data on a health check basis

854
00:37:04,009 --> 00:37:00,690
at that point in time as well we have X

855
00:37:06,259 --> 00:37:04,019
band tones if you remember ma are we we

856
00:37:09,230 --> 00:37:06,269
use the subcarrier frequency to set toes

857
00:37:11,089 --> 00:37:09,240
to the ground on X band because that the

858
00:37:13,579 --> 00:37:11,099
earth is actually set at our landing

859
00:37:15,170 --> 00:37:13,589
site by the time we get there we won't

860
00:37:17,870 --> 00:37:15,180
get tones to the ground but we will get

861
00:37:19,819 --> 00:37:17,880
tones through parachute deploy so we've

862
00:37:22,730 --> 00:37:19,829
got very good communication coverage for

863
00:37:27,019 --> 00:37:22,740

the entry descent and landing event the

864
00:37:28,759 --> 00:37:27,029
the the Odyssey relay will be a bent

865
00:37:30,980 --> 00:37:28,769
pipe so we'll get that in real time the

866
00:37:33,319 --> 00:37:30,990
MRO relay is a store and forward so that

867
00:37:37,220 --> 00:37:33,329
will be played back immediately after

868
00:37:39,589 --> 00:37:37,230
the landing oh yeah hi mike wall from

869
00:37:40,849 --> 00:37:39,599
space com um yeah like this has been a

870
00:37:42,769 --> 00:37:40,859
long time coming obviously you guys

871
00:37:44,630 --> 00:37:42,779
started working on this and yeah about

872
00:37:46,430 --> 00:37:44,640
2003 and I mean you had a two-year

873
00:37:48,109 --> 00:37:46,440
launch slept back in 2009 I mean I was

874
00:37:49,819 --> 00:37:48,119
just wondering if you could just kind of

875
00:37:51,529 --> 00:37:49,829
say what does it feel like now to just

876
00:37:53,539 --> 00:37:51,539
just be a few days away from launch

877
00:37:54,980 --> 00:37:53,549
after this extremely long and involved

878
00:37:56,329 --> 00:37:54,990
process how does it feel seeing up there

879
00:38:02,150 --> 00:37:56,339
talking about this is actually going to

880
00:38:03,470 --> 00:38:02,160
happen in a few days well I think you

881
00:38:06,140 --> 00:38:03,480
know it feels tremendous to have

882
00:38:08,569 --> 00:38:06,150
completed all this work and to have and

883
00:38:10,700 --> 00:38:08,579
to have the risk situation being what we

884
00:38:13,190 --> 00:38:10,710
think is in is in very good shape for

885
00:38:14,990 --> 00:38:13,200
this kind of thing not perfect obviously

886
00:38:18,769 --> 00:38:15,000
there is major risk to these things but

887
00:38:20,980 --> 00:38:18,779
but we're in pretty good shape I think

888
00:38:23,180 --> 00:38:20,990

if you ask into its individual person

889
00:38:24,920 --> 00:38:23,190
they'll provide a slightly different

890
00:38:31,009 --> 00:38:24,930
answer depending on how finished they

891
00:38:32,359 --> 00:38:31,019
think they are you know with me I you

892
00:38:33,980 --> 00:38:32,369
know I wait for the range to tell me

893
00:38:35,539 --> 00:38:33,990
it's green about a minute before we go

894
00:38:38,509 --> 00:38:35,549
before I finally decide that we're

895
00:38:40,370 --> 00:38:38,519
really going to do this today the the

896
00:38:41,900 --> 00:38:40,380
people who are worried about landing and

897
00:38:44,870 --> 00:38:41,910
and worried about the surface mission

898
00:38:46,609 --> 00:38:44,880
they consider this prologue okay this is

899
00:38:47,930 --> 00:38:46,619
necessary but not sufficient for them to

900
00:38:49,339 --> 00:38:47,940
get their jobs done and they've got a

901
00:38:52,220 --> 00:38:49,349
lot of work to do during the cruise to

902
00:38:57,140 --> 00:38:52,230
get ready for that but I think you could

903
00:38:59,599 --> 00:38:57,150
visibly see the team morale improve the

904
00:39:01,309 --> 00:38:59,609
team grin more the team smile more as

905
00:39:03,620 --> 00:39:01,319
the rover

906
00:39:06,049 --> 00:39:03,630
and the vehicle came closer and more and

907
00:39:09,380 --> 00:39:06,059
more together here when we were at the

908
00:39:11,180 --> 00:39:09,390
Kennedy I mean every time Dave Ruel are

909
00:39:13,729 --> 00:39:11,190
at low manager would send a string of

910
00:39:15,019 --> 00:39:13,739
pictures back to pasadena and we saw you

911
00:39:16,789 --> 00:39:15,029
know more and more of the vehicle being

912
00:39:19,640 --> 00:39:16,799
put together every time we saw a picture

913
00:39:21,259 --> 00:39:19,650

of pad 41 and we saw you know the Atlas

914
00:39:22,640 --> 00:39:21,269
being built you know you feel like yeah

915
00:39:24,589 --> 00:39:22,650
it's really here we're really going to

916
00:39:26,329 --> 00:39:24,599
do it this time we're ready to go so

917
00:39:30,170 --> 00:39:26,339
yeah there are a lot of grins around

918
00:39:32,930 --> 00:39:30,180
that's for sure Craig Craig gevalt with

919
00:39:35,209 --> 00:39:32,940
aerospace America first a question for

920
00:39:42,880 --> 00:39:35,219
the launcher guys and then a question

921
00:39:46,699 --> 00:39:42,890
for Pete I guess it's Omar in and burn

922
00:39:51,069 --> 00:39:46,709
some launchers are so important that

923
00:39:54,199 --> 00:39:51,079
well in their parts selection there's a

924
00:39:58,339 --> 00:39:54,209
extra effort to pick components that

925
00:40:02,739 --> 00:39:58,349
have the very highest test results as

926
00:40:09,170 --> 00:40:02,749
all the component testing goes on is

927
00:40:15,499 --> 00:40:09,180
that a process that was used with MSL

928
00:40:20,509 --> 00:40:15,509
launcher or is it the basic standard

929
00:40:23,299 --> 00:40:20,519
components for ms LS Atlas 5 the answer

930
00:40:26,299 --> 00:40:23,309
is that on this vehicle we have our our

931
00:40:29,049 --> 00:40:26,309
standard criteria that components have

932
00:40:31,939 --> 00:40:29,059
to pass to be qualified for flight and

933
00:40:34,489 --> 00:40:31,949
that's okay because that standard is

934
00:40:38,599 --> 00:40:34,499
extremely high you're absolutely right

935
00:40:40,670 --> 00:40:38,609
this is a critical important launch one

936
00:40:43,370 --> 00:40:40,680
of the ways that we stay successful is

937
00:40:45,069 --> 00:40:43,380
we treat every mission like that I don't

938
00:40:48,289 --> 00:40:45,079

want that to sound like kind of a

939
00:40:50,029 --> 00:40:48,299
flippant answer we really do treat it

940
00:40:53,779 --> 00:40:50,039
like that if there is a component that

941
00:40:56,269 --> 00:40:53,789
is suspect or doesn't pass the screening

942
00:40:57,969 --> 00:40:56,279
or test criteria on any of our missions

943
00:41:00,109 --> 00:40:57,979
whether it's somebody's 30th

944
00:41:02,749 --> 00:41:00,119
communications satellite or a critical

945
00:41:05,670 --> 00:41:02,759
one of a kind mission like this it's not

946
00:41:08,309 --> 00:41:05,680
going to get on on that rocket and

947
00:41:10,799 --> 00:41:08,319
that's uh that's that's a standard that

948
00:41:13,319 --> 00:41:10,809
we set for ourselves our NASA customer

949
00:41:16,500 --> 00:41:13,329
works with us to make sure that that

950
00:41:19,650 --> 00:41:16,510
standard is enforced so the basic answer

951
00:41:21,270 --> 00:41:19,660
is there wasn't anything unique done for

952
00:41:22,680 --> 00:41:21,280
this mission because we already have the

953
00:41:27,030 --> 00:41:22,690
high standards in place it takes to be

954
00:41:29,670 --> 00:41:27,040
successful Jay and for Pete when you and

955
00:41:34,799 --> 00:41:29,680
I last visited at JPL about 18 months

956
00:41:39,630 --> 00:41:34,809
ago you said experience in building the

957
00:41:42,599 --> 00:41:39,640
rover so far to that to that time show

958
00:41:49,290 --> 00:41:42,609
serious problems in the US aerospace

959
00:41:51,809 --> 00:41:49,300
parts fabrication sector if you will can

960
00:41:55,859 --> 00:41:51,819
you expand upon that now that the

961
00:41:58,280 --> 00:41:55,869
assembly all that parts of selections

962
00:42:02,359 --> 00:41:58,290
are complete and you're here on the pad

963
00:42:05,160 --> 00:42:02,369

explain further what you meant by that

964
00:42:07,290 --> 00:42:05,170
yeah I think that first of all this is

965
00:42:09,620 --> 00:42:07,300
page point of view okay this is not

966
00:42:14,700 --> 00:42:09,630
necessarily Nassau or JPL point of view

967
00:42:17,250 --> 00:42:14,710
but I feel that that we've had quality

968
00:42:21,420 --> 00:42:17,260
incidents through the building of the

969
00:42:23,339 --> 00:42:21,430
rover in larger numbers than we've had

970
00:42:24,690 --> 00:42:23,349
in the past when I was a much younger

971
00:42:28,079 --> 00:42:24,700
engineer building these kinds of

972
00:42:30,720 --> 00:42:28,089
equipment and I think I think the result

973
00:42:34,319 --> 00:42:30,730
of that has been stress on our schedules

974
00:42:36,839 --> 00:42:34,329
in our in our in our and our funding I

975
00:42:40,799 --> 00:42:36,849
don't think that that has resulted in a

976
00:42:42,450 --> 00:42:40,809
less adequate product I think that Vern

977
00:42:44,039 --> 00:42:42,460
is absolutely correct we have quality

978
00:42:45,539 --> 00:42:44,049
standards and mission assurance plans

979
00:42:47,970 --> 00:42:45,549
that we put in place and we and we

980
00:42:50,010 --> 00:42:47,980
follow those very rigorously and we do

981
00:42:51,599 --> 00:42:50,020
not deviate those from those we may

982
00:42:53,190 --> 00:42:51,609
detect problems that we then have to go

983
00:42:54,539 --> 00:42:53,200
off and solve as a result of those

984
00:42:58,109 --> 00:42:54,549
things but that does not mean that we

985
00:42:59,760 --> 00:42:58,119
accept a quality shortfall as a result

986
00:43:02,190 --> 00:42:59,770
of whatever issues we kind of come up

987
00:43:04,170 --> 00:43:02,200
with you know we we had problems with

988
00:43:05,970 --> 00:43:04,180

the actuators we solve those we've had

989
00:43:08,640 --> 00:43:05,980
problems with other piece parts we've

990
00:43:10,559 --> 00:43:08,650
solved those I'm very very happy with

991
00:43:14,010 --> 00:43:10,569
the quality that's uh that's in the in

992
00:43:15,780 --> 00:43:14,020
the rover I think that you know in terms

993
00:43:18,160 --> 00:43:15,790
of the number of pollen failure reports

994
00:43:19,900 --> 00:43:18,170
and the number of waivers we've signed

995
00:43:23,110 --> 00:43:19,910
we have no waivers with descent on this

996
00:43:24,850 --> 00:43:23,120
vehicle and the number of red flag PFR

997
00:43:26,650 --> 00:43:24,860
is unverified Phil years we're very much

998
00:43:28,000 --> 00:43:26,660
in family with where we were on Cassini

999
00:43:30,700 --> 00:43:28,010
and we're very much in family with where

1000
00:43:33,310 --> 00:43:30,710
we were on Mars Exploration Rover so i

1001
00:43:35,080 --> 00:43:33,320
think it's a it's a my point of view

1002
00:43:36,790 --> 00:43:35,090
it's a it's a tougher road to hoe a

1003
00:43:38,080 --> 00:43:36,800
little bit to get to there but the

1004
00:43:41,260 --> 00:43:38,090
qualities our product when you get there

1005
00:43:42,790 --> 00:43:41,270
is is as it's been in the past Jay I'm

1006
00:43:48,610 --> 00:43:42,800
sorry Fred we're running short of time

1007
00:43:52,780 --> 00:43:48,620
we had a jay jay barberry with NBC yeah

1008
00:43:55,630 --> 00:43:52,790
what what is the average temperature in

1009
00:43:58,680 --> 00:43:55,640
Fahrenheit at Gale Crater when curiosity

1010
00:44:01,840 --> 00:43:58,690
will be operating and what is the

1011
00:44:05,440 --> 00:44:01,850
temperature range on Mars the latest

1012
00:44:09,160 --> 00:44:05,450
that you have in Fahrenheit can you tell

1013
00:44:14,440 --> 00:44:09,170

me that I'm sorry on the Senate great

1014
00:44:17,040 --> 00:44:14,450
guy I i I'm Fahrenheit on earth but I'm

1015
00:44:20,320 --> 00:44:17,050
centigrade on Mars so somebody will

1016
00:44:23,650 --> 00:44:20,330
still to celsus could you tell me what

1017
00:44:26,440 --> 00:44:23,660
will be the range that curiosity will be

1018
00:44:27,910 --> 00:44:26,450
working in and Gale Crater ok the the

1019
00:44:29,770 --> 00:44:27,920
cold temperatures at night can get down

1020
00:44:33,480 --> 00:44:29,780
below about a minus 100 degree

1021
00:44:37,870 --> 00:44:33,490
centigrade minus 100 degrees centigrade

1022
00:44:41,020 --> 00:44:37,880
centigrade ok I ok the radical converted

1023
00:44:44,800 --> 00:44:41,030
yeah you've got to go convert it the the

1024
00:44:46,510 --> 00:44:44,810
will be able to operate the rover we

1025
00:44:48,100 --> 00:44:46,520
need to heat up the actuators in order

1026
00:44:49,570 --> 00:44:48,110
to move and do mobility and we'll be

1027
00:44:51,600 --> 00:44:49,580
able to start doing that when it's about

1028
00:44:55,390 --> 00:44:51,610
minus 60 or minus 50 degrees centigrade

1029
00:44:59,560 --> 00:44:55,400
ok 50 or 60 during the day it gets up to

1030
00:45:01,870 --> 00:44:59,570
0 minus 10 0 plus 10 plus 20 depending

1031
00:45:07,930 --> 00:45:01,880
upon the season and a variety of other

1032
00:45:11,590 --> 00:45:07,940
factors ok thank you alverson in florida

1033
00:45:15,700 --> 00:45:11,600
today one poor Joel and I guess one for

1034
00:45:18,550 --> 00:45:15,710
Omar Joe I was wondering about the

1035
00:45:21,940 --> 00:45:18,560
onshore flow that you anticipate seeing

1036
00:45:25,510 --> 00:45:21,950
in your your weather criteria for toxics

1037
00:45:28,870 --> 00:45:25,520
and the potential for you know plume to

1038
00:45:30,230 --> 00:45:28,880

might blow over you know surrounding our

1039
00:45:33,200 --> 00:45:30,240
community and

1040
00:45:37,370 --> 00:45:33,210
I was wondering if you do anything

1041
00:45:40,220 --> 00:45:37,380
different with an RTG on board are there

1042
00:45:43,460 --> 00:45:40,230
any special weather criteria for rtgs

1043
00:45:46,190 --> 00:45:43,470
and for Omar I was wondering if you

1044
00:45:49,040 --> 00:45:46,200
could explain the windows are the launch

1045
00:45:51,770 --> 00:45:49,050
opportunities within the window if you

1046
00:45:54,560 --> 00:45:51,780
don't get off at no.2 how your

1047
00:45:57,740 --> 00:45:54,570
opportunities fallout from that time to

1048
00:45:59,870 --> 00:45:57,750
the end of the window thanks I'll go

1049
00:46:01,760 --> 00:45:59,880
first as far as the wind flow yes it's

1050
00:46:04,550 --> 00:46:01,770
pretty much going to be due east to west

1051
00:46:06,410 --> 00:46:04,560
on that day a hundred degrees to my

1052
00:46:09,200 --> 00:46:06,420
knowledge there's not anything different

1053
00:46:12,820 --> 00:46:09,210
the what we call the risk assessment

1054
00:46:15,109 --> 00:46:12,830
center does as far as a potential plume

1055
00:46:17,600 --> 00:46:15,119
but again they take the real-time

1056
00:46:19,400 --> 00:46:17,610
weather data from the balloons that we

1057
00:46:22,220 --> 00:46:19,410
released during a countdown the lowest

1058
00:46:24,230 --> 00:46:22,230
few thousand feet and they will adjust

1059
00:46:26,290 --> 00:46:24,240
their model accordingly based on the

1060
00:46:29,510 --> 00:46:26,300
wind flow and they look at short-term

1061
00:46:32,060 --> 00:46:29,520
wind flow projections to see if any

1062
00:46:35,210 --> 00:46:32,070
changes are expected but other than that

1063
00:46:36,320 --> 00:46:35,220

I don't again correct me if I'm wrong up

1064
00:46:38,900 --> 00:46:36,330
on the panel but I don't believe there's

1065
00:46:42,320 --> 00:46:38,910
anything in addition plume why's that

1066
00:46:46,400 --> 00:46:42,330
they they'll do just because of the RTG

1067
00:46:48,950 --> 00:46:46,410
on board what time do you come no go

1068
00:46:53,180 --> 00:46:48,960
because of the potential for toxic so

1069
00:46:55,010 --> 00:46:53,190
what's the cut out there I believe it

1070
00:46:57,050 --> 00:46:55,020
all depends on one that balloon releases

1071
00:46:59,720 --> 00:46:57,060
i'm not sure the exact time and how late

1072
00:47:01,970 --> 00:46:59,730
an account but whenever after we release

1073
00:47:05,150 --> 00:47:01,980
a balloon they will get the data and

1074
00:47:07,280 --> 00:47:05,160
then their motto will project what the

1075
00:47:09,320 --> 00:47:07,290
plume would do and if it violates their

1076
00:47:11,990 --> 00:47:09,330
criteria then they would go you know

1077
00:47:13,520 --> 00:47:12,000
no-go it I don't believe it depends it

1078
00:47:16,550 --> 00:47:13,530
matters at what time the account that

1079
00:47:19,609 --> 00:47:16,560
occurs again it's going to be basically

1080
00:47:23,720 --> 00:47:19,619
after each balloon is released okay you

1081
00:47:27,080 --> 00:47:23,730
had a question for Omar yeah yeah as far

1082
00:47:29,420 --> 00:47:27,090
as launch window management what we have

1083
00:47:32,900 --> 00:47:29,430
done is we've analyzed five-minute

1084
00:47:36,050 --> 00:47:32,910
segments so every five minutes we have

1085
00:47:37,820 --> 00:47:36,060
an opportunity we do have a limitation

1086
00:47:40,910 --> 00:47:37,830
because the spacecraft does have some

1087
00:47:42,050 --> 00:47:40,920
onboard timers that have to be reset so

1088
00:47:47,110 --> 00:47:42,060

we need

1089
00:47:50,450 --> 00:47:47,120
about 14 minutes between opportunities

1090
00:47:54,460 --> 00:47:50,460
to be able to have the spacecraft

1091
00:47:56,810 --> 00:47:54,470
reconfigure get back on external power

1092
00:47:59,570 --> 00:47:56,820
set their timers and get back on

1093
00:48:02,290 --> 00:47:59,580
internal power so we've analyzed every

1094
00:48:04,880 --> 00:48:02,300
five minutes throughout that window and

1095
00:48:09,820 --> 00:48:04,890
do have some lag time depending on how

1096
00:48:11,900 --> 00:48:09,830
deep we get inside of t minus 11 minutes

1097
00:48:15,170 --> 00:48:11,910
right right here this would be the last

1098
00:48:18,710 --> 00:48:15,180
one g michalka with talking space this

1099
00:48:21,260 --> 00:48:18,720
might be for Colleen article this week

1100
00:48:24,590 --> 00:48:21,270
said this might be the last of the

1101
00:48:26,540 --> 00:48:24,600
larger deep-space exploration missions

1102
00:48:28,670 --> 00:48:26,550
because of the blutonium 238 issue

1103
00:48:31,550 --> 00:48:28,680
meaning you know with the fuel shortage

1104
00:48:33,830 --> 00:48:31,560
we really you know how bad is it are we

1105
00:48:36,170 --> 00:48:33,840
really at a crossroads here with a

1106
00:48:39,340 --> 00:48:36,180
different power source or are we looking

1107
00:48:41,720 --> 00:48:39,350
at alter alternate power sources if the

1108
00:48:44,320 --> 00:48:41,730
production of plutonium-238 isn't

1109
00:48:46,880 --> 00:48:44,330
approved well the the natural decay of

1110
00:48:49,460 --> 00:48:46,890
plutonium-238 is certainly a preferred

1111
00:48:52,240 --> 00:48:49,470
one of the preferred ways of going and

1112
00:48:55,190 --> 00:48:52,250
the Congress is looking at providing

1113
00:48:58,940 --> 00:48:55,200

funding to start up for the Department

1114
00:49:01,990 --> 00:48:58,950
of Energy a new plutonium-238 line in

1115
00:49:04,790 --> 00:49:02,000
addition NASA for some time hasn't been

1116
00:49:07,910 --> 00:49:04,800
investigated investigating and investing

1117
00:49:10,910 --> 00:49:07,920
in alternative ways of doing some of

1118
00:49:14,720 --> 00:49:10,920
these missions and that includes ion

1119
00:49:16,490 --> 00:49:14,730
propulsion the dawn mission that i

1120
00:49:19,550 --> 00:49:16,500
mentioned that had gone to Vesta and

1121
00:49:22,370 --> 00:49:19,560
will then go on to series is I on

1122
00:49:24,920 --> 00:49:22,380
proposed that's a unique way of using

1123
00:49:27,290 --> 00:49:24,930
propulsion so we're looking at alternate

1124
00:49:29,630 --> 00:49:27,300
ways for power and propulsion but

1125
00:49:32,180 --> 00:49:29,640
certainly when you are doing something

1126
00:49:35,090 --> 00:49:32,190
like the Curiosity rover is doing and

1127
00:49:37,580 --> 00:49:35,100
trying to Rove on a planet day and night

1128
00:49:40,640 --> 00:49:37,590
and do a kind of intense investigation

1129
00:49:42,830 --> 00:49:40,650
it is the preferred way and we don't

1130
00:49:45,320 --> 00:49:42,840
predict at this stage that we'll have

1131
00:49:48,380 --> 00:49:45,330
any trouble making sure that the United

1132
00:49:51,770 --> 00:49:48,390
States and NASA has enough plutonium 238

1133
00:49:53,200 --> 00:49:51,780
so we're working it all right thank you

1134
00:49:54,490 --> 00:49:53,210
kool aid and

1135
00:49:56,380 --> 00:49:54,500
going to end the briefing here we have a

1136
00:49:58,450 --> 00:49:56,390
bit of a time constraint because we need

1137
00:49:59,800 --> 00:49:58,460
to turn the satellite around and send it

1138
00:50:01,780 --> 00:49:59,810

to Houston because we have another

1139
00:50:04,900 --> 00:50:01,790
briefing coming up right here at two

1140
00:50:06,880 --> 00:50:04,910
o'clock one programming note as far as

1141
00:50:10,090 --> 00:50:06,890
launch coverage on launch day because of

1142
00:50:11,530 --> 00:50:10,100
the change in the launch time to 1002 we

1143
00:50:13,270 --> 00:50:11,540
will be starting coverage at

1144
00:50:14,890 --> 00:50:13,280
seven-thirty which is a half an hour

1145
00:50:18,010 --> 00:50:14,900
earlier than we had originally

1146
00:50:19,840 --> 00:50:18,020
advertised so we have our next briefing