Elon Musk
CEO and Chief Designer,
SpaceX, via Phone

1
00:00:11,509 --> 00:00:08,790
good afternoon and welcome to today's

2
00:00:13,749 --> 00:00:11,519
special spacex 3 post launch news

3
00:00:16,230 --> 00:00:13,759
conference after the launch of falcon 9

4
00:00:18,950 --> 00:00:16,240
and dragon we wanted to get together and

5
00:00:20,870 --> 00:00:18,960
and talk about how well the day went we

6
00:00:23,109 --> 00:00:20,880
are pleased today to be joined

7
00:00:25,109 --> 00:00:23,119
first by elon musk

8
00:00:27,269 --> 00:00:25,119
the chief executive officer and founder

9
00:00:29,990 --> 00:00:27,279
of spacex

10
00:00:31,669 --> 00:00:30,000
nasa's associate administrator for human

11
00:00:35,190 --> 00:00:31,679
exploration and operations mission

12
00:00:39,270 --> 00:00:37,110
and hans kunigsman

13
00:00:40,470 --> 00:00:39,280

the spacex vice president of mission

14
00:00:42,549 --> 00:00:40,480
assurance

15
00:00:45,029 --> 00:00:42,559
and we'll begin with opening remarks

16
00:00:45,990 --> 00:00:45,039
first we'll start in california with mr

17
00:00:47,910 --> 00:00:46,000
musk

18
00:00:48,869 --> 00:00:47,920
go ahead please

19
00:00:50,549 --> 00:00:48,879
sure

20
00:00:52,310 --> 00:00:50,559
so it looks like the

21
00:00:54,069 --> 00:00:52,320
everything looks great as far as the

22
00:00:55,430 --> 00:00:54,079
ascent phase of the mission

23
00:00:58,229 --> 00:00:55,440
and uh

24
00:01:00,389 --> 00:00:58,239
the so the rocket flight was um as

25
00:01:02,389 --> 00:01:00,399
perfect as far as we could tell

26
00:01:06,390 --> 00:01:02,399
and dragon deploy went well

27
00:01:11,510 --> 00:01:08,870
we had some some slight uh

28
00:01:13,590 --> 00:01:11,520
um initial challenges with with dragon

29
00:01:14,870 --> 00:01:13,600
but with respect to enabling some of the

30
00:01:17,190 --> 00:01:14,880
thruster quads but those have been

31
00:01:19,030 --> 00:01:17,200
resolved so looks like everything's good

32
00:01:21,510 --> 00:01:19,040
on on the dragon front

33
00:01:23,749 --> 00:01:21,520
uh for

34
00:01:25,910 --> 00:01:23,759
the rocket boost stage reentry

35
00:01:26,950 --> 00:01:25,920
we have good data

36
00:01:28,070 --> 00:01:26,960
down

37
00:01:33,510 --> 00:01:28,080
to

38
00:01:36,230 --> 00:01:33,520

mach 1.1 everything looks fine and we're

39
00:01:38,390 --> 00:01:36,240
awaiting additional data to see how the

40
00:01:40,789 --> 00:01:38,400
potential landing bone went but we have

41
00:01:42,550 --> 00:01:40,799
a it was a very heavy sea state

42
00:01:44,630 --> 00:01:42,560
condition so i would give i wouldn't

43
00:01:45,990 --> 00:01:44,640
give high odds that the

44
00:01:50,469 --> 00:01:46,000
rocket was able to splash down

45
00:01:55,030 --> 00:01:53,270
okay um mr gerstenmaier

46
00:01:57,350 --> 00:01:55,040
thanks mike again i'd like to

47
00:01:59,590 --> 00:01:57,360
congratulate the spacex team on a

48
00:02:01,350 --> 00:01:59,600
tremendous launch today

49
00:02:03,350 --> 00:02:01,360
they did a lot of great work last night

50
00:02:04,950 --> 00:02:03,360
getting ready to to get the rocket ready

51
00:02:06,630 --> 00:02:04,960
to go fly

52
00:02:08,389 --> 00:02:06,640
with the weather conditions it was kind

53
00:02:10,469 --> 00:02:08,399
of sporty for them to figure out exactly

54
00:02:12,470 --> 00:02:10,479
when the right time to load the vehicle

55
00:02:14,630 --> 00:02:12,480
and get it ready and keep options open

56
00:02:16,949 --> 00:02:14,640
and and they just did a tremendous job i

57
00:02:18,790 --> 00:02:16,959
would say the entire nasa payloads team

58
00:02:20,470 --> 00:02:18,800
as well as the spacex team did a

59
00:02:22,070 --> 00:02:20,480
tremendous job of getting ready to do

60
00:02:23,670 --> 00:02:22,080
the late load they did it early so then

61
00:02:25,350 --> 00:02:23,680
that allowed them the option of picking

62
00:02:26,869 --> 00:02:25,360
the right time to roll out with all the

63
00:02:29,030 --> 00:02:26,879

phase two lightning warnings that were

64
00:02:30,710 --> 00:02:29,040
coming and going throughout the night so

65
00:02:31,990 --> 00:02:30,720
thanks to their efforts we got a launch

66
00:02:33,509 --> 00:02:32,000
attempt today and the weather happened

67
00:02:35,509 --> 00:02:33,519
to be good at lunch time and we got a

68
00:02:37,750 --> 00:02:35,519
good launch so again congratulations to

69
00:02:39,509 --> 00:02:37,760
the spacex team for showing that can-do

70
00:02:41,750 --> 00:02:39,519
attitude and and going that extra mile

71
00:02:43,750 --> 00:02:41,760
to really work hard to get things ready

72
00:02:45,589 --> 00:02:43,760
on board space station we're ready uh

73
00:02:47,509 --> 00:02:45,599
for the dragon arrival that the crew

74
00:02:48,869 --> 00:02:47,519
actually reported and talked to mike a

75
00:02:50,390 --> 00:02:48,879
little bit and said they actually got to

76
00:02:52,150 --> 00:02:50,400
see the launch so that's pretty exciting

77
00:02:54,309 --> 00:02:52,160
when our crew gets to see the launch out

78
00:02:56,550 --> 00:02:54,319
of florida so that was encouraging

79
00:02:58,790 --> 00:02:56,560
the multiplexer onboard space station

80
00:03:00,869 --> 00:02:58,800
the repairs of that spare device are

81
00:03:02,630 --> 00:03:00,879
ready so we're ready for the eva next or

82
00:03:04,949 --> 00:03:02,640
the eva next week to go change that

83
00:03:06,869 --> 00:03:04,959
external mdm so we're looking forward to

84
00:03:08,390 --> 00:03:06,879
all the research coming up on dragon

85
00:03:10,149 --> 00:03:08,400
tremendous things we got to see nice

86
00:03:12,309 --> 00:03:10,159
video of the two payloads in the trunk

87
00:03:14,390 --> 00:03:12,319
got to see the h dev and the

88
00:03:15,830 --> 00:03:14,400

and the optical communication package in

89
00:03:18,070 --> 00:03:15,840
the trunk it's pretty cool seeing those

90
00:03:19,589 --> 00:03:18,080
on orbit seeing them in the trunk and

91
00:03:20,949 --> 00:03:19,599
it'll be really exciting to see them on

92
00:03:22,790 --> 00:03:20,959
station and actually operating and

93
00:03:24,229 --> 00:03:22,800
bringing data back to us so i look

94
00:03:25,830 --> 00:03:24,239
forward to all this research that's

95
00:03:28,149 --> 00:03:25,840
going on in station the crews are doing

96
00:03:29,750 --> 00:03:28,159
a great job things are going well and i

97
00:03:31,670 --> 00:03:29,760
really want to congratulate the spacex

98
00:03:33,589 --> 00:03:31,680
team for just a wonderful day today

99
00:03:35,190 --> 00:03:33,599
getting ready and keeping our show open

100
00:03:38,070 --> 00:03:35,200
options open they did really really

101
00:03:40,390 --> 00:03:38,080
great so thank you hans yeah um that

102
00:03:42,869 --> 00:03:40,400
both teams both here and at the cape and

103
00:03:44,630 --> 00:03:42,879
beckham hawthorne worked

104
00:03:46,630 --> 00:03:44,640
very hard over the last couple days to

105
00:03:48,630 --> 00:03:46,640
to get the vehicle ready and then last

106
00:03:51,350 --> 00:03:48,640
night of course we had uh we had to deal

107
00:03:53,509 --> 00:03:51,360
with weather mostly today um where there

108
00:03:54,550 --> 00:03:53,519
was our primary concern

109
00:03:56,789 --> 00:03:54,560
um

110
00:03:58,149 --> 00:03:56,799
everything worked very beautiful in the

111
00:04:01,110 --> 00:03:58,159
end uh

112
00:04:03,030 --> 00:04:01,120
we got we got a beautiful launch and uh

113
00:04:05,509 --> 00:04:03,040

we got some some really pretty video

114
00:04:07,350 --> 00:04:05,519
from from orbit it's uh it's really good

115
00:04:09,990 --> 00:04:07,360
day

116
00:04:12,550 --> 00:04:10,000
okay thank you we'll take questions now

117
00:04:14,070 --> 00:04:12,560
uh and uh because we have mr musk on the

118
00:04:15,910 --> 00:04:14,080
phone we want to make sure that you make

119
00:04:18,150 --> 00:04:15,920
sure that you address to whom your

120
00:04:19,909 --> 00:04:18,160
question goes please state your name and

121
00:04:22,790 --> 00:04:19,919
affiliation and wait for the microphone

122
00:04:24,629 --> 00:04:22,800
and let's start with marcia dunn

123
00:04:26,950 --> 00:04:24,639
marcia done associated press probably

124
00:04:28,870 --> 00:04:26,960
for mr musk

125
00:04:30,550 --> 00:04:28,880
sort of a light question um i'm

126
00:04:32,629 --> 00:04:30,560
wondering i know spacex has the

127
00:04:34,550 --> 00:04:32,639
tradition of putting uh surprises and

128
00:04:36,230 --> 00:04:34,560
gifts on board i'm wondering if there's

129
00:04:38,310 --> 00:04:36,240
anything in the way of chocolate easter

130
00:04:40,830 --> 00:04:38,320
eggs bunnies anything like that given

131
00:04:43,270 --> 00:04:40,840
that you'll be arriving on easter

132
00:04:45,430 --> 00:04:43,280
morning um

133
00:04:47,110 --> 00:04:45,440
i i you know i

134
00:04:48,950 --> 00:04:47,120
don't know of anything joe hunts do we

135
00:04:52,790 --> 00:04:48,960
have anything on on the

136
00:04:59,110 --> 00:04:56,230
nasa's uh our customer here so i mean we

137
00:05:01,909 --> 00:04:59,120
deferred it to nasa you know as to what

138
00:05:05,350 --> 00:05:01,919

cargo has manifested um

139
00:05:09,590 --> 00:05:05,360
so um yeah i i don't think we

140
00:05:12,790 --> 00:05:10,870
and i yeah know of anything it's a

141
00:05:16,469 --> 00:05:12,800
surprise and it'll be a surprise for all

142
00:05:18,710 --> 00:05:17,590
um

143
00:05:20,550 --> 00:05:18,720
we're we're a little too late in the

144
00:05:22,230 --> 00:05:20,560
launch so it won't i have not been

145
00:05:23,909 --> 00:05:22,240
briefed of anything uniquely that it's

146
00:05:25,590 --> 00:05:23,919
flying it but i wouldn't be surprised if

147
00:05:27,189 --> 00:05:25,600
there isn't something there but i don't

148
00:05:28,950 --> 00:05:27,199
know the details of what the teams may

149
00:05:30,790 --> 00:05:28,960
have loaded yeah

150
00:05:32,870 --> 00:05:30,800
we i know the scientific cargo i don't

151
00:05:34,550 --> 00:05:32,880
know the other person so i'm sorry

152
00:05:36,310 --> 00:05:34,560
nothing from spacex that you know of

153
00:05:39,029 --> 00:05:36,320
hans okay fine

154
00:05:41,590 --> 00:05:39,039
irene thanks um irene klotz uh with

155
00:05:43,110 --> 00:05:41,600
reuters for um ilan um when you said

156
00:05:44,310 --> 00:05:43,120
that uh you give high odds that the

157
00:05:46,790 --> 00:05:44,320
rocket was able to splash down

158
00:05:49,029 --> 00:05:46,800
successfully do you mean in one piece

159
00:05:51,590 --> 00:05:49,039
no sorry i i wasn't speaking clearly i

160
00:05:53,189 --> 00:05:51,600
said i wouldn't give high odds so

161
00:05:55,350 --> 00:05:53,199
um the

162
00:05:57,110 --> 00:05:55,360
i i mean i

163
00:06:00,230 --> 00:05:57,120

that the sea state is quite heavy i mean

164
00:06:02,150 --> 00:06:00,240
i heard reports of 15 to 20 foot uh wave

165
00:06:04,070 --> 00:06:02,160
height so it's really pretty pretty

166
00:06:05,430 --> 00:06:04,080
crazy out there in fact the boats

167
00:06:08,710 --> 00:06:05,440
weren't even able to get

168
00:06:10,309 --> 00:06:08,720
particularly close because of of the

169
00:06:11,990 --> 00:06:10,319
heavy seas

170
00:06:14,070 --> 00:06:12,000
so

171
00:06:16,790 --> 00:06:14,080
i think it's going to be it's unlikely

172
00:06:21,670 --> 00:06:16,800
that the rocket was able to

173
00:06:24,230 --> 00:06:21,680
splash down successfully but i think um

174
00:06:27,510 --> 00:06:24,240
we'll still get good data uh

175
00:06:28,950 --> 00:06:27,520
from uh the the plane telemetry

176
00:06:31,909 --> 00:06:28,960
and we should get that pretty soon as

177
00:06:33,430 --> 00:06:31,919
soon as we are able to

178
00:06:35,830 --> 00:06:33,440
look at that data we'll be able to

179
00:06:37,590 --> 00:06:35,840
provide some more information

180
00:06:40,469 --> 00:06:37,600
but i would consider it a success in the

181
00:06:43,990 --> 00:06:40,479
sense that we were able to control the

182
00:06:46,710 --> 00:06:44,000
boost stage to a zero zero roll rate

183
00:06:49,749 --> 00:06:46,720
which is previously what has destroyed

184
00:06:50,710 --> 00:06:49,759
the stages is an uncontrolled a role

185
00:06:52,870 --> 00:06:50,720
where the

186
00:06:54,230 --> 00:06:52,880
uh on-board uh nitrogen thrusters

187
00:06:56,390 --> 00:06:54,240
weren't able to

188
00:06:59,510 --> 00:06:56,400

overcome the aerodynamic torque and so

189
00:07:01,510 --> 00:06:59,520
sort of spun up um and this time with

190
00:07:03,510 --> 00:07:01,520
with more powerful thrusters

191
00:07:06,150 --> 00:07:03,520
and more um

192
00:07:07,830 --> 00:07:06,160
nitrogen propellant we were able to

193
00:07:10,629 --> 00:07:07,840
to null the roll rate so that's that's a

194
00:07:11,990 --> 00:07:10,639
good a bit of good news there

195
00:07:13,589 --> 00:07:12,000
and of course we

196
00:07:15,670 --> 00:07:13,599
were able to show that

197
00:07:18,070 --> 00:07:15,680
on ascent that the legs

198
00:07:20,550 --> 00:07:18,080
don't have any negative impact and that

199
00:07:22,790 --> 00:07:20,560
we're able to come back through

200
00:07:23,909 --> 00:07:22,800
uh through hypersonic velocity not we

201
00:07:25,430 --> 00:07:23,919
don't yet have the data through

202
00:07:27,510 --> 00:07:25,440
transonic but

203
00:07:30,469 --> 00:07:27,520
we have it through the the max

204
00:07:31,830 --> 00:07:30,479
dynamic um

205
00:07:34,309 --> 00:07:31,840
you know max dynamic four is coming

206
00:07:35,830 --> 00:07:34,319
through the mac what's called max q we

207
00:07:37,670 --> 00:07:35,840
have the information of the rocket

208
00:07:38,950 --> 00:07:37,680
making it through max q okay

209
00:07:43,510 --> 00:07:38,960
um

210
00:07:45,830 --> 00:07:43,520
to to find that out and it'll be

211
00:07:48,070 --> 00:07:45,840
awesome if as far as it gets that that

212
00:07:49,430 --> 00:07:48,080
that data will be able to use and

213
00:07:51,350 --> 00:07:49,440

uh

214
00:07:52,550 --> 00:07:51,360
flow back into into the

215
00:07:55,029 --> 00:07:52,560
next flight

216
00:07:57,350 --> 00:07:55,039
with an increased probability of a

217
00:07:58,390 --> 00:07:57,360
successful recovery

218
00:08:00,710 --> 00:07:58,400
so we're going to have to probably

219
00:08:02,309 --> 00:08:00,720
iterate our way our way there i think i

220
00:08:03,670 --> 00:08:02,319
should mention whether one of the sort

221
00:08:05,749 --> 00:08:03,680
of side point is

222
00:08:08,469 --> 00:08:05,759
that we did we did a

223
00:08:11,189 --> 00:08:08,479
longer coast and restart of the upper

224
00:08:12,710 --> 00:08:11,199
stage so this is a very sort of optional

225
00:08:15,270 --> 00:08:12,720
thing

226
00:08:18,550 --> 00:08:15,280
just to to see what our propelled

227
00:08:21,110 --> 00:08:18,560
residuals were and what the

228
00:08:23,749 --> 00:08:21,120
environments would be on the stage

229
00:08:25,670 --> 00:08:23,759
you know during a

230
00:08:27,670 --> 00:08:25,680
depletion shutdown

231
00:08:28,790 --> 00:08:27,680
and the upper stage coasted for about 35

232
00:08:31,670 --> 00:08:28,800
minutes

233
00:08:33,029 --> 00:08:31,680
and then restarted for a few seconds

234
00:08:35,750 --> 00:08:33,039
and went to

235
00:08:39,190 --> 00:08:35,760
to essentially zero liquid oxygen level

236
00:08:41,350 --> 00:08:39,200
with about 0.15 percent of propellant

237
00:08:42,949 --> 00:08:41,360
mass and fuel remaining which is very

238
00:08:45,269 --> 00:08:42,959

close to our target so

239
00:08:48,310 --> 00:08:45,279
that that's helpful for us to

240
00:08:52,230 --> 00:08:49,829
essentially to reduce the uncertainty

241
00:08:54,389 --> 00:08:52,240
associated with propellant residuals

242
00:08:56,790 --> 00:08:54,399
and thus improve the the mission

243
00:08:59,509 --> 00:08:56,800
performance margin calculation on on

244
00:09:00,790 --> 00:08:59,519
future missions

245
00:09:05,750 --> 00:09:00,800
rob

246
00:09:08,630 --> 00:09:05,760
i guess for elon um you mentioned uh

247
00:09:10,790 --> 00:09:08,640
having some challenges with the quads

248
00:09:12,550 --> 00:09:10,800
um can you go into a little more detail

249
00:09:16,310 --> 00:09:12,560
and i think you have a burn coming up

250
00:09:17,590 --> 00:09:16,320
pretty soon will you be doing that burn

251
00:09:19,910 --> 00:09:17,600
um well i mean right now i'm on the

252
00:09:21,750 --> 00:09:19,920
phone so uh i

253
00:09:23,110 --> 00:09:21,760
when i left about

254
00:09:24,310 --> 00:09:23,120
15 minutes ago everything was looking

255
00:09:25,750 --> 00:09:24,320
good

256
00:09:28,230 --> 00:09:25,760
and

257
00:09:29,829 --> 00:09:28,240
there was um

258
00:09:30,710 --> 00:09:29,839
an isolation valve

259
00:09:33,670 --> 00:09:30,720
that

260
00:09:35,750 --> 00:09:33,680
feeds two of the

261
00:09:36,710 --> 00:09:35,760
thruster

262
00:09:39,110 --> 00:09:36,720
and

263
00:09:41,509 --> 00:09:39,120

that that valve was was not responding

264
00:09:43,030 --> 00:09:41,519
so we went to the

265
00:09:44,230 --> 00:09:43,040
the backup valve and that that one

266
00:09:46,150 --> 00:09:44,240
worked fine

267
00:09:47,430 --> 00:09:46,160
so

268
00:09:49,910 --> 00:09:47,440
when i left

269
00:09:52,230 --> 00:09:49,920
everything was looking good for

270
00:09:53,350 --> 00:09:52,240
you know all thrusters enabled on on the

271
00:09:54,710 --> 00:09:53,360
vehicle

272
00:09:56,470 --> 00:09:54,720
so

273
00:10:00,710 --> 00:09:56,480
as far as i know the we're on track to

274
00:10:05,430 --> 00:10:02,790
hi elon this is stephen clark with space

275
00:10:07,430 --> 00:10:05,440
flight now just a question looking ahead

276
00:10:08,710 --> 00:10:07,440
for the rest of the year with the

277
00:10:10,069 --> 00:10:08,720
trouble getting

278
00:10:12,790 --> 00:10:10,079
this rocket off

279
00:10:14,310 --> 00:10:12,800
over the last few weeks

280
00:10:15,269 --> 00:10:14,320
does this affect how many launches you

281
00:10:17,269 --> 00:10:15,279
planned for the rest of the year i

282
00:10:18,550 --> 00:10:17,279
believe it was 10 total

283
00:10:20,470 --> 00:10:18,560
before this

284
00:10:24,790 --> 00:10:20,480
and

285
00:10:26,150 --> 00:10:24,800
the the thruster pod issue is it related

286
00:10:31,269 --> 00:10:26,160
at all to the

287
00:10:34,230 --> 00:10:32,389
uh

288
00:10:36,949 --> 00:10:34,240

so i mean i think we think we can

289
00:10:38,310 --> 00:10:36,959
probably still do 10 but um it's

290
00:10:40,069 --> 00:10:38,320
probably it's a bit too early to tell if

291
00:10:41,190 --> 00:10:40,079
all 10 will occur this year

292
00:10:44,550 --> 00:10:41,200
um

293
00:10:48,310 --> 00:10:44,560
the uh the the the main constraint is

294
00:10:49,190 --> 00:10:48,320
actually on vehicle production uh which

295
00:10:50,069 --> 00:10:49,200
uh

296
00:10:54,150 --> 00:10:50,079
and

297
00:10:56,150 --> 00:10:54,160
particular part which is an injector

298
00:10:58,069 --> 00:10:56,160
casting

299
00:11:01,509 --> 00:10:58,079
and we we think we've resolved that

300
00:11:02,630 --> 00:11:01,519
particular issue which should unlock

301
00:11:03,990 --> 00:11:02,640
the

302
00:11:05,110 --> 00:11:04,000
you know quite a high rate of boost

303
00:11:06,470 --> 00:11:05,120
production

304
00:11:08,790 --> 00:11:06,480
um

305
00:11:09,829 --> 00:11:08,800
and uh yeah so bottom line is that i

306
00:11:11,269 --> 00:11:09,839
think

307
00:11:13,509 --> 00:11:11,279
we will

308
00:11:14,470 --> 00:11:13,519
do 10 or something very close to 10 this

309
00:11:16,630 --> 00:11:14,480
year

310
00:11:18,710 --> 00:11:16,640
uh you searched obviously it's a launch

311
00:11:21,509 --> 00:11:18,720
month um slightly better than launch

312
00:11:21,519 --> 00:11:25,190
and then

313
00:11:29,990 --> 00:11:26,710

we don't get know enough to say whether

314
00:11:31,350 --> 00:11:30,000
there's any commonality between this

315
00:11:33,590 --> 00:11:31,360
uh

316
00:11:35,030 --> 00:11:33,600
this particular valve and the

317
00:11:37,990 --> 00:11:35,040
valve issue and the one that occurred

318
00:11:41,590 --> 00:11:40,310
i don't think it's the same but you know

319
00:11:42,630 --> 00:11:41,600
it's always

320
00:11:51,430 --> 00:11:42,640
i

321
00:11:52,470 --> 00:11:51,440
same but we don't yet know

322
00:11:53,750 --> 00:11:52,480
okay we're going to take one more

323
00:11:55,269 --> 00:11:53,760
question here before we go to the

324
00:11:58,470 --> 00:11:55,279
telephone bridge and then we'll come

325
00:12:01,590 --> 00:11:58,480
back for uh follow-up questions bill uh

326
00:12:03,190 --> 00:12:01,600
bill harwich cbs news for mr musk um

327
00:12:05,110 --> 00:12:03,200
technical stuff aside i'm just wondering

328
00:12:06,389 --> 00:12:05,120
how you're feeling this is the third crs

329
00:12:08,069 --> 00:12:06,399
mission it's off the ground to a good

330
00:12:09,190 --> 00:12:08,079
start you've got a pretty good string

331
00:12:10,949 --> 00:12:09,200
going what are your what are your

332
00:12:12,389 --> 00:12:10,959
personal thoughts is uh

333
00:12:15,269 --> 00:12:12,399
i realize the mission's not over but i

334
00:12:17,829 --> 00:12:15,279
mean at this point anyway thanks

335
00:12:20,550 --> 00:12:17,839
um i'm feeling pretty excited and this

336
00:12:22,870 --> 00:12:20,560
is a happy day um i mean most important

337
00:12:24,389 --> 00:12:22,880
of all uh is that

338
00:12:26,629 --> 00:12:24,399

you know that

339
00:12:27,509 --> 00:12:26,639
we did a good job for nasa i mean

340
00:12:30,389 --> 00:12:27,519
the

341
00:12:31,350 --> 00:12:30,399
number one thing do we do a job for our

342
00:12:33,670 --> 00:12:31,360
customer

343
00:12:34,870 --> 00:12:33,680
so you know that's you know everything

344
00:12:36,629 --> 00:12:34,880
else is like

345
00:12:38,470 --> 00:12:36,639
secondary to that so

346
00:12:39,829 --> 00:12:38,480
i'm just glad we're able to

347
00:12:41,590 --> 00:12:39,839
to you know

348
00:12:43,670 --> 00:12:41,600
do the job of a contract for or at least

349
00:12:45,670 --> 00:12:43,680
thus far we're doing it

350
00:12:47,750 --> 00:12:45,680
maybe it hasn't get docked with the

351
00:12:49,990 --> 00:12:47,760
space station but um

352
00:12:53,030 --> 00:12:50,000
number one i'm super happy that we have

353
00:12:53,910 --> 00:12:53,040
made good progress so far in

354
00:12:56,790 --> 00:12:53,920
you know

355
00:12:58,069 --> 00:12:56,800
for for our nasa customers so

356
00:12:59,750 --> 00:12:58,079
and then

357
00:13:01,910 --> 00:12:59,760
on top of that i'm also excited that we

358
00:13:03,030 --> 00:13:01,920
got

359
00:13:04,949 --> 00:13:03,040
good data

360
00:13:06,949 --> 00:13:04,959
through

361
00:13:09,509 --> 00:13:06,959
max dynamic pressure the

362
00:13:11,110 --> 00:13:09,519
of of the re-entry of the boost stage

363
00:13:13,030 --> 00:13:11,120

and even though we probably won't get

364
00:13:15,350 --> 00:13:13,040
the stage back i think we're really

365
00:13:18,629 --> 00:13:15,360
starting to put the connect the dots of

366
00:13:20,310 --> 00:13:18,639
what's needed uh when you combine the

367
00:13:21,670 --> 00:13:20,320
takeover overlanding yesterday of the

368
00:13:24,470 --> 00:13:21,680
flight design

369
00:13:25,269 --> 00:13:24,480
uh landing legs um

370
00:13:27,509 --> 00:13:25,279
and

371
00:13:30,470 --> 00:13:27,519
the greater progress

372
00:13:34,949 --> 00:13:32,389
on this flight today

373
00:13:37,509 --> 00:13:34,959
i mean there's just only a few more dots

374
00:13:38,790 --> 00:13:37,519
that needs to be there to have it all

375
00:13:40,790 --> 00:13:38,800
all work

376
00:13:42,310 --> 00:13:40,800
um and i think that

377
00:13:44,389 --> 00:13:42,320
that that i think it's i think we've got

378
00:13:46,310 --> 00:13:44,399
a decent chance of bringing a stage back

379
00:13:48,150 --> 00:13:46,320
this year which is which would be

380
00:13:49,910 --> 00:13:48,160
wonderful

381
00:13:53,269 --> 00:13:49,920
because i think what we've done thus far

382
00:13:54,629 --> 00:13:53,279
is is evolutionary

383
00:13:56,150 --> 00:13:54,639
evolutionary improvements but but that

384
00:13:58,790 --> 00:13:56,160
holds the potential for something more

385
00:14:01,990 --> 00:14:00,069
all right let's go to the telephone

386
00:14:04,310 --> 00:14:02,000
bridge and start off with alan boyle

387
00:14:06,069 --> 00:14:04,320
alan

388
00:14:07,189 --> 00:14:06,079

hi i guess this would be for elon or

389
00:14:09,030 --> 00:14:07,199
hans

390
00:14:11,590 --> 00:14:09,040
some people had remarked about a dark

391
00:14:13,670 --> 00:14:11,600
plume that that rose up along the side

392
00:14:14,949 --> 00:14:13,680
of the rocket

393
00:14:17,430 --> 00:14:14,959
during launch

394
00:14:21,829 --> 00:14:17,440
was that any concern uh what was going

395
00:14:24,710 --> 00:14:22,870
yeah

396
00:14:26,230 --> 00:14:24,720
i i mean i know what happened but hans

397
00:14:28,230 --> 00:14:26,240
you weren't doing anything i i actually

398
00:14:29,829 --> 00:14:28,240
don't know either i i think i heard

399
00:14:31,189 --> 00:14:29,839
people say that but i don't know what

400
00:14:32,790 --> 00:14:31,199
the root cause is at this point in time

401
00:14:33,670 --> 00:14:32,800
it could have been water

402
00:14:35,990 --> 00:14:33,680
um

403
00:14:38,790 --> 00:14:36,000
yeah that's uh so i i i thought that

404
00:14:41,189 --> 00:14:38,800
question might be asked so i um looked

405
00:14:41,990 --> 00:14:41,199
into it and and uh

406
00:14:46,629 --> 00:14:42,000
we

407
00:14:48,790 --> 00:14:46,639
all around the pad um and

408
00:14:52,550 --> 00:14:48,800
we essentially what happens is we splash

409
00:14:55,829 --> 00:14:54,870
so a little embarrassing but

410
00:14:58,949 --> 00:14:55,839
no harm

411
00:15:02,230 --> 00:15:00,150
okay uh

412
00:15:04,949 --> 00:15:02,240
still on the phone uh dan leone from

413
00:15:06,150 --> 00:15:04,959

space news dan

414
00:15:08,870 --> 00:15:06,160
hi everybody thanks for having the

415
00:15:10,870 --> 00:15:08,880
conference call um i guess one for nasa

416
00:15:12,550 --> 00:15:10,880
and one for spacex can we just get a

417
00:15:15,509 --> 00:15:12,560
sanity check about when rendezvous and

418
00:15:16,389 --> 00:15:15,519
proxima proc operations are supposed to

419
00:15:18,710 --> 00:15:16,399
start

420
00:15:19,670 --> 00:15:18,720
from nasa and sort of a big picture

421
00:15:22,870 --> 00:15:19,680
question

422
00:15:24,790 --> 00:15:22,880
on reusability uh how far down the road

423
00:15:27,670 --> 00:15:24,800
as far as you know doing some back of

424
00:15:29,590 --> 00:15:27,680
the napkin calculations have you gotten

425
00:15:31,670 --> 00:15:29,600
to see whether

426
00:15:33,990 --> 00:15:31,680
the cheapest way to increase launch

427
00:15:37,509 --> 00:15:34,000
rates and have inexpensive launches is

428
00:15:39,509 --> 00:15:37,519
really to fly a stages back refurb them

429
00:15:40,790 --> 00:15:39,519
refuel them and send them back up versus

430
00:15:41,910 --> 00:15:40,800
you know maybe just trying to make a

431
00:15:43,910 --> 00:15:41,920
dent

432
00:15:46,389 --> 00:15:43,920
in the manufacturing side or something

433
00:15:48,150 --> 00:15:46,399
like this

434
00:15:49,990 --> 00:15:48,160
i'll start off with the rendezvous

435
00:15:51,670 --> 00:15:50,000
question basically

436
00:15:53,430 --> 00:15:51,680
the burn got delayed a little bit the

437
00:15:55,189 --> 00:15:53,440
burn actually wasn't required but it

438
00:15:57,030 --> 00:15:55,199

won't affect the overall rendezvous

439
00:15:58,470 --> 00:15:57,040
sequence it'll still be on sunday pretty

440
00:16:00,150 --> 00:15:58,480
much as it's planned there may be a

441
00:16:01,430 --> 00:16:00,160
couple minutes of movement but not very

442
00:16:03,269 --> 00:16:01,440
much it's really set on lighting

443
00:16:05,590 --> 00:16:03,279
conditions so all the rendezvous stuff

444
00:16:07,269 --> 00:16:05,600
that we had planned will be pretty much

445
00:16:08,629 --> 00:16:07,279
as it's been published pre-flight this

446
00:16:15,350 --> 00:16:08,639
is just some minor changes and you'll

447
00:16:19,350 --> 00:16:17,269
so uh george to answer the question of

448
00:16:21,189 --> 00:16:19,360
like what is roof reflect likely to do

449
00:16:23,749 --> 00:16:21,199
um is that

450
00:16:25,749 --> 00:16:23,759
which

451
00:16:27,110 --> 00:16:25,759
just let me to give it context for

452
00:16:29,990 --> 00:16:27,120
example parts of the shuttle were

453
00:16:31,590 --> 00:16:30,000
reusable and the shuttle was impressive

454
00:16:32,870 --> 00:16:31,600
although i don't think anyone would

455
00:16:34,870 --> 00:16:32,880
argue that it was particularly

456
00:16:37,030 --> 00:16:34,880
inexpensive

457
00:16:38,790 --> 00:16:37,040
uh true uh so

458
00:16:40,949 --> 00:16:38,800
there is a um

459
00:16:43,350 --> 00:16:40,959
a step beyond simply reusing something

460
00:16:45,189 --> 00:16:43,360
that is important uh what's or some

461
00:16:46,949 --> 00:16:45,199
conditions on reuse in order to make the

462
00:16:49,269 --> 00:16:46,959
reuse um

463
00:16:52,069 --> 00:16:49,279

have a a big effect on the space

464
00:16:54,550 --> 00:16:52,079
industry which is that the reuse must be

465
00:16:55,430 --> 00:16:54,560
both rapid and complete

466
00:16:57,509 --> 00:16:55,440
um

467
00:16:59,269 --> 00:16:57,519
like an aircraft or a car or something

468
00:17:01,030 --> 00:16:59,279
like that

469
00:17:02,629 --> 00:17:01,040
if you have to disassemble and

470
00:17:04,870 --> 00:17:02,639
reassemble a car and change a bunch of

471
00:17:06,309 --> 00:17:04,880
parts in between driving it would make

472
00:17:07,590 --> 00:17:06,319
it quite expensive

473
00:17:09,990 --> 00:17:07,600
um

474
00:17:13,590 --> 00:17:11,750
we don't it's true that we don't just

475
00:17:16,470 --> 00:17:13,600
have to recover it we have to show that

476
00:17:19,669 --> 00:17:16,480
it can be reflown

477
00:17:21,189 --> 00:17:19,679
quickly and and easily with i said

478
00:17:22,470 --> 00:17:21,199
but the only change with the only thing

479
00:17:25,189 --> 00:17:22,480
changing being

480
00:17:27,669 --> 00:17:25,199
um reloading propellant um and another

481
00:17:29,190 --> 00:17:27,679
expensive you know

482
00:17:32,549 --> 00:17:29,200
basically

483
00:17:33,990 --> 00:17:32,559
the equivalent of refueling so

484
00:17:35,830 --> 00:17:34,000
um

485
00:17:37,830 --> 00:17:35,840
now the vehicle is is sort of designed

486
00:17:39,029 --> 00:17:37,840
for that um

487
00:17:40,710 --> 00:17:39,039
you know the unfortunate thing with the

488
00:17:42,549 --> 00:17:40,720

shuttle was that the the original design

489
00:17:44,390 --> 00:17:42,559
for the shuttle was

490
00:17:45,750 --> 00:17:44,400
um like

491
00:17:47,590 --> 00:17:45,760
well well sort of

492
00:17:49,590 --> 00:17:47,600
fairly well suited for

493
00:17:51,590 --> 00:17:49,600
a good reuse but then

494
00:17:54,390 --> 00:17:51,600
the requirements changed and made it

495
00:17:56,470 --> 00:17:54,400
very difficult to to reuse uh

496
00:17:58,230 --> 00:17:56,480
efficiently

497
00:18:00,070 --> 00:17:58,240
and

498
00:18:01,430 --> 00:18:00,080
you know so as long as we were able to

499
00:18:03,110 --> 00:18:01,440
hold to

500
00:18:04,549 --> 00:18:03,120
our our requirements i think we will be

501
00:18:07,190 --> 00:18:04,559
able to achieve the

502
00:18:08,789 --> 00:18:07,200
rapid and and essentially complete reuse

503
00:18:11,430 --> 00:18:08,799
um

504
00:18:13,270 --> 00:18:11,440
and uh so what i'm hoping will occur is

505
00:18:14,870 --> 00:18:13,280
and i'm feeling a little bit more

506
00:18:18,310 --> 00:18:14,880
optimistic about it is that this year at

507
00:18:19,830 --> 00:18:18,320
least we will recover the rocket booster

508
00:18:22,470 --> 00:18:19,840
i'm not sure we'll be able to re-fly it

509
00:18:23,909 --> 00:18:22,480
this year but i i think um re-flying it

510
00:18:26,710 --> 00:18:23,919
next year is

511
00:18:27,830 --> 00:18:26,720
is um is likely if we recover it this

512
00:18:28,950 --> 00:18:27,840
year

513
00:18:31,430 --> 00:18:28,960

and

514
00:18:32,870 --> 00:18:31,440
then you know that that'll

515
00:18:35,669 --> 00:18:32,880
complete the picture at least as far as

516
00:18:37,590 --> 00:18:35,679
the boost stage is concerned

517
00:18:41,990 --> 00:18:37,600
okay our next question is from michael

518
00:18:46,390 --> 00:18:43,909
hi there a question for elon i'm

519
00:18:47,350 --> 00:18:46,400
wondering how far down range

520
00:18:50,150 --> 00:18:47,360
the

521
00:18:52,230 --> 00:18:50,160
field was maybe off and

522
00:18:55,430 --> 00:18:52,240
how far downrange from the cape on

523
00:18:59,669 --> 00:18:57,029
uh sorry but it was a bit hard to hear i

524
00:19:01,510 --> 00:18:59,679
think you said how far down range

525
00:19:05,669 --> 00:19:01,520
um

526
00:19:07,110 --> 00:19:05,679
i think it's uh

527
00:19:09,510 --> 00:19:07,120
it's about four or 500 kilometers

528
00:19:11,830 --> 00:19:09,520
downrange um

529
00:19:13,029 --> 00:19:11,840
away from the cape essentially um

530
00:19:15,270 --> 00:19:13,039
and then

531
00:19:20,789 --> 00:19:15,280
the nearest shore is uh

532
00:19:25,750 --> 00:19:22,549
and that's at main engine cut-off or

533
00:19:27,350 --> 00:19:25,760
re-entry or both that's where that's

534
00:19:32,390 --> 00:19:27,360
sort of the normal

535
00:19:35,110 --> 00:19:33,830
which it was headed for i should mention

536
00:19:36,950 --> 00:19:35,120
that it was

537
00:19:43,990 --> 00:19:36,960
headed quite precisely for the the

538
00:19:57,029 --> 00:19:46,070

okay the next question is from rand

539
00:20:00,390 --> 00:19:58,310
because hopefully we'll have the

540
00:20:02,230 --> 00:20:00,400
aircraft telemetry that i'd like to look

541
00:20:06,230 --> 00:20:02,240
at so i'll just be on for another two

542
00:20:10,470 --> 00:20:07,350
okay um

543
00:20:13,029 --> 00:20:10,480
let's try miriam cramer miriam

544
00:20:15,669 --> 00:20:13,039
hey um yeah miriam famer with space.com

545
00:20:18,549 --> 00:20:15,679
uh so i have one question for spacex and

546
00:20:21,750 --> 00:20:18,559
another for nasa um and i'm wondering

547
00:20:24,230 --> 00:20:21,760
uh for elon i think were the multiple

548
00:20:26,870 --> 00:20:24,240
delays um challenging i mean was this

549
00:20:28,390 --> 00:20:26,880
kind of a test uh for the team just

550
00:20:31,110 --> 00:20:28,400
having to push it back and push it back

551
00:20:33,990 --> 00:20:31,120
and push it back um and then i'm for for

552
00:20:36,230 --> 00:20:34,000
nasa i'm curious does this mean um that

553
00:20:40,070 --> 00:20:36,240
the orbital launch is officially put off

554
00:20:43,909 --> 00:20:42,710
well i mean from the spacex we

555
00:20:45,270 --> 00:20:43,919
yeah

556
00:20:48,470 --> 00:20:45,280
there was there were a fair bit of new

557
00:20:50,549 --> 00:20:48,480
things with this rocket and with the

558
00:20:52,470 --> 00:20:50,559
dragon avionics this was actually quite

559
00:20:54,310 --> 00:20:52,480
a substantial revision of dragon

560
00:20:55,990 --> 00:20:54,320
avionics for example and a new software

561
00:20:57,270 --> 00:20:56,000
that accompanied it and of course the

562
00:20:58,870 --> 00:20:57,280
rocket had the

563
00:21:01,029 --> 00:20:58,880

landing legs

564
00:21:03,510 --> 00:21:01,039
and improved nitrogen thrusters and a

565
00:21:05,669 --> 00:21:03,520
few other things so

566
00:21:07,430 --> 00:21:05,679
uh it was definitely just definitely not

567
00:21:09,830 --> 00:21:07,440
our you know in the future we want to

568
00:21:10,789 --> 00:21:09,840
try to get to

569
00:21:12,789 --> 00:21:10,799
launching

570
00:21:13,909 --> 00:21:12,799
exactly on time without any delays

571
00:21:14,950 --> 00:21:13,919
um

572
00:21:20,070 --> 00:21:14,960
and

573
00:21:21,190 --> 00:21:20,080
having delays that's not our aspiration

574
00:21:23,350 --> 00:21:21,200
but i think the team

575
00:21:24,789 --> 00:21:23,360
did do a great job of responding to the

576
00:21:26,549 --> 00:21:24,799
various issues

577
00:21:28,710 --> 00:21:26,559
and i'm certainly very proud of what

578
00:21:30,630 --> 00:21:28,720
they've done

579
00:21:32,390 --> 00:21:30,640
yeah i think another thing to consider

580
00:21:33,990 --> 00:21:32,400
is space station is a pretty tough thing

581
00:21:35,909 --> 00:21:34,000
to do the rendezvous with when we look

582
00:21:37,510 --> 00:21:35,919
at all the constraints because we had

583
00:21:39,270 --> 00:21:37,520
you know progress flights coming up

584
00:21:41,590 --> 00:21:39,280
we've got some eva

585
00:21:43,110 --> 00:21:41,600
activities coming up pretty quickly

586
00:21:45,190 --> 00:21:43,120
we've got the

587
00:21:47,270 --> 00:21:45,200
soyuz landing and soyuz launch cycle

588
00:21:49,029 --> 00:21:47,280

coming up so and then we have to watch

589
00:21:51,029 --> 00:21:49,039
the dragon landing and the dragon

590
00:21:52,710 --> 00:21:51,039
landing has to be again set by orbital

591
00:21:54,710 --> 00:21:52,720
mechanics and where space station is and

592
00:21:56,149 --> 00:21:54,720
when you undock and where you put the

593
00:21:58,470 --> 00:21:56,159
dragon with respect to the coast of

594
00:21:59,830 --> 00:21:58,480
california that's another constraint so

595
00:22:01,990 --> 00:21:59,840
you put all those together and that

596
00:22:03,590 --> 00:22:02,000
makes space station flights even tougher

597
00:22:05,590 --> 00:22:03,600
from a manifesting standpoint so it's

598
00:22:06,870 --> 00:22:05,600
not only the hardware and the weather

599
00:22:08,149 --> 00:22:06,880
and the normal things with the rocket

600
00:22:10,470 --> 00:22:08,159
but then you've got all these unique

601
00:22:12,870 --> 00:22:10,480
phasing things that that play in and

602
00:22:15,029 --> 00:22:12,880
that makes it a pretty tough scenario to

603
00:22:17,029 --> 00:22:15,039
get a good launch

604
00:22:18,789 --> 00:22:17,039
together and make it work so the team

605
00:22:20,390 --> 00:22:18,799
again working last night to protect

606
00:22:21,830 --> 00:22:20,400
today's option was tremendously

607
00:22:24,950 --> 00:22:21,840
important to us that that really worked

608
00:22:26,789 --> 00:22:24,960
out well to your question about orbital

609
00:22:28,149 --> 00:22:26,799
because i'm superstitious we'll probably

610
00:22:30,390 --> 00:22:28,159
continue to ask orbital to keep

611
00:22:32,070 --> 00:22:30,400
preparing for may 6 until we get dragon

612
00:22:34,310 --> 00:22:32,080
safely

613
00:22:35,750 --> 00:22:34,320

attached to station and birth but once

614
00:22:37,669 --> 00:22:35,760
dragon becomes

615
00:22:39,750 --> 00:22:37,679
safely attached and birthed on sunday

616
00:22:41,350 --> 00:22:39,760
then we'll release the orbital team but

617
00:22:42,950 --> 00:22:41,360
i think until then we'll ask orbital

618
00:22:44,710 --> 00:22:42,960
still protect till may and then after

619
00:22:46,149 --> 00:22:44,720
that that birthing occurs we'll then

620
00:22:49,029 --> 00:22:46,159
release the orbital team and let them

621
00:22:50,710 --> 00:22:49,039
move into the june time frame

622
00:22:54,230 --> 00:22:50,720
our next question on the phone is from

623
00:23:00,950 --> 00:22:54,240
joseph abbott

624
00:23:02,789 --> 00:23:00,960
first i was going to ask if you have a

625
00:23:04,149 --> 00:23:02,799
date set now for the orbcom launch

626
00:23:06,149 --> 00:23:04,159
coming up

627
00:23:09,029 --> 00:23:06,159
and i was going to als i was also

628
00:23:11,590 --> 00:23:09,039
wanting to know if you could tell me

629
00:23:14,390 --> 00:23:11,600
how many more tests on the f9 or

630
00:23:16,310 --> 00:23:14,400
development vehicle at mcgregor before

631
00:23:18,630 --> 00:23:16,320
it moves on to spaceport america and new

632
00:23:19,990 --> 00:23:18,640
mexico

633
00:23:21,190 --> 00:23:20,000
for elon

634
00:23:22,230 --> 00:23:21,200
sure i'll

635
00:23:23,830 --> 00:23:22,240
answer that question then i'm gonna have

636
00:23:25,270 --> 00:23:23,840
to jump for the call

637
00:23:29,190 --> 00:23:25,280
um

638
00:23:31,510 --> 00:23:29,200

so let's see so for the ovcom launch is

639
00:23:33,350 --> 00:23:31,520
expected to to happen in the next four

640
00:23:34,950 --> 00:23:33,360
to six weeks um

641
00:23:37,029 --> 00:23:34,960
and uh you know

642
00:23:38,950 --> 00:23:37,039
we want to obviously make sure we review

643
00:23:40,230 --> 00:23:38,960
carefully the data from this launch

644
00:23:41,909 --> 00:23:40,240
because although i mean everything went

645
00:23:43,269 --> 00:23:41,919
fine but we always review the data to

646
00:23:45,430 --> 00:23:43,279
see if there were any

647
00:23:47,909 --> 00:23:45,440
near-miss issues that need to be looked

648
00:23:49,269 --> 00:23:47,919
into and corrected

649
00:23:51,190 --> 00:23:49,279
we don't know of anything yet but we

650
00:23:54,710 --> 00:23:51,200
want to make sure of that and

651
00:23:56,070 --> 00:23:54,720
then uh regarding the f9r um

652
00:23:57,110 --> 00:23:56,080
we're going to have

653
00:23:58,549 --> 00:23:57,120
uh

654
00:24:01,590 --> 00:23:58,559
really

655
00:24:04,870 --> 00:24:01,600
we're going to keep doing tests um at a

656
00:24:07,750 --> 00:24:04,880
mcgregor test site near waco

657
00:24:09,029 --> 00:24:07,760
with the f9r stage this so what we have

658
00:24:14,470 --> 00:24:09,039
at uh

659
00:24:19,350 --> 00:24:16,630
what's called fnr dev1 which is sort of

660
00:24:21,190 --> 00:24:19,360
developing unit one there's dev2

661
00:24:23,350 --> 00:24:21,200
um and

662
00:24:25,110 --> 00:24:23,360
so one of those will be at uh

663
00:24:28,549 --> 00:24:25,120

mcgregor one of them will be at uh

664
00:24:31,190 --> 00:24:28,559
spaceport america in new mexico

665
00:24:33,510 --> 00:24:31,200
and so so anything we can test at a

666
00:24:36,149 --> 00:24:33,520
relatively low altitude

667
00:24:37,669 --> 00:24:36,159
so below around ten thousand feet uh

668
00:24:41,269 --> 00:24:37,679
we'll continue to do

669
00:24:43,510 --> 00:24:41,279
um in uh in mcgregor uh and and then the

670
00:24:46,630 --> 00:24:43,520
the high altitude stuff where it's going

671
00:24:48,149 --> 00:24:46,640
extra atmospheric and um you know going

672
00:24:50,390 --> 00:24:48,159
going to sort of

673
00:24:51,190 --> 00:24:50,400
300 000 feet plus and that kind of thing

674
00:24:52,870 --> 00:24:51,200
will

675
00:24:55,750 --> 00:24:52,880
um we'll be doing in mexico because we

676
00:24:57,510 --> 00:24:55,760
just need a much bigger clear area

677
00:24:59,190 --> 00:24:57,520
um but i would expect those those tests

678
00:25:01,110 --> 00:24:59,200
to be we will continue refining the

679
00:25:02,310 --> 00:25:01,120
technology over time

680
00:25:03,669 --> 00:25:02,320
because

681
00:25:04,789 --> 00:25:03,679
we had further question that was asked

682
00:25:06,630 --> 00:25:04,799
earlier

683
00:25:08,470 --> 00:25:06,640
you know reusability

684
00:25:12,230 --> 00:25:08,480
only matters to the degree that to agree

685
00:25:13,510 --> 00:25:12,240
that it's rapid and complete

686
00:25:15,269 --> 00:25:13,520
otherwise

687
00:25:17,029 --> 00:25:15,279
it's sort of reusability but you don't

688
00:25:18,230 --> 00:25:17,039

you don't get the equivalent economic

689
00:25:20,470 --> 00:25:18,240
benefit that

690
00:25:22,230 --> 00:25:20,480
that has uh you know huge

691
00:25:24,230 --> 00:25:22,240
huge potential to to open up space

692
00:25:26,789 --> 00:25:24,240
flight

693
00:25:28,390 --> 00:25:26,799
all right thanks for the question

694
00:25:30,390 --> 00:25:28,400
all right mr bus thank you for being

695
00:25:33,110 --> 00:25:30,400
with us uh we'll try one more

696
00:25:34,630 --> 00:25:33,120
time for rand simberg on the telephone

697
00:25:37,190 --> 00:25:34,640
rand are you there

698
00:25:41,430 --> 00:25:39,590
go ahead with your question please

699
00:25:46,070 --> 00:25:41,440
yeah if elon's still available because

700
00:25:49,269 --> 00:25:47,269
i'm assuming that you're going to try

701
00:25:52,789 --> 00:25:49,279
another water landing uh you're not

702
00:25:54,149 --> 00:25:52,799
going to attempt land uh on on any on

703
00:25:55,990 --> 00:25:54,159
the next one i don't get this question

704
00:25:57,510 --> 00:25:56,000
did you get enough data to give you

705
00:25:58,549 --> 00:25:57,520
confidence that you can fly back to land

706
00:25:59,750 --> 00:25:58,559
or you're going to try it in the water

707
00:26:01,590 --> 00:25:59,760
again and

708
00:26:03,430 --> 00:26:01,600
how much of a setback is it that you

709
00:26:04,789 --> 00:26:03,440
still haven't actually recovered a stage

710
00:26:07,110 --> 00:26:04,799
to see how much wear you're actually

711
00:26:08,310 --> 00:26:07,120
getting on it

712
00:26:10,070 --> 00:26:08,320
unfortunately

713
00:26:11,190 --> 00:26:10,080

he had to hang up i don't know hans if

714
00:26:13,430 --> 00:26:11,200
you would be able to address the

715
00:26:16,390 --> 00:26:13,440
question or not i i can hear i think um

716
00:26:18,070 --> 00:26:16,400
that the next vehicle is going to try a

717
00:26:21,750 --> 00:26:18,080
water landing again

718
00:26:24,950 --> 00:26:21,760
um and honestly i think the data are

719
00:26:25,990 --> 00:26:24,960
at this point in time really what we're

720
00:26:27,190 --> 00:26:26,000
after

721
00:26:29,190 --> 00:26:27,200
um

722
00:26:30,870 --> 00:26:29,200
and and that gives us the the clues to

723
00:26:33,669 --> 00:26:30,880
to make the uh

724
00:26:35,510 --> 00:26:33,679
uh any changes or like

725
00:26:37,510 --> 00:26:35,520
allows us to to continue this

726
00:26:39,510 --> 00:26:37,520
development so i i would say

727
00:26:41,190 --> 00:26:39,520
um we didn't

728
00:26:43,350 --> 00:26:41,200
as i said earlier you know we didn't

729
00:26:45,510 --> 00:26:43,360
really expect those the stages to to

730
00:26:48,149 --> 00:26:45,520
come back you know or we had you know

731
00:26:50,830 --> 00:26:48,159
some hope of course but um overall i

732
00:26:53,430 --> 00:26:50,840
think the data is uh much more important

733
00:26:54,390 --> 00:26:53,440
here okay we're back in the room uh

734
00:26:58,789 --> 00:26:54,400
jason

735
00:27:01,110 --> 00:26:58,799
this question goes to hans and i have

736
00:27:02,630 --> 00:27:01,120
another one um

737
00:27:04,070 --> 00:27:02,640
while it's true you didn't get the

738
00:27:05,750 --> 00:27:04,080

landing you might have wanted did you

739
00:27:07,430 --> 00:27:05,760
see anything in the telemetry data that

740
00:27:09,590 --> 00:27:07,440
said okay we're on the right track here

741
00:27:11,110 --> 00:27:09,600
or perhaps maybe something that made you

742
00:27:13,029 --> 00:27:11,120
want to rethink something else sunlight

743
00:27:14,870 --> 00:27:13,039
could you talk a bit about that so from

744
00:27:16,710 --> 00:27:14,880
what i saw basically in the in the

745
00:27:17,830 --> 00:27:16,720
control room and uh and then on the

746
00:27:20,070 --> 00:27:17,840
video

747
00:27:21,990 --> 00:27:20,080
it looked uh it looked great it looked

748
00:27:24,549 --> 00:27:22,000
uh like it's doing what it's supposed to

749
00:27:25,909 --> 00:27:24,559
do um however there's data on top of

750
00:27:27,430 --> 00:27:25,919
that that that i haven't seen yet

751
00:27:30,070 --> 00:27:27,440
they're either on the boat or on the

752
00:27:31,669 --> 00:27:30,080
airplane and we need to we need those

753
00:27:33,669 --> 00:27:31,679
data to come back first and then put

754
00:27:35,430 --> 00:27:33,679
them together and see if you can get the

755
00:27:37,990 --> 00:27:35,440
uh the full picture basically from

756
00:27:40,950 --> 00:27:38,000
liftoff to to uh reentry and and

757
00:27:41,990 --> 00:27:40,960
possibly as far as possible into landing

758
00:27:43,430 --> 00:27:42,000
so

759
00:27:45,269 --> 00:27:43,440
and this was kind of off topic from the

760
00:27:46,630 --> 00:27:45,279
day but the other day uh gwen shotwell

761
00:27:48,710 --> 00:27:46,640
was here and the announcement was made

762
00:27:50,789 --> 00:27:48,720
that lc39a would be used for falcon

763
00:27:52,070 --> 00:27:50,799

heavy and that we expect to see the

764
00:27:53,590 --> 00:27:52,080
first launch in the first quarter of

765
00:27:55,110 --> 00:27:53,600
2015.

766
00:27:57,269 --> 00:27:55,120
my question goes that perhaps this has

767
00:27:58,630 --> 00:27:57,279
already been answered but up until then

768
00:27:59,590 --> 00:27:58,640
i believe the understanding was the

769
00:28:01,590 --> 00:27:59,600
first launch would occur out of

770
00:28:02,950 --> 00:28:01,600
vandenberg is that now change to where

771
00:28:05,269 --> 00:28:02,960
the first launch will take place in

772
00:28:08,630 --> 00:28:05,279
kennedy instead of vandenberg

773
00:28:12,789 --> 00:28:10,710
okay james

774
00:28:14,549 --> 00:28:12,799
uh james dean florida today hanzon so i

775
00:28:16,389 --> 00:28:14,559
just want to clarify a couple of details

776
00:28:18,470 --> 00:28:16,399
the uh the boats i understand weren't

777
00:28:21,110 --> 00:28:18,480
able to get close uh

778
00:28:23,269 --> 00:28:21,120
so far today but you are still trying to

779
00:28:24,470 --> 00:28:23,279
get out there and and find the booster

780
00:28:26,149 --> 00:28:24,480
or is there no point in doing that

781
00:28:28,389 --> 00:28:26,159
anymore it depends on the c-state and

782
00:28:29,990 --> 00:28:28,399
and and i i heard that the c-state is

783
00:28:32,230 --> 00:28:30,000
really um it's really pretty rough right

784
00:28:34,149 --> 00:28:32,240
now i'm pretty sure if they think it's

785
00:28:36,549 --> 00:28:34,159
safe then they will um you know move

786
00:28:38,149 --> 00:28:36,559
towards the stage and uh and take a look

787
00:28:39,590 --> 00:28:38,159
um also i don't know what the airplane

788
00:28:41,669 --> 00:28:39,600

saw um

789
00:28:43,510 --> 00:28:41,679
those those those

790
00:28:45,430 --> 00:28:43,520
data and news basically come back in a

791
00:28:46,230 --> 00:28:45,440
couple hours

792
00:28:48,549 --> 00:28:46,240
and the

793
00:28:49,990 --> 00:28:48,559
the source of the telemetry that you're

794
00:28:51,909 --> 00:28:50,000
talking about getting back is that the

795
00:28:53,350 --> 00:28:51,919
nasa aircraft or where is that coming

796
00:28:54,470 --> 00:28:53,360
from no this is a

797
00:28:57,269 --> 00:28:54,480
spacex

798
00:29:00,470 --> 00:28:59,190
just curious of the detail what what was

799
00:29:01,909 --> 00:29:00,480
flying up there because nasa was also

800
00:29:03,669 --> 00:29:01,919
tracking it uh cursed as well uh i'm

801
00:29:06,149 --> 00:29:03,679
just curious what was up there tracking

802
00:29:07,909 --> 00:29:06,159
yeah we were gonna have a p3 go fly and

803
00:29:09,830 --> 00:29:07,919
our intent was to take a look at the

804
00:29:11,430 --> 00:29:09,840
supersonic thruster firings that would

805
00:29:13,510 --> 00:29:11,440
occur and we wanted the data because

806
00:29:15,510 --> 00:29:13,520
that's applicable to mars entry descent

807
00:29:17,269 --> 00:29:15,520
landing we were unable to fly the

808
00:29:19,990 --> 00:29:17,279
aircraft because of icing conditions so

809
00:29:22,070 --> 00:29:20,000
we did not fly our p3 aircraft so it was

810
00:29:24,710 --> 00:29:22,080
a spacex aircraft that that captured

811
00:29:26,070 --> 00:29:24,720
telemetry that hans is talking about so

812
00:29:27,830 --> 00:29:26,080
we didn't get a chance to fly our

813
00:29:28,870 --> 00:29:27,840

aircraft okay

814
00:29:31,750 --> 00:29:28,880
and and

815
00:29:33,190 --> 00:29:31,760
data so far did it show uh

816
00:29:34,950 --> 00:29:33,200
or would it have shown if the landing

817
00:29:36,310 --> 00:29:34,960
lags did deploy or is that something

818
00:29:38,230 --> 00:29:36,320
that would come later

819
00:29:40,230 --> 00:29:38,240
that that's typically so the data we

820
00:29:41,590 --> 00:29:40,240
have right now at this arrow basically

821
00:29:44,310 --> 00:29:41,600
is the data that we got here from

822
00:29:46,230 --> 00:29:44,320
telford from from the range and and the

823
00:29:47,830 --> 00:29:46,240
range loses it goes over the horizon

824
00:29:51,590 --> 00:29:47,840
basically for the range

825
00:29:56,870 --> 00:29:52,549
bill

826
00:29:58,789 --> 00:29:56,880
can you clarify for me the the

827
00:30:00,549 --> 00:29:58,799
provisioning situation on station in the

828
00:30:01,909 --> 00:30:00,559
skip cycle and how all that plays out i

829
00:30:04,230 --> 00:30:01,919
was confused the other day when mr

830
00:30:05,830 --> 00:30:04,240
suffered any was talking to us about

831
00:30:07,669 --> 00:30:05,840
where your marks are out there for

832
00:30:08,789 --> 00:30:07,679
getting stuff up

833
00:30:11,430 --> 00:30:08,799
yeah i think

834
00:30:14,470 --> 00:30:11,440
the way we if we take no consumables

835
00:30:17,430 --> 00:30:14,480
resupply for a period of time um

836
00:30:19,990 --> 00:30:17,440
it i think we run into a skip cycle

837
00:30:21,669 --> 00:30:20,000
number which is like 45 days before we

838
00:30:23,029 --> 00:30:21,679

run out of critical consumables and i

839
00:30:25,029 --> 00:30:23,039
think food is one of the things that

840
00:30:26,950 --> 00:30:25,039
comes in roughly in the july time frame

841
00:30:29,029 --> 00:30:26,960
july august of this summer

842
00:30:30,789 --> 00:30:29,039
when we get spacex on board that'll push

843
00:30:32,310 --> 00:30:30,799
that date into the fall when we get

844
00:30:36,789 --> 00:30:32,320
orbital on board it'll even push it

845
00:30:41,029 --> 00:30:38,950
yeah it starts so then that's kind of

846
00:30:42,389 --> 00:30:41,039
the way we do that is we want to prepare

847
00:30:43,909 --> 00:30:42,399
if we have to bring the crew on because

848
00:30:45,430 --> 00:30:43,919
we're running out of supplies right

849
00:30:47,190 --> 00:30:45,440
that's the beginning of the clock that

850
00:30:48,950 --> 00:30:47,200
says we start preparing so we actually

851
00:30:51,909 --> 00:30:48,960
draw a line

852
00:30:53,750 --> 00:30:51,919
it's like the low uh low fuel light on

853
00:30:55,510 --> 00:30:53,760
your car right you still got quite a

854
00:30:57,029 --> 00:30:55,520
waste to drive but it's a warning that

855
00:30:59,509 --> 00:30:57,039
you are and that's and that's the july

856
00:31:02,950 --> 00:31:01,669
hi jared hayworth i'm a guest of nasa

857
00:31:04,389 --> 00:31:02,960
social and i'm a photographer with

858
00:31:06,149 --> 00:31:04,399
wehadtoday.com

859
00:31:08,230 --> 00:31:06,159
this is a question for hans looking down

860
00:31:09,590 --> 00:31:08,240
the road a little bit to the reusable

861
00:31:11,110 --> 00:31:09,600
first stage once the landing legs have

862
00:31:13,590 --> 00:31:11,120
been proven you're ready to start

863
00:31:14,630 --> 00:31:13,600

landing on the on land again

864
00:31:16,230 --> 00:31:14,640
where are you going to actually set

865
00:31:17,430 --> 00:31:16,240
these stages down this particularly

866
00:31:19,830 --> 00:31:17,440
thinking about something like a falcon

867
00:31:22,310 --> 00:31:19,840
heavy reusable where you have you know

868
00:31:23,190 --> 00:31:22,320
up to three stages coming back home

869
00:31:24,549 --> 00:31:23,200
that's going to be a particular

870
00:31:26,710 --> 00:31:24,559
challenge that's true um we're looking

871
00:31:28,710 --> 00:31:26,720
right now at landing sites um

872
00:31:30,710 --> 00:31:28,720
we we had a couple

873
00:31:32,149 --> 00:31:30,720
but we need we need to still evaluate

874
00:31:33,909 --> 00:31:32,159
exactly what's the best landing site

875
00:31:35,590 --> 00:31:33,919
here at the cape or yeah at the cape

876
00:31:36,870 --> 00:31:35,600
basically

877
00:31:38,389 --> 00:31:36,880
sorry you are still thinking somewhere

878
00:31:41,269 --> 00:31:38,399
here along the east coast somewhere on

879
00:31:42,549 --> 00:31:41,279
the florida coastline perhaps okay

880
00:31:44,630 --> 00:31:42,559
okay i think we'll take one more

881
00:31:46,549 --> 00:31:44,640
question and wrap it up go ahead please

882
00:31:48,549 --> 00:31:46,559
i am ian clought from the nasa social

883
00:31:50,470 --> 00:31:48,559
group and airlinereporter.com the

884
00:31:51,990 --> 00:31:50,480
question for spacex actually related to

885
00:31:55,190 --> 00:31:52,000
jared's question when you're bringing

886
00:31:56,950 --> 00:31:55,200
stages back have plans been started on

887
00:31:58,950 --> 00:31:56,960
how much airspace and ground area will

888
00:32:00,870 --> 00:31:58,960

have to be cleared for these tests and

889
00:32:01,909 --> 00:32:00,880
then how much will that come down when

890
00:32:04,389 --> 00:32:01,919
it gets too

891
00:32:07,110 --> 00:32:04,399
operational right so that's basically a

892
00:32:08,950 --> 00:32:07,120
question to to arrange safety um we

893
00:32:11,509 --> 00:32:08,960
we're basically um providing data for

894
00:32:13,430 --> 00:32:11,519
the analysis and then range safety will

895
00:32:14,870 --> 00:32:13,440
tell us how much space we need

896
00:32:16,070 --> 00:32:14,880
we believe it's about the same as what

897
00:32:18,470 --> 00:32:16,080
you need for

898
00:32:20,710 --> 00:32:18,480
a rocket going out

899
00:32:22,149 --> 00:32:20,720
coming back is a particular challenge

900
00:32:23,350 --> 00:32:22,159
but at the same time this stage is

901
00:32:25,750 --> 00:32:23,360
pretty empty

902
00:32:29,669 --> 00:32:25,760
so it's a safe state

903
00:32:31,830 --> 00:32:29,679
safe stage to come back basically

904
00:32:33,350 --> 00:32:31,840
okay uh do uh do you have any closing

905
00:32:34,789 --> 00:32:33,360
remarks

906
00:32:36,789 --> 00:32:34,799
again i would just say again

907
00:32:38,710 --> 00:32:36,799
congratulations to spacex on just a

908
00:32:39,909 --> 00:32:38,720
wonderful day today and tremendous

909
00:32:41,750 --> 00:32:39,919
preparation

910
00:32:44,950 --> 00:32:41,760
it's also fun for me to be down here in

911
00:32:47,110 --> 00:32:44,960
florida i got to go over and see orion

912
00:32:48,950 --> 00:32:47,120
get in testing over in the onc building

913
00:32:50,870 --> 00:32:48,960

they did their first sine wave sweep of

914
00:32:52,710 --> 00:32:50,880
the multi-vibration test of the orion

915
00:32:55,029 --> 00:32:52,720
capsule and they just completed all

916
00:32:57,190 --> 00:32:55,039
their avionics testing and power up so

917
00:32:58,710 --> 00:32:57,200
it's pretty exciting to see that vehicle

918
00:33:00,470 --> 00:32:58,720
come together that first beyond low

919
00:33:02,070 --> 00:33:00,480
earth orbit vehicle over in the onc

920
00:33:03,509 --> 00:33:02,080
building and if you get a chance you

921
00:33:05,430 --> 00:33:03,519
need to go over and see the vehicle as

922
00:33:06,710 --> 00:33:05,440
it goes through these next couple stages

923
00:33:08,789 --> 00:33:06,720
over the next couple months getting

924
00:33:10,549 --> 00:33:08,799
ready for the december launch so heat

925
00:33:11,990 --> 00:33:10,559
shield addition and putting it on top of

926
00:33:13,509 --> 00:33:12,000
the service module and looking at a

927
00:33:15,669 --> 00:33:13,519
launch abort system it's a pretty

928
00:33:17,190 --> 00:33:15,679
amazing spacecraft and it's fun for me

929
00:33:19,190 --> 00:33:17,200
as an engineer to get a chance to go see

930
00:33:22,070 --> 00:33:19,200
hardware again and get out of washington

931
00:33:23,750 --> 00:33:22,080
so this is an ultimately great visit for

932
00:33:25,430 --> 00:33:23,760
me down here i got to see our hardware

933
00:33:28,149 --> 00:33:25,440
beyond low earth orbit and i got to see

934
00:33:29,750 --> 00:33:28,159
a launch so it's a double win and a

935
00:33:32,149 --> 00:33:29,760
great weekend and a great start to the

936
00:33:34,870 --> 00:33:32,159
easter holiday so thanks to the ksc team

937
00:33:37,110 --> 00:33:34,880
again in the spacex team thank you

938
00:33:39,029 --> 00:33:37,120

yeah and and for me i'm i'm really happy

939
00:33:40,389 --> 00:33:39,039
that dragon is

940
00:33:42,149 --> 00:33:40,399
safe in orbit and

941
00:33:44,230 --> 00:33:42,159
on its way to the station

942
00:33:47,110 --> 00:33:44,240
i'm really looking forward to

943
00:33:50,389 --> 00:33:47,120
birthing at the station and uh and again

944
00:33:51,269 --> 00:33:50,399
also a great easter weekend

945
00:33:54,310 --> 00:33:51,279
all right

946
00:33:56,389 --> 00:33:54,320
uh thank you hans um the next uh plan

947
00:33:59,509 --> 00:33:56,399
televised event for spacex 3 is the

948
00:34:01,269 --> 00:33:59,519
grapple on sunday morning at about 7 14

949
00:34:04,230 --> 00:34:01,279
a.m with nasa television coverage

950
00:34:05,669 --> 00:34:04,240
beginning at 5 45 a.m between now and

951
00:34:07,509 --> 00:34:05,679
then you can keep track of all the

952
00:34:12,149 --> 00:34:07,519
activities that are happening by going

953
00:34:17,510 --> 00:34:14,710
spacex and we'll conclude with a replay

954
00:34:33,669 --> 00:34:17,520
of today's falcon 9 and dragon launch

955
00:34:33,679 --> 00:34:38,310
one

956
00:34:42,550 --> 00:34:41,430
and liftoff of the falcon 9 rocket and

957
00:34:45,669 --> 00:34:42,560
dragon

958
00:34:47,669 --> 00:34:45,679
spacex 3 is underway

959
00:34:50,310 --> 00:34:47,679
an american commercial spacecraft

960
00:34:52,550 --> 00:34:50,320
launching from u.s soil makes a special

961
00:34:56,790 --> 00:34:52,560
delivery of new science and technology