1
00:00:29,589 --> 00:00:27,589
[Music]

2
00:00:31,750 --> 00:00:29,599
good afternoon and welcome to nasa's

3
00:00:33,750 --> 00:00:31,760
kennedy space center i'm nasa press

4
00:00:35,830 --> 00:00:33,760
secretary jackie mcginnis

5
00:00:38,069 --> 00:00:35,840
and this morning nasa waved off the

6
00:00:39,990 --> 00:00:38,079
artemis one launch attempt after teams

7
00:00:42,389 --> 00:00:40,000
encountered a liquid hydrogen lake while

8
00:00:44,869 --> 00:00:42,399
filling propellant into the core stage

9
00:00:46,389 --> 00:00:44,879
of the sls rocket unfortunately the team

10
00:00:48,790 --> 00:00:46,399
wasn't able to troubleshoot the issue

11
00:00:50,790 --> 00:00:48,800
today but to tell us more about the next

12
00:00:52,229 --> 00:00:50,800
steps nasa will take following the

13
00:00:54,229 --> 00:00:52,239

mission management team meeting this

14
00:00:56,790 --> 00:00:54,239
afternoon we have with us nasa

15
00:00:58,389 --> 00:00:56,800
administrator bill nelson

16
00:01:00,389 --> 00:00:58,399
associate administrator of the

17
00:01:02,709 --> 00:01:00,399
exploration systems development mission

18
00:01:06,149 --> 00:01:02,719
directorate jim free

19
00:01:08,310 --> 00:01:06,159
and artemis mission manager mike serafin

20
00:01:10,950 --> 00:01:08,320
first i'll hand it over to senator

21
00:01:12,390 --> 00:01:10,960
nelson for opening remarks

22
00:01:15,749 --> 00:01:12,400
well while

23
00:01:17,749 --> 00:01:15,759
we don't have the launch that we wanted

24
00:01:21,190 --> 00:01:17,759
today

25
00:01:23,749 --> 00:01:21,200
i can tell you that these teams

26
00:01:26,950 --> 00:01:23,759
know exactly what they're doing and i'm

27
00:01:28,630 --> 00:01:26,960
very proud of them

28
00:01:30,149 --> 00:01:28,640
you think back

29
00:01:31,270 --> 00:01:30,159
to previous

30
00:01:33,429 --> 00:01:31,280
space

31
00:01:36,149 --> 00:01:33,439
flights

32
00:01:36,950 --> 00:01:36,159
the shuttle was sent back

33
00:01:41,510 --> 00:01:36,960
to

34
00:01:43,590 --> 00:01:41,520
the vehicle assembly building 20 times

35
00:01:46,550 --> 00:01:43,600
i already shared with you

36
00:01:47,749 --> 00:01:46,560
my personal experience back in the early

37
00:01:50,069 --> 00:01:47,759
part of the

38
00:01:51,030 --> 00:01:50,079

space shuttle program

39
00:01:54,469 --> 00:01:51,040
of

40
00:01:58,870 --> 00:01:54,479
hoot gibson's crew having been strapped

41
00:02:00,389 --> 00:01:58,880
in ready to go and scrub four times

42
00:02:04,310 --> 00:02:00,399
with a delay

43
00:02:10,710 --> 00:02:07,749
we do not launch until

44
00:02:14,070 --> 00:02:10,720
we think it's right

45
00:02:16,710 --> 00:02:14,080
and these uh teams have

46
00:02:19,030 --> 00:02:16,720
labored over that

47
00:02:21,430 --> 00:02:19,040
and that is the conclusion that they

48
00:02:24,710 --> 00:02:21,440
came to

49
00:02:25,750 --> 00:02:24,720
so i look at this as a part of our space

50
00:02:28,229 --> 00:02:25,760
program

51
00:02:33,190 --> 00:02:28,239
of which safety

52
00:02:37,270 --> 00:02:35,110
they will tell you

53
00:02:40,630 --> 00:02:37,280
starting with jim

54
00:02:43,430 --> 00:02:40,640
they'll tell you the specific reasons

55
00:02:44,630 --> 00:02:43,440
why they decided to stand down

56
00:02:48,150 --> 00:02:44,640
and what

57
00:02:50,710 --> 00:02:48,160
they think that the future holds

58
00:02:52,949 --> 00:02:50,720
just remember we're not going to launch

59
00:02:57,910 --> 00:02:52,959
until it's right

60
00:03:01,190 --> 00:02:57,920
and that is standard operating procedure

61
00:03:02,550 --> 00:03:01,200
and will continue to be

62
00:03:05,589 --> 00:03:02,560
thank you sir

63
00:03:07,509 --> 00:03:05,599

good afternoon so absolutely i hope you

64
00:03:09,190 --> 00:03:07,519
know we're not where we want to be

65
00:03:11,350 --> 00:03:09,200
except for the vehicle's safe so we

66
00:03:13,190 --> 00:03:11,360
wanted it safe in orbit it's not there

67
00:03:15,110 --> 00:03:13,200
it's safe on the ground

68
00:03:16,790 --> 00:03:15,120
um i'm going to kind of give you the big

69
00:03:18,550 --> 00:03:16,800
picture of where we're headed with the

70
00:03:20,710 --> 00:03:18,560
launch periods

71
00:03:24,309 --> 00:03:20,720
and then i'll let mike fill you in on

72
00:03:26,630 --> 00:03:24,319
some of the things that happened today

73
00:03:29,509 --> 00:03:26,640
charlie blackwell thompson is back in

74
00:03:31,270 --> 00:03:29,519
the launch control center with her team

75
00:03:33,350 --> 00:03:31,280
working through some of the next steps

76
00:03:35,589 --> 00:03:33,360
that the mission management team asked

77
00:03:36,470 --> 00:03:35,599
her to do today

78
00:03:37,350 --> 00:03:36,480
um

79
00:03:38,149 --> 00:03:37,360
so

80
00:03:40,630 --> 00:03:38,159
we

81
00:03:43,350 --> 00:03:40,640
launched period 25 is uh definitely off

82
00:03:45,589 --> 00:03:43,360
the table we won't be launching uh you

83
00:03:46,949 --> 00:03:45,599
know this period ends on tuesday will

84
00:03:49,030 --> 00:03:46,959
not be launching

85
00:03:52,710 --> 00:03:49,040
uh in this launch period

86
00:03:55,509 --> 00:03:52,720
um launch period 26 and 27

87
00:03:59,830 --> 00:03:55,519
will really depend on the options that

88
00:04:01,910 --> 00:03:59,840

the team comes back with likely on

89
00:04:04,309 --> 00:04:01,920
or early tuesday morning and michael

90
00:04:06,869 --> 00:04:04,319
talk through those options with you

91
00:04:09,589 --> 00:04:06,879
one thing i'll point out is we

92
00:04:11,509 --> 00:04:09,599
will deconflict with crew five so there

93
00:04:13,990 --> 00:04:11,519
is an overlap with our

94
00:04:16,069 --> 00:04:14,000
next launch period and the time frame on

95
00:04:18,550 --> 00:04:16,079
crew 5 wants to go we we need to make

96
00:04:19,990 --> 00:04:18,560
sure we deconflict with them so that

97
00:04:22,390 --> 00:04:20,000
will weigh into

98
00:04:25,350 --> 00:04:22,400
into what we do

99
00:04:28,629 --> 00:04:25,360
and then as we get into launch period 27

100
00:04:31,189 --> 00:04:28,639
uh in the latter part of october

101
00:04:33,510 --> 00:04:31,199
we will be looking at a lot of things

102
00:04:35,510 --> 00:04:33,520
our limited life items

103
00:04:36,390 --> 00:04:35,520
our stay on the pad durations that we

104
00:04:38,150 --> 00:04:36,400
have

105
00:04:40,629 --> 00:04:38,160
and uh and of course we're always

106
00:04:42,310 --> 00:04:40,639
looking at at weather as a as a general

107
00:04:44,390 --> 00:04:42,320
course of action for some of the storm

108
00:04:45,990 --> 00:04:44,400
activity that can be out there

109
00:04:47,590 --> 00:04:46,000
um

110
00:04:50,469 --> 00:04:47,600
i'm sure there's going to be a question

111
00:04:52,230 --> 00:04:50,479
of are we confident right i actually

112
00:04:53,590 --> 00:04:52,240
love that question because it's like are

113
00:04:56,230 --> 00:04:53,600

you confident you were going to get out

114
00:04:58,150 --> 00:04:56,240
of bed this morning um we're we don't go

115
00:04:59,990 --> 00:04:58,160
into these tests lightly right we we

116
00:05:01,189 --> 00:05:00,000
don't just say hey we think we hope this

117
00:05:03,270 --> 00:05:01,199
is going to work

118
00:05:05,110 --> 00:05:03,280
um the confident confidence to do

119
00:05:06,870 --> 00:05:05,120
another launch attempt today was born

120
00:05:08,710 --> 00:05:06,880
out of the fact that

121
00:05:11,270 --> 00:05:08,720
we understood the hydrogen leaks that we

122
00:05:13,749 --> 00:05:11,280
had on on monday those are different

123
00:05:16,230 --> 00:05:13,759
than the leak that we had today

124
00:05:18,230 --> 00:05:16,240
um in in terms of scale one was in the

125
00:05:20,310 --> 00:05:18,240
the same place but today was a different

126
00:05:22,790 --> 00:05:20,320
signature

127
00:05:25,510 --> 00:05:22,800
and we we understood the engine issue so

128
00:05:27,029 --> 00:05:25,520
we were confident coming into today but

129
00:05:28,950 --> 00:05:27,039
as the administrator said we're not

130
00:05:30,230 --> 00:05:28,960
going to launch till we're ready which

131
00:05:31,430 --> 00:05:30,240
means we're going to step through these

132
00:05:33,990 --> 00:05:31,440
things

133
00:05:35,270 --> 00:05:34,000
there's a lot of conjecture already uh i

134
00:05:37,270 --> 00:05:35,280
i can assure you i don't know how many

135
00:05:40,390 --> 00:05:37,280
people are in that mmt room today mike

136
00:05:42,070 --> 00:05:40,400
but i don't know 100 100 plus folks most

137
00:05:43,510 --> 00:05:42,080
of them engineers everybody already

138
00:05:45,990 --> 00:05:43,520

thinking about what is the problem and

139
00:05:47,430 --> 00:05:46,000
frankly that's what happens on the loops

140
00:05:51,510 --> 00:05:47,440
when we're

141
00:05:53,670 --> 00:05:51,520
folks are giving options

142
00:05:55,830 --> 00:05:53,680
the anomaly loops are really active

143
00:05:57,590 --> 00:05:55,840
especially on this one today from from

144
00:05:59,749 --> 00:05:57,600
the time we first saw the signature all

145
00:06:01,990 --> 00:05:59,759
the way until charlie made the right

146
00:06:04,150 --> 00:06:02,000
decision which was to scrub

147
00:06:06,390 --> 00:06:04,160
so our confidence comes through what

148
00:06:08,629 --> 00:06:06,400
we're going to learn in this when we're

149
00:06:10,629 --> 00:06:08,639
ready to go back out there we'll go back

150
00:06:12,790 --> 00:06:10,639
out there and try for another

151
00:06:15,510 --> 00:06:12,800
launch michael i'll lay out for you what

152
00:06:17,830 --> 00:06:15,520
we uh what we have in in between uh i'll

153
00:06:19,830 --> 00:06:17,840
i'll say this obviously we've talked

154
00:06:22,150 --> 00:06:19,840
about this mission being risky but we're

155
00:06:23,830 --> 00:06:22,160
going to take the risks that make sense

156
00:06:25,990 --> 00:06:23,840
the risk that we know that have already

157
00:06:28,150 --> 00:06:26,000
pushed the vehicle and the system as far

158
00:06:30,390 --> 00:06:28,160
as it will uh when we launch

159
00:06:31,990 --> 00:06:30,400
and uh and be ready to go at that time

160
00:06:35,029 --> 00:06:32,000
so with that let me turn over to mike

161
00:06:36,950 --> 00:06:35,039
for some more specifics okay and uh good

162
00:06:38,870 --> 00:06:36,960
afternoon again thank you for continuing

163
00:06:39,990 --> 00:06:38,880

to follow the artemis one mission in our

164
00:06:42,870 --> 00:06:40,000
program

165
00:06:45,909 --> 00:06:42,880
i'll just briefly recap where we left

166
00:06:48,390 --> 00:06:45,919
off the last time we were here which was

167
00:06:51,270 --> 00:06:48,400
after the launch -2 mission management

168
00:06:52,710 --> 00:06:51,280
team meeting on the first to review our

169
00:06:53,589 --> 00:06:52,720
readiness to head into this launch

170
00:06:55,189 --> 00:06:53,599
attempt

171
00:06:56,790 --> 00:06:55,199
if you recall the

172
00:06:58,309 --> 00:06:56,800
launch operations team out of the launch

173
00:06:59,350 --> 00:06:58,319
control center stayed in the launch

174
00:07:01,990 --> 00:06:59,360
countdown

175
00:07:03,990 --> 00:07:02,000
following the attempt on monday and that

176
00:07:05,270 --> 00:07:04,000
gave us a head start headed into today's

177
00:07:05,990 --> 00:07:05,280
attempt

178
00:07:21,510 --> 00:07:06,000
the

179
00:07:23,510 --> 00:07:21,520
and it was a clean meeting we met at 0 4

180
00:07:25,430 --> 00:07:23,520
45 this morning

181
00:07:26,230 --> 00:07:25,440
and we talked about our setup for the

182
00:07:28,070 --> 00:07:26,240
day

183
00:07:29,990 --> 00:07:28,080
and there were a few

184
00:07:31,510 --> 00:07:30,000
excuse me there were a few items that we

185
00:07:33,670 --> 00:07:31,520
talked about uh

186
00:07:34,790 --> 00:07:33,680
but most of those were

187
00:07:36,070 --> 00:07:34,800
of no

188
00:07:38,150 --> 00:07:36,080

particular

189
00:07:40,150 --> 00:07:38,160
constraint relative to

190
00:07:43,270 --> 00:07:40,160
setting up for our launch attempt

191
00:07:45,110 --> 00:07:43,280
the team identified that they had 46

192
00:07:47,430 --> 00:07:45,120
collision avoidance cutouts in the in

193
00:07:48,469 --> 00:07:47,440
the launch window most were a minute uh

194
00:07:50,150 --> 00:07:48,479
or or

195
00:07:52,790 --> 00:07:50,160
i'm sorry most for just a few seconds

196
00:07:54,869 --> 00:07:52,800
the longest ones were about a minute

197
00:07:57,350 --> 00:07:54,879
we do have uh

198
00:07:58,869 --> 00:07:57,360
at this particular time of year

199
00:08:00,869 --> 00:07:58,879
a high

200
00:08:02,790 --> 00:08:00,879
propellant bulk temperature

201
00:08:05,189 --> 00:08:02,800
which gives us more performance out of

202
00:08:08,469 --> 00:08:05,199
the rocket so essentially we have a hot

203
00:08:10,869 --> 00:08:08,479
rocket in terms of the performance

204
00:08:12,950 --> 00:08:10,879
to launch and that actually as we fly

205
00:08:15,270 --> 00:08:12,960
through the earth's atmosphere pushes

206
00:08:16,790 --> 00:08:15,280
the higher end of the maximum dynamic

207
00:08:19,270 --> 00:08:16,800
pressure or q-bar

208
00:08:20,309 --> 00:08:19,280
and we saw that we had positive margins

209
00:08:22,550 --> 00:08:20,319
but

210
00:08:23,990 --> 00:08:22,560
lower margins on one specific area on

211
00:08:26,070 --> 00:08:24,000
the orion spacecraft and we were

212
00:08:28,230 --> 00:08:26,080
watching that the vehicle was expected

213
00:08:30,629 --> 00:08:28,240

to get to about 700 pounds per square

214
00:08:31,350 --> 00:08:30,639
foot of pressure as it headed up through

215
00:08:40,870 --> 00:08:31,360
the

216
00:08:41,990 --> 00:08:40,880
through a chill down

217
00:08:42,949 --> 00:08:42,000
and

218
00:08:48,470 --> 00:08:42,959
the

219
00:08:50,070 --> 00:08:48,480
line

220
00:08:52,310 --> 00:08:50,080
that the pressure

221
00:08:54,470 --> 00:08:52,320
exceeded what we what we had planned

222
00:08:57,030 --> 00:08:54,480
which was about 20 pounds per square

223
00:08:58,310 --> 00:08:57,040
inch it got up to about 60 pounds per

224
00:09:01,110 --> 00:08:58,320
square inch

225
00:09:04,550 --> 00:09:01,120
and the flight hardware itself we know

226
00:09:07,030 --> 00:09:04,560
is is fine we did not exceed the

227
00:09:09,750 --> 00:09:07,040
maximum design pressure

228
00:09:11,110 --> 00:09:09,760
but there's a chance that the that the

229
00:09:12,630 --> 00:09:11,120
soft goods or the

230
00:09:14,150 --> 00:09:12,640
the seal

231
00:09:16,470 --> 00:09:14,160
in the quick disconnect at the eight

232
00:09:18,470 --> 00:09:16,480
inch quick disconnect

233
00:09:19,750 --> 00:09:18,480
saw some effects from that but it's too

234
00:09:21,990 --> 00:09:19,760
early to tell

235
00:09:24,389 --> 00:09:22,000
exactly whether that was the cause of

236
00:09:26,790 --> 00:09:24,399
the the hydrogen leak that we had today

237
00:09:29,190 --> 00:09:26,800
what we do know is that we saw a large

238
00:09:30,870 --> 00:09:29,200

leak at the eight inch quick disconnect

239
00:09:31,750 --> 00:09:30,880
today and

240
00:09:33,030 --> 00:09:31,760
that

241
00:09:35,430 --> 00:09:33,040
leak started

242
00:09:37,030 --> 00:09:35,440
when we went from the slow fill to the

243
00:09:39,110 --> 00:09:37,040
fast fill

244
00:09:40,470 --> 00:09:39,120
this particular quick disconnect did not

245
00:09:42,870 --> 00:09:40,480
have a problem

246
00:09:45,110 --> 00:09:42,880
uh of this magnitude on monday we did

247
00:09:48,150 --> 00:09:45,120
see a small leak but we did not see one

248
00:09:50,870 --> 00:09:48,160
of this magnitude it was it was

249
00:09:52,790 --> 00:09:50,880
characterized as a large leak by our

250
00:09:55,829 --> 00:09:52,800
buyer operations team

251
00:09:58,470 --> 00:09:55,839
the team tried three times to resolve

252
00:10:00,310 --> 00:09:58,480
the leak and all three times we saw a

253
00:10:03,110 --> 00:10:00,320
large leak

254
00:10:04,790 --> 00:10:03,120
and and as was discussed previously if

255
00:10:06,630 --> 00:10:04,800
if you can thermally stabilize both

256
00:10:08,630 --> 00:10:06,640
sides of that quick disconnect we have a

257
00:10:10,710 --> 00:10:08,640
ground side and a flight side

258
00:10:13,269 --> 00:10:10,720
and that is where the fluid flow occurs

259
00:10:15,750 --> 00:10:13,279
through if you can chill that down and

260
00:10:17,829 --> 00:10:15,760
ensure that there's no differential

261
00:10:19,910 --> 00:10:17,839
temperature across that interface

262
00:10:21,990 --> 00:10:19,920
sometimes the leaks conceal themselves

263
00:10:24,710 --> 00:10:22,000

or or heal themselves so the team

264
00:10:27,990 --> 00:10:24,720
attempted that they attempted to

265
00:10:30,150 --> 00:10:28,000
essentially reseat the leak by by

266
00:10:31,430 --> 00:10:30,160
increasing the pressure in there and and

267
00:10:32,470 --> 00:10:31,440
that was

268
00:10:34,550 --> 00:10:32,480
was

269
00:10:36,550 --> 00:10:34,560
not successful

270
00:10:40,870 --> 00:10:36,560
so initially the team

271
00:10:43,190 --> 00:10:40,880
declared the scrub at 11 17 eastern time

272
00:10:45,190 --> 00:10:43,200
and then went into vehicle safing and

273
00:10:47,190 --> 00:10:45,200
and drained the kryl

274
00:10:48,550 --> 00:10:47,200
the liquid oxygen is currently off the

275
00:10:50,069 --> 00:10:48,560
vehicle and

276
00:10:51,110 --> 00:10:50,079
the liquid hydrogen at least when we

277
00:10:52,470 --> 00:10:51,120
were in the mission management team

278
00:10:53,750 --> 00:10:52,480
meeting was still on board the vehicle

279
00:10:56,389 --> 00:10:53,760
and they were in the process of draining

280
00:10:58,310 --> 00:10:56,399
it it should be off by now or very close

281
00:11:01,350 --> 00:10:58,320
to it the team will get into what they

282
00:11:03,269 --> 00:11:01,360
call the inerting which is they put

283
00:11:06,069 --> 00:11:03,279
gaseous nitrogen in there

284
00:11:08,630 --> 00:11:06,079
so as not to condense water vapor

285
00:11:10,790 --> 00:11:08,640
in the in the tank area and then uh

286
00:11:12,710 --> 00:11:10,800
they'll they'll swap over to air what

287
00:11:15,110 --> 00:11:12,720
that does is it allows us to get the

288
00:11:18,230 --> 00:11:15,120

tanks back up to ambient uh conditions

289
00:11:21,509 --> 00:11:18,240
and then for us to gain access

290
00:11:22,710 --> 00:11:21,519
in the uh scrub meeting that we had it

291
00:11:25,030 --> 00:11:22,720
at

292
00:11:27,269 --> 00:11:25,040
2 30 eastern

293
00:11:29,509 --> 00:11:27,279
we talked about three options the first

294
00:11:31,750 --> 00:11:29,519
option was to

295
00:11:34,790 --> 00:11:31,760
simply demate and remake the umbilical

296
00:11:37,430 --> 00:11:34,800
at the pad hoping that the

297
00:11:39,269 --> 00:11:37,440
soft goods would seal the leak up but

298
00:11:40,870 --> 00:11:39,279
our confidence level given

299
00:11:43,030 --> 00:11:40,880
the size of the leak that we saw today

300
00:11:44,310 --> 00:11:43,040
was fairly low that that would solve the

301
00:11:45,910 --> 00:11:44,320
problem

302
00:11:49,030 --> 00:11:45,920
the team

303
00:11:50,150 --> 00:11:49,040
leaned towards a

304
00:12:07,829 --> 00:11:50,160
a

305
00:12:10,069 --> 00:12:07,839
which expires on the 6th

306
00:12:11,509 --> 00:12:10,079
so the team is developing a series of

307
00:12:13,350 --> 00:12:11,519
schedule options and we're going to hear

308
00:12:15,829 --> 00:12:13,360
about those early next week

309
00:12:18,629 --> 00:12:15,839
the schedule options include

310
00:12:20,069 --> 00:12:18,639
removal and replacement of the

311
00:12:21,670 --> 00:12:20,079
the soft goods on the on the quick

312
00:12:23,590 --> 00:12:21,680
disconnect at the pad

313
00:12:25,509 --> 00:12:23,600

followed by a

314
00:12:27,750 --> 00:12:25,519
cryotest that is the only place we can

315
00:12:30,069 --> 00:12:27,760
get a full cryo test to ensure that we

316
00:12:31,590 --> 00:12:30,079
do not have

317
00:12:47,990 --> 00:12:31,600
the

318
00:12:49,910 --> 00:12:48,000
quick disconnect

319
00:12:50,949 --> 00:12:49,920
soft goods in the vehicle assembly

320
00:12:52,629 --> 00:12:50,959
building

321
00:12:53,910 --> 00:12:52,639
there's a risk versus risk trade doing

322
00:12:55,269 --> 00:12:53,920
it at the pad you're exposed to the

323
00:12:57,269 --> 00:12:55,279
environmental conditions and we need to

324
00:12:58,790 --> 00:12:57,279
build an environmental enclosure

325
00:13:00,389 --> 00:12:58,800
to do that we do it in the vehicle

326
00:13:03,030 --> 00:13:00,399
assembly building the vehicle assembly

327
00:13:04,710 --> 00:13:03,040
building is the environmental enclosure

328
00:13:08,470 --> 00:13:04,720
however we cannot

329
00:13:10,150 --> 00:13:08,480
test this quick disconnect at in the vab

330
00:13:12,069 --> 00:13:10,160
at cryogenic temperatures we can only do

331
00:13:14,150 --> 00:13:12,079
it at ambient temperatures so

332
00:13:15,269 --> 00:13:14,160
we're working through those options uh

333
00:13:16,870 --> 00:13:15,279
the team

334
00:13:18,550 --> 00:13:16,880
it's it's too early to say but they're

335
00:13:20,550 --> 00:13:18,560
working through a fault tree analysis as

336
00:13:24,230 --> 00:13:20,560
to why we did not see a leak of this

337
00:13:27,030 --> 00:13:24,240
magnitude on monday but we're seeing it

338
00:13:29,350 --> 00:13:27,040

of this magnitude at today's attempt and

339
00:13:30,790 --> 00:13:29,360
they're also looking at the chill down

340
00:13:33,110 --> 00:13:30,800
procedure

341
00:13:35,190 --> 00:13:33,120
to look at additional

342
00:13:36,710 --> 00:13:35,200
controls such that we don't have a

343
00:13:37,910 --> 00:13:36,720
reoccurrence of the

344
00:13:39,350 --> 00:13:37,920
of the

345
00:13:41,030 --> 00:13:39,360
inadvertent over pressure that we had

346
00:13:42,310 --> 00:13:41,040
earlier today so

347
00:13:43,829 --> 00:13:42,320
all that said

348
00:13:45,750 --> 00:13:43,839
we've talked about it before this is an

349
00:13:48,389 --> 00:13:45,760
incredibly hard business this is an

350
00:13:51,110 --> 00:13:48,399
initial test flight of this vehicle as

351
00:13:52,710 --> 00:13:51,120
was said by administrator nelson we're

352
00:13:53,509 --> 00:13:52,720
going to fly when we're ready

353
00:13:55,590 --> 00:13:53,519
and

354
00:13:56,949 --> 00:13:55,600
as part of this initial test flight

355
00:13:58,550 --> 00:13:56,959
we're learning the vehicle we're

356
00:14:01,030 --> 00:13:58,560
learning how to operate the vehicle and

357
00:14:03,670 --> 00:14:01,040
we are learning

358
00:14:06,629 --> 00:14:03,680
all of the things required to get us

359
00:14:08,629 --> 00:14:06,639
ready to fly and we've demonstrated a

360
00:14:10,629 --> 00:14:08,639
large number of those things

361
00:14:13,030 --> 00:14:10,639
not only through wet dress and some of

362
00:14:13,750 --> 00:14:13,040
the other ground tests that we've had

363
00:14:16,230 --> 00:14:13,760

but

364
00:14:18,069 --> 00:14:16,240
we we are still learning as we go again

365
00:14:19,750 --> 00:14:18,079
to get this vehicle off safely so our

366
00:14:21,590 --> 00:14:19,760
focus is on

367
00:14:23,829 --> 00:14:21,600
understanding the problem

368
00:14:26,150 --> 00:14:23,839
developing solutions uh in terms of

369
00:14:28,230 --> 00:14:26,160
schedule but also risk versus risk

370
00:14:30,629 --> 00:14:28,240
impacts and we'll follow up

371
00:14:32,550 --> 00:14:30,639
next week when we when we have those

372
00:14:34,790 --> 00:14:32,560
options uh fleshed out further so with

373
00:14:35,670 --> 00:14:34,800
that i'll pass it back to jackie thanks

374
00:14:37,350 --> 00:14:35,680
mike

375
00:14:39,990 --> 00:14:37,360
so now we'll open it up for questions in

376
00:14:42,310 --> 00:14:40,000
the room and also on the phones on the

377
00:14:44,230 --> 00:14:42,320
phones as a reminder press star one to

378
00:14:46,230 --> 00:14:44,240
get into the queue and in the room if

379
00:14:48,470 --> 00:14:46,240
you could leave your hand high for the

380
00:14:49,590 --> 00:14:48,480
mic folks to come get you after you ask

381
00:14:56,389 --> 00:14:49,600
your question

382
00:15:00,230 --> 00:14:58,790
a question for mike if you decide to

383
00:15:02,069 --> 00:15:00,240
roll back and i know you know it's

384
00:15:04,949 --> 00:15:02,079
uncertain right now um what's the

385
00:15:06,870 --> 00:15:04,959
quickest you could roll sls back out to

386
00:15:07,910 --> 00:15:06,880
the pad what would that look like and

387
00:15:10,150 --> 00:15:07,920
what other things would you have to do

388
00:15:12,150 --> 00:15:10,160

in the vab while it's there

389
00:15:13,829 --> 00:15:12,160
we're looking at several weeks to do

390
00:15:16,310 --> 00:15:13,839
that

391
00:15:18,470 --> 00:15:16,320
depending on the

392
00:15:19,750 --> 00:15:18,480
required work at the pad or whether we

393
00:15:21,750 --> 00:15:19,760
do it in the vehicle assembly building

394
00:15:23,350 --> 00:15:21,760
that'll determine the exact the exact

395
00:15:24,870 --> 00:15:23,360
schedule but it's it's several weeks of

396
00:15:28,310 --> 00:15:24,880
work it's really too early to say

397
00:15:36,150 --> 00:15:29,990
thanks and up next on the phones we have

398
00:15:41,670 --> 00:15:39,110
yes hi can you hear me we can hear you

399
00:15:44,470 --> 00:15:41,680
yes um yes

400
00:15:46,470 --> 00:15:44,480
uh i was wondering so are you saying uh

401
00:15:48,949 --> 00:15:46,480
if you do the repairs at the pad and it

402
00:15:51,670 --> 00:15:48,959
seems to go well you could shoot

403
00:15:53,189 --> 00:15:51,680
still maybe get off in september

404
00:15:54,550 --> 00:15:53,199
uh by the end of the month before the

405
00:15:55,910 --> 00:15:54,560
spacex

406
00:15:58,069 --> 00:15:55,920
launch coming up at the beginning of

407
00:16:01,829 --> 00:15:58,079
october is that a possibility

408
00:16:03,030 --> 00:16:01,839
and the way things stand right now um

409
00:16:05,670 --> 00:16:03,040
which way do you think you're leaning

410
00:16:07,990 --> 00:16:05,680
for thanks

411
00:16:10,389 --> 00:16:08,000
i'll just take the first part of that uh

412
00:16:11,670 --> 00:16:10,399
you know i think we we still have our uh

413
00:16:14,230 --> 00:16:11,680

constraint

414
00:16:16,629 --> 00:16:14,240
on the range with the range to test our

415
00:16:18,550 --> 00:16:16,639
flight termination system which is right

416
00:16:20,470 --> 00:16:18,560
now we have 25 days you know i think

417
00:16:22,389 --> 00:16:20,480
we're going to talk with the range about

418
00:16:25,590 --> 00:16:22,399
what the possibilities are

419
00:16:27,110 --> 00:16:25,600
but uh we you know in order to to test

420
00:16:29,269 --> 00:16:27,120
our batteries change out the batteries

421
00:16:30,150 --> 00:16:29,279
we have to we have to roll back uh for

422
00:16:32,310 --> 00:16:30,160
that

423
00:16:34,790 --> 00:16:32,320
and i'll let you handle the options yeah

424
00:16:37,030 --> 00:16:34,800
and and marshall with respect to uh

425
00:16:38,629 --> 00:16:37,040
whether or not september

426
00:16:40,310 --> 00:16:38,639
the the latter part of september is

427
00:16:42,310 --> 00:16:40,320
still in the trade space again i think

428
00:16:44,069 --> 00:16:42,320
it's too early to tell it really

429
00:16:46,550 --> 00:16:44,079
comes down to what is what does the

430
00:16:49,590 --> 00:16:46,560
fault tree analysis tell us and what are

431
00:16:52,310 --> 00:16:49,600
the necessary changes in mitigations

432
00:16:54,069 --> 00:16:52,320
required uh in order to

433
00:16:56,470 --> 00:16:54,079
in order to have a confidence that we've

434
00:16:58,949 --> 00:16:56,480
resolved this large leak at the eight

435
00:17:01,030 --> 00:16:58,959
inch quick disconnect so i i think we'll

436
00:17:02,389 --> 00:17:01,040
have a much better answer early next

437
00:17:04,710 --> 00:17:02,399
week and right now it's just too early

438
00:17:06,630 --> 00:17:04,720

to tell

439
00:17:10,470 --> 00:17:06,640
thank you next we have tom costello with

440
00:17:14,150 --> 00:17:12,789
uh hi good afternoon can i just clarify

441
00:17:16,230 --> 00:17:14,160
you said that the

442
00:17:18,309 --> 00:17:16,240
the line had been over pressurized up to

443
00:17:21,189 --> 00:17:18,319
60 psi do you believe that that over

444
00:17:23,270 --> 00:17:21,199
pressurization potentially caused the

445
00:17:25,189 --> 00:17:23,280
leak that then you were dealing with all

446
00:17:26,789 --> 00:17:25,199
day today and any idea how that line was

447
00:17:29,190 --> 00:17:26,799
over pressurized

448
00:17:31,510 --> 00:17:29,200
yeah i guess what i'd say is i think

449
00:17:33,750 --> 00:17:31,520
mike talked about the fault tree

450
00:17:36,549 --> 00:17:33,760
we we have to go look at

451
00:17:38,549 --> 00:17:36,559
is that a cause is that the cause i'm

452
00:17:40,549 --> 00:17:38,559
sure it'll end up on the fault tree but

453
00:17:42,150 --> 00:17:40,559
we have to run through all legs of that

454
00:17:43,590 --> 00:17:42,160
fall tree before we decide that's

455
00:17:47,590 --> 00:17:43,600
absolutely

456
00:17:49,990 --> 00:17:47,600
we we do

457
00:17:52,470 --> 00:17:50,000
i think i forget how the words that you

458
00:17:55,029 --> 00:17:52,480
use the last one we kind of tune in this

459
00:17:57,350 --> 00:17:55,039
this hydrogen we did that on monday you

460
00:17:59,190 --> 00:17:57,360
know monday we saw it it started to go

461
00:18:00,630 --> 00:17:59,200
up and we slowed the rate and did a

462
00:18:01,590 --> 00:18:00,640
manual fill

463
00:18:03,830 --> 00:18:01,600

um

464
00:18:05,990 --> 00:18:03,840
that's just part of the process and and

465
00:18:07,270 --> 00:18:06,000
we we need to look as mike said to to

466
00:18:10,230 --> 00:18:07,280
automate that

467
00:18:12,549 --> 00:18:10,240
um and and get the places where it'll

468
00:18:14,789 --> 00:18:12,559
cut out if if the pressure is

469
00:18:17,029 --> 00:18:14,799
is going too high so we don't we don't

470
00:18:19,029 --> 00:18:17,039
hit that kind of command again

471
00:18:21,270 --> 00:18:19,039
that'll be part of what we we automate

472
00:18:23,830 --> 00:18:21,280
and and practice for the for the next

473
00:18:25,669 --> 00:18:23,840
time but it's on the fall tree uh it's

474
00:18:28,630 --> 00:18:25,679
kind of tough to say right now yeah that

475
00:18:31,830 --> 00:18:28,640
is the absolute cause

476
00:18:35,430 --> 00:18:31,840
chris davenport washington post

477
00:18:39,510 --> 00:18:37,510
thank you i just want to clarify you're

478
00:18:41,110 --> 00:18:39,520
going back to the vab

479
00:18:42,630 --> 00:18:41,120
no matter what right i just want to

480
00:18:44,070 --> 00:18:42,640
clarify that and i wonder if you could

481
00:18:45,270 --> 00:18:44,080
just briefly mike talk about the

482
00:18:48,310 --> 00:18:45,280
differences

483
00:18:49,990 --> 00:18:48,320
with this uh hydrogen leak this big one

484
00:18:54,630 --> 00:18:50,000
that you had versus the one that you

485
00:18:58,470 --> 00:18:56,710
yeah for the vab part of it it's what i

486
00:18:59,990 --> 00:18:58,480
said we we have to go back right now we

487
00:19:02,230 --> 00:19:00,000
don't do not have an agreement with a

488
00:19:05,750 --> 00:19:02,240

range that we can launch when our

489
00:19:06,789 --> 00:19:05,760
batteries have not been tested after 25

490
00:19:09,190 --> 00:19:06,799
days

491
00:19:11,029 --> 00:19:09,200
um so that that runs out here as mike

492
00:19:12,710 --> 00:19:11,039
said and

493
00:19:14,070 --> 00:19:12,720
so in order to change them out we have

494
00:19:15,669 --> 00:19:14,080
to go back

495
00:19:17,430 --> 00:19:15,679
to get that kind of extension with the

496
00:19:19,909 --> 00:19:17,440
range is something we'd have to talk to

497
00:19:22,630 --> 00:19:19,919
them about so right now our position is

498
00:19:24,230 --> 00:19:22,640
we will have to go back to the vab

499
00:19:26,470 --> 00:19:24,240
when we go back will depend on the

500
00:19:28,310 --> 00:19:26,480
testing options that mike talked about

501
00:19:30,870 --> 00:19:28,320
yeah and and to take a crack at the

502
00:19:32,310 --> 00:19:30,880
second part of your question there um

503
00:19:34,390 --> 00:19:32,320
chris um

504
00:19:35,430 --> 00:19:34,400
in terms of the leak that we saw on

505
00:19:38,390 --> 00:19:35,440
monday

506
00:19:40,150 --> 00:19:38,400
it would it was a manageable leak this

507
00:19:42,390 --> 00:19:40,160
was not a manageable leak

508
00:19:44,150 --> 00:19:42,400
as soon as we started uh to get into

509
00:19:45,909 --> 00:19:44,160
fast fill and and we need to get into

510
00:19:47,110 --> 00:19:45,919
fast fill again as part of this delicate

511
00:19:49,909 --> 00:19:47,120
balance of

512
00:19:55,430 --> 00:19:53,830
you you want to load uh within the

513
00:19:56,870 --> 00:19:55,440

within the capability of the quick

514
00:19:58,230 --> 00:19:56,880
disconnect

515
00:20:00,470 --> 00:19:58,240
which tells you you want to slow it down

516
00:20:01,990 --> 00:20:00,480
but you also want to speed it up so you

517
00:20:04,789 --> 00:20:02,000
can make your launch window so you've

518
00:20:06,710 --> 00:20:04,799
got this balance between the

519
00:20:07,750 --> 00:20:06,720
between the the flow rate and the

520
00:20:09,669 --> 00:20:07,760
pressure

521
00:20:11,190 --> 00:20:09,679
and if there's a leak present you need

522
00:20:12,710 --> 00:20:11,200
to manage that so

523
00:20:14,390 --> 00:20:12,720
on monday the team was able to

524
00:20:17,110 --> 00:20:14,400
successfully work their way through that

525
00:20:19,990 --> 00:20:17,120
while staying with below the hazardous

526
00:20:22,070 --> 00:20:20,000
concentration limit of the

527
00:20:23,830 --> 00:20:22,080
hydrogen that was leaking out we were

528
00:20:26,630 --> 00:20:23,840
unable to do that today there was a much

529
00:20:28,870 --> 00:20:26,640
larger leak the team tried to work and

530
00:20:31,430 --> 00:20:28,880
use the same technique as part of a

531
00:20:33,350 --> 00:20:31,440
pre-planned procedure

532
00:20:36,070 --> 00:20:33,360
they tried multiple times and and that

533
00:20:38,870 --> 00:20:36,080
didn't work in addition to trying to uh

534
00:20:40,630 --> 00:20:38,880
to bump the um the quick disconnect and

535
00:20:42,870 --> 00:20:40,640
try to reseed it and and then none of

536
00:20:45,110 --> 00:20:42,880
those techniques worked um

537
00:20:48,230 --> 00:20:45,120
the techniques that we used on monday

538
00:20:51,510 --> 00:20:48,240

just for this magnitude of leak we're

539
00:21:01,510 --> 00:20:52,950
thanks mike

540
00:21:04,149 --> 00:21:02,470
thank you

541
00:21:06,630 --> 00:21:04,159
uh just wondering if there is a

542
00:21:08,310 --> 00:21:06,640
precedent uh for getting an extension

543
00:21:10,630 --> 00:21:08,320
with the range on something like this

544
00:21:12,549 --> 00:21:10,640
has that ever been done before or

545
00:21:14,950 --> 00:21:12,559
uh if you all were to ask the range for

546
00:21:16,710 --> 00:21:14,960
that to allow the the vehicle to stay on

547
00:21:18,549 --> 00:21:16,720
the launch pad before next attempt would

548
00:21:20,230 --> 00:21:18,559
that be something that's that hasn't

549
00:21:22,310 --> 00:21:20,240
been done before

550
00:21:25,430 --> 00:21:22,320
we we work with them just recently to go

551
00:21:27,029 --> 00:21:25,440
from 20 to 25 days uh showing them a lot

552
00:21:29,990 --> 00:21:27,039
of the technical data that they needed

553
00:21:32,149 --> 00:21:30,000
to see about the integrity of our system

554
00:21:33,750 --> 00:21:32,159
so i'm i'm confident there's probably

555
00:21:35,590 --> 00:21:33,760
been other ones i can't quote the

556
00:21:37,350 --> 00:21:35,600
history but i can tell you that we just

557
00:21:39,029 --> 00:21:37,360
negotiated with them to go from 20 to

558
00:21:40,630 --> 00:21:39,039
25.

559
00:21:42,070 --> 00:21:40,640
do you feel at least somewhat confident

560
00:21:45,510 --> 00:21:42,080
that there's a chance

561
00:21:47,909 --> 00:21:45,520
um that perhaps this rocket could stay

562
00:21:49,830 --> 00:21:47,919
on the pad before next launch attempt

563
00:21:52,230 --> 00:21:49,840

um well that's

564
00:21:54,549 --> 00:21:52,240
i mean my conjecture is i don't know

565
00:21:55,669 --> 00:21:54,559
because uh it's it's really it's really

566
00:21:57,750 --> 00:21:55,679
their call

567
00:21:59,669 --> 00:21:57,760
and i think we have data that probably

568
00:22:01,190 --> 00:21:59,679
supports it and i know i know our folks

569
00:22:03,110 --> 00:22:01,200
are going to go talk to the range as

570
00:22:05,270 --> 00:22:03,120
soon as they're able to but that's

571
00:22:07,110 --> 00:22:05,280
really uh you know that's serious

572
00:22:09,190 --> 00:22:07,120
business that they deal with and we deal

573
00:22:10,470 --> 00:22:09,200
with and we want to respect

574
00:22:13,830 --> 00:22:10,480
that this is their range and we're

575
00:22:19,110 --> 00:22:13,840
launching from it

576
00:22:21,909 --> 00:22:20,630
hi lauren gresh with bloomberg i'm

577
00:22:24,470 --> 00:22:21,919
wondering if you can walk us through

578
00:22:27,350 --> 00:22:24,480
exactly what hardware you need to be

579
00:22:31,830 --> 00:22:27,360
replacing exactly where it is and how

580
00:22:35,110 --> 00:22:34,070
yeah lawrence i'll take a crack at that

581
00:22:36,950 --> 00:22:35,120
um

582
00:22:40,710 --> 00:22:36,960
right now we're focused on the the eight

583
00:22:42,710 --> 00:22:40,720
inch quick disconnect and simply the the

584
00:22:45,029 --> 00:22:42,720
soft goods the the

585
00:22:46,230 --> 00:22:45,039
seal that surrounds it

586
00:22:48,870 --> 00:22:46,240
we need to get through the fault tree

587
00:22:50,950 --> 00:22:48,880
analysis to figure out exactly uh if

588
00:22:52,789 --> 00:22:50,960

there's if there's anything else that

589
00:22:55,350 --> 00:22:52,799
needs to be accounted for it's a little

590
00:22:56,710 --> 00:22:55,360
too early to tell exactly again

591
00:22:59,830 --> 00:22:56,720
as to what

592
00:23:01,669 --> 00:22:59,840
uh else may be in play what other work

593
00:23:02,470 --> 00:23:01,679
uh may be necessary so there's there's

594
00:23:05,270 --> 00:23:02,480
the

595
00:23:07,510 --> 00:23:05,280
kind of your your engineering review

596
00:23:09,270 --> 00:23:07,520
board or or technical analysis that will

597
00:23:11,590 --> 00:23:09,280
happen in the office environment and

598
00:23:13,750 --> 00:23:11,600
then we'll go out and we'll demate the

599
00:23:15,270 --> 00:23:13,760
umbilical whether it's at the pad or in

600
00:23:15,990 --> 00:23:15,280
the vehicle assembly building depending

601
00:23:17,510 --> 00:23:16,000
on

602
00:23:18,549 --> 00:23:17,520
what the what the team brings forward

603
00:23:20,950 --> 00:23:18,559
next week

604
00:23:22,630 --> 00:23:20,960
and we'll put those two together and

605
00:23:24,390 --> 00:23:22,640
decide what are the things that we can

606
00:23:26,630 --> 00:23:24,400
resolve based on the data that we

607
00:23:28,310 --> 00:23:26,640
already have from the fall tree analysis

608
00:23:29,750 --> 00:23:28,320
and say we don't need to check these

609
00:23:30,950 --> 00:23:29,760
things or we absolutely need to check

610
00:23:33,029 --> 00:23:30,960
these things

611
00:23:35,350 --> 00:23:33,039
and then

612
00:23:37,750 --> 00:23:35,360
we will also have some witness

613
00:23:39,990 --> 00:23:37,760

information when we when we demate the

614
00:23:41,750 --> 00:23:40,000
umbilical we're being very thoughtful

615
00:23:44,230 --> 00:23:41,760
about demanding the umbilical at this

616
00:23:46,630 --> 00:23:44,240
point because we also don't want to

617
00:23:48,630 --> 00:23:46,640
disturb what may be

618
00:23:51,830 --> 00:23:48,640
critical engineering data is part of

619
00:23:52,630 --> 00:23:51,840
that so before we we proceed into

620
00:23:54,070 --> 00:23:52,640
um

621
00:23:57,510 --> 00:23:54,080
a simple

622
00:23:59,350 --> 00:23:57,520
and replacement of this quick disconnect

623
00:24:00,549 --> 00:23:59,360
seal we want to make sure that we're not

624
00:24:02,549 --> 00:24:00,559
overlooking something so we're going to

625
00:24:04,470 --> 00:24:02,559
take some time to go through this from

626
00:24:06,549 --> 00:24:04,480
uh from an engineering standpoint

627
00:24:08,710 --> 00:24:06,559
go through any potential cause or

628
00:24:11,190 --> 00:24:08,720
exclude any potential cause based on the

629
00:24:13,990 --> 00:24:11,200
information we had so it's again it's a

630
00:24:18,390 --> 00:24:14,000
little too early to tell exactly where

631
00:24:18,400 --> 00:24:24,230
thank you eric berger with ars technica

632
00:24:29,110 --> 00:24:26,230
uh two quick ones about the hydrogen

633
00:24:30,630 --> 00:24:29,120
first of all um maybe mike if i was

634
00:24:33,269 --> 00:24:30,640
staying there with a bucket and some

635
00:24:34,549 --> 00:24:33,279
cryogenic proof gloves like how quickly

636
00:24:37,029 --> 00:24:34,559
would it fill the bucket just want to

637
00:24:39,110 --> 00:24:37,039
sort of get a sense of the magnitude of

638
00:24:40,870 --> 00:24:39,120

the leak you've called it a large leak

639
00:24:42,870 --> 00:24:40,880
and then for senator nelson you know

640
00:24:44,390 --> 00:24:42,880
when you were writing the authorization

641
00:24:46,149 --> 00:24:44,400
bill in 2010

642
00:24:47,350 --> 00:24:46,159
sort of setting up this base launch

643
00:24:48,549 --> 00:24:47,360
system

644
00:24:50,630 --> 00:24:48,559
did you have concerns about the

645
00:24:52,630 --> 00:24:50,640
continued use of hydrogen due to its

646
00:24:54,710 --> 00:24:52,640
leaky nature and your experience with it

647
00:24:58,630 --> 00:24:54,720
on shuttle thanks

648
00:25:00,870 --> 00:24:58,640
well i'll answer that right out uh i

649
00:25:04,310 --> 00:25:00,880
and along with senator k bailey

650
00:25:06,549 --> 00:25:04,320
hutchinson along with

651
00:25:08,549 --> 00:25:06,559
our folks in the white house

652
00:25:11,830 --> 00:25:08,559
uh deferred to

653
00:25:14,549 --> 00:25:11,840
the people who best knew the systems and

654
00:25:17,110 --> 00:25:14,559
so the answer your question is no

655
00:25:19,750 --> 00:25:17,120
we did not have

656
00:25:23,510 --> 00:25:19,760
any question about hydrogen we deferred

657
00:25:29,110 --> 00:25:25,350
yeah and eric to answer your your

658
00:25:31,350 --> 00:25:29,120
question about how large is the leak um

659
00:25:34,310 --> 00:25:31,360
i i i wouldn't use a bucket analogy on

660
00:25:37,029 --> 00:25:34,320
that one it it really is a concentration

661
00:25:37,990 --> 00:25:37,039
um you know when when you have

662
00:25:39,909 --> 00:25:38,000
a

663
00:25:42,710 --> 00:25:39,919

fuel source

664
00:25:45,269 --> 00:25:42,720
in atmospheric air that contains roughly

665
00:25:47,750 --> 00:25:45,279
20 oxygen

666
00:25:50,710 --> 00:25:47,760
when you mix the two all you need is an

667
00:25:51,990 --> 00:25:50,720
an ignition source to close the fire

668
00:25:53,669 --> 00:25:52,000
triangle so

669
00:25:56,470 --> 00:25:53,679
we know that when you get above roughly

670
00:25:59,430 --> 00:25:56,480
a four percent concentration of of

671
00:26:03,269 --> 00:25:59,440
hydrogen in ambient air you're at risk

672
00:26:06,789 --> 00:26:03,279
of having a flammability

673
00:26:09,430 --> 00:26:06,799
event or a flammability hazard we were

674
00:26:10,390 --> 00:26:09,440
seeing in excess of that

675
00:26:11,590 --> 00:26:10,400
by

676
00:26:13,190 --> 00:26:11,600
probably two or three orders of

677
00:26:15,269 --> 00:26:13,200
magnitude today so

678
00:26:16,870 --> 00:26:15,279
um i'm sorry not orders main two two or

679
00:26:19,269 --> 00:26:16,880
three times are our acceptable

680
00:26:20,230 --> 00:26:19,279
concentration limit um

681
00:26:21,990 --> 00:26:20,240
so

682
00:26:23,430 --> 00:26:22,000
it was pretty clear

683
00:26:25,350 --> 00:26:23,440
that we weren't going to be able to work

684
00:26:26,950 --> 00:26:25,360
our way through it like we did on monday

685
00:26:30,310 --> 00:26:26,960
in terms of

686
00:26:33,510 --> 00:26:30,320
the uh the managing of the leak uh every

687
00:26:35,990 --> 00:26:33,520
every time we saw the leak it was a

688
00:26:39,269 --> 00:26:36,000

large leak that immediately exceeded our

689
00:26:41,269 --> 00:26:39,279
flammability limits so

690
00:26:42,789 --> 00:26:41,279
you know again a couple of techniques

691
00:26:46,789 --> 00:26:42,799
were tried and we just couldn't get

692
00:26:50,549 --> 00:26:48,149
tariq with

693
00:26:54,789 --> 00:26:50,559
space.com

694
00:26:56,390 --> 00:26:54,799
uh from mike uh just to follow up on

695
00:26:58,149 --> 00:26:56,400
lauren's question about the nature of

696
00:27:00,070 --> 00:26:58,159
what has to be replaced you mentioned

697
00:27:03,190 --> 00:27:00,080
soft goods is that as simple as just a

698
00:27:04,870 --> 00:27:03,200
rubber seal is it silicone uh or is it

699
00:27:07,190 --> 00:27:04,880
more hardware that you do have to

700
00:27:08,950 --> 00:27:07,200
replace and and why would you need a an

701
00:27:13,909 --> 00:27:08,960
enclosure around it just to prevent

702
00:27:17,909 --> 00:27:13,919
corrosion then on that seal um thank you

703
00:27:24,789 --> 00:27:23,029
the quick disconnect it's it is a um

704
00:27:26,389 --> 00:27:24,799
it's a a metal

705
00:27:28,630 --> 00:27:26,399
um

706
00:27:31,350 --> 00:27:28,640
poppet like device

707
00:27:33,269 --> 00:27:31,360
and it has a gasket around it and i

708
00:27:36,070 --> 00:27:33,279
don't know the exact

709
00:27:36,950 --> 00:27:36,080
gasket material

710
00:27:39,909 --> 00:27:36,960
but

711
00:27:41,510 --> 00:27:39,919
if if we were to see damage on the quick

712
00:27:44,789 --> 00:27:41,520
disconnect that would tell us we would

713
00:27:47,830 --> 00:27:44,799

need to replace the hardware

714
00:27:49,110 --> 00:27:47,840
if we saw foreign object debris

715
00:27:50,950 --> 00:27:49,120
that would tell us

716
00:27:51,750 --> 00:27:50,960
that maybe we got something else going

717
00:27:55,510 --> 00:27:51,760
on

718
00:27:57,669 --> 00:27:55,520
gasket

719
00:28:00,149 --> 00:27:57,679
we've got spares we can

720
00:28:02,389 --> 00:28:00,159
quickly remove and replace that

721
00:28:04,070 --> 00:28:02,399
our history

722
00:28:05,830 --> 00:28:04,080
of our own testing at the launch

723
00:28:07,590 --> 00:28:05,840
equipment test facility which is which

724
00:28:10,710 --> 00:28:07,600
is right here resident at the kennedy

725
00:28:13,350 --> 00:28:10,720
space center tells us that

726
00:28:14,549 --> 00:28:13,360
a leak of this magnitude is typically

727
00:28:16,549 --> 00:28:14,559
resolved

728
00:28:18,470 --> 00:28:16,559
through a removal and replacement of the

729
00:28:20,470 --> 00:28:18,480
of the soft goods that seal

730
00:28:24,789 --> 00:28:20,480
and and that's kind of one of our

731
00:28:28,149 --> 00:28:26,470
but again we we need to go through the

732
00:28:29,350 --> 00:28:28,159
fault tree we need to inspect the

733
00:28:31,029 --> 00:28:29,360
hardware we need to see what the

734
00:28:31,909 --> 00:28:31,039
hardware is telling us

735
00:28:34,470 --> 00:28:31,919
so

736
00:28:37,669 --> 00:28:34,480
in terms of exactly what needs to be

737
00:28:39,029 --> 00:28:37,679
done it's it's too early to tell and i'm

738
00:28:40,230 --> 00:28:39,039

i'm sorry there was a second part to

739
00:28:43,190 --> 00:28:40,240
your question i don't recall what the

740
00:28:44,710 --> 00:28:43,200
second part was about the enclosure

741
00:28:45,990 --> 00:28:44,720
the enclosure yeah

742
00:28:48,310 --> 00:28:46,000
so

743
00:28:50,470 --> 00:28:48,320
the enclosure affords us

744
00:28:52,630 --> 00:28:50,480
the ability to

745
00:28:54,710 --> 00:28:52,640
provide what we call a purge at that

746
00:28:57,590 --> 00:28:54,720
interface and the purge

747
00:28:59,510 --> 00:28:57,600
allows us to push

748
00:29:01,350 --> 00:28:59,520
nitrogen in there to

749
00:29:03,510 --> 00:29:01,360
essentially inert or

750
00:29:06,310 --> 00:29:03,520
push out any oxygen in there so reduces

751
00:29:08,470 --> 00:29:06,320
the likelihood of a

752
00:29:10,870 --> 00:29:08,480
flammability hazard so if we were to

753
00:29:13,750 --> 00:29:10,880
just pump regular old air in there

754
00:29:16,870 --> 00:29:13,760
regular old air has oxygen in it and and

755
00:29:19,110 --> 00:29:16,880
we eliminate that oxygen by creating an

756
00:29:21,590 --> 00:29:19,120
enclosure and and putting nitrogen there

757
00:29:24,470 --> 00:29:21,600
in there to displace any oxygen such

758
00:29:26,389 --> 00:29:24,480
that if there is a hydrogen leak you've

759
00:29:30,230 --> 00:29:26,399
got one leg of the the fire triangle

760
00:29:34,149 --> 00:29:32,070
thanks now we'll go to a question from

761
00:29:37,110 --> 00:29:34,159
the phones we have rameen skiba from

762
00:29:42,070 --> 00:29:39,590
hi thank you um this is a question i

763
00:29:43,990 --> 00:29:42,080

think for mike um i was wondering what

764
00:29:45,909 --> 00:29:44,000
are the risks to the the cubesat

765
00:29:48,070 --> 00:29:45,919
secondary missions if if there's a

766
00:29:50,789 --> 00:29:48,080
significant delay like is is that a

767
00:29:52,950 --> 00:29:50,799
factor in determining um the the launch

768
00:29:54,389 --> 00:29:52,960
date um you know if some some of them

769
00:29:56,870 --> 00:29:54,399
cannot be recharged if the batteries

770
00:29:58,870 --> 00:29:56,880
cannot be recharged

771
00:30:01,590 --> 00:29:58,880
yeah that's a good question rameen

772
00:30:03,750 --> 00:30:01,600
we do maintain a um

773
00:30:05,830 --> 00:30:03,760
open communication loop with the

774
00:30:07,750 --> 00:30:05,840
with the cubesat customers so we will

775
00:30:10,389 --> 00:30:07,760
certainly inform them that

776
00:30:12,230 --> 00:30:10,399
we we did not

777
00:30:13,190 --> 00:30:12,240
have our our

778
00:30:16,549 --> 00:30:13,200
our

779
00:30:20,870 --> 00:30:16,559
next

780
00:30:23,110 --> 00:30:20,880
from a scheduled standpoint and we'll

781
00:30:25,110 --> 00:30:23,120
make a risk-based decision

782
00:30:26,710 --> 00:30:25,120
based on a whole host of factors you

783
00:30:28,630 --> 00:30:26,720
know if we do need to roll back to the

784
00:30:29,510 --> 00:30:28,640
vehicle assembly building we could top

785
00:30:31,830 --> 00:30:29,520
off

786
00:30:33,669 --> 00:30:31,840
the batteries for a number of those or

787
00:30:36,070 --> 00:30:33,679
they may not even need to be topped off

788
00:30:37,269 --> 00:30:36,080

based on what we what we believe to be

789
00:30:39,110 --> 00:30:37,279
the known

790
00:30:40,230 --> 00:30:39,120
battery decay rate and battery state of

791
00:30:41,830 --> 00:30:40,240
charge

792
00:30:43,110 --> 00:30:41,840
i i personally haven't seen all that

793
00:30:46,149 --> 00:30:43,120
data

794
00:30:48,470 --> 00:30:46,159
but it is part of the process of of

795
00:30:51,750 --> 00:30:48,480
looking at a given

796
00:30:53,350 --> 00:30:51,760
launch period and and we will uh share

797
00:30:54,630 --> 00:30:53,360
that information with our cubesat

798
00:30:56,870 --> 00:30:54,640
providers and then decide what the

799
00:30:59,350 --> 00:30:56,880
appropriate next steps are um whether or

800
00:31:01,509 --> 00:30:59,360
not any of those uh are at risk at this

801
00:31:03,029 --> 00:31:01,519
point is it's it i don't have the data

802
00:31:04,630 --> 00:31:03,039
in front front of me to answer that

803
00:31:06,710 --> 00:31:04,640
question

804
00:31:08,950 --> 00:31:06,720
thanks mike micah maydenberg with wall

805
00:31:11,190 --> 00:31:08,960
street journal

806
00:31:13,190 --> 00:31:11,200
put your hand hi mike i wanted to follow

807
00:31:15,350 --> 00:31:13,200
up on

808
00:31:16,789 --> 00:31:15,360
that you mentioned

809
00:31:17,990 --> 00:31:16,799
michael made work wall street journal

810
00:31:20,710 --> 00:31:18,000
just back to the introvert

811
00:31:22,149 --> 00:31:20,720
pressurization that was three times

812
00:31:23,029 --> 00:31:22,159
the amount of pressure that was planned

813
00:31:24,549 --> 00:31:23,039

for

814
00:31:26,870 --> 00:31:24,559
could you walk us through sort of what

815
00:31:29,430 --> 00:31:26,880
led up to that and have you seen that

816
00:31:30,870 --> 00:31:29,440
before in practice runs or at the

817
00:31:32,630 --> 00:31:30,880
testing facility

818
00:31:35,590 --> 00:31:32,640
thanks

819
00:31:38,070 --> 00:31:35,600
so um we're still we're still reviewing

820
00:31:38,789 --> 00:31:38,080
um the data and the sequence of events

821
00:31:41,750 --> 00:31:38,799
but

822
00:31:44,789 --> 00:31:41,760
as as i understand it it occurred during

823
00:31:47,269 --> 00:31:44,799
the uh the chill down prior to the

824
00:31:48,789 --> 00:31:47,279
to the loading operation associated with

825
00:31:49,909 --> 00:31:48,799
loading the liquid hydrogen liquid

826
00:31:52,230 --> 00:31:49,919
oxygen

827
00:31:53,350 --> 00:31:52,240
and it was part of the the preparatory

828
00:31:54,870 --> 00:31:53,360
steps

829
00:31:56,549 --> 00:31:54,880
and

830
00:31:58,870 --> 00:31:56,559
there was a

831
00:32:02,630 --> 00:31:58,880
sequence of about a dozen commands

832
00:32:05,350 --> 00:32:02,640
that were required and it was uh simply

833
00:32:10,230 --> 00:32:05,360
the wrong valve was commanded

834
00:32:14,630 --> 00:32:12,389
after about three or four seconds and

835
00:32:15,750 --> 00:32:14,640
then it was rectified so that's that's

836
00:32:17,590 --> 00:32:15,760
what we understand we know what the

837
00:32:19,909 --> 00:32:17,600
pressure profile looked like

838
00:32:23,669 --> 00:32:19,919

at this particular interface

839
00:32:25,830 --> 00:32:23,679
and um we're we're looking at uh again

840
00:32:29,110 --> 00:32:25,840
the the sequence and

841
00:32:31,269 --> 00:32:29,120
and as was mentioned by our our lead

842
00:32:33,190 --> 00:32:31,279
project engineer earlier today

843
00:32:35,990 --> 00:32:33,200
um you know we want we want to be

844
00:32:37,990 --> 00:32:36,000
deliberate and careful about about um

845
00:32:40,630 --> 00:32:38,000
drawing conclusions here because

846
00:32:44,470 --> 00:32:40,640
correlation does not equal causation so

847
00:32:46,789 --> 00:32:44,480
we we are we are taking a look at the

848
00:32:49,269 --> 00:32:46,799
inadvertent overpress

849
00:32:50,549 --> 00:32:49,279
and we're looking at what that meant to

850
00:32:52,070 --> 00:32:50,559
this particular

851
00:32:54,389 --> 00:32:52,080
uh interface

852
00:32:57,590 --> 00:32:54,399
and then we're looking at the fault tree

853
00:33:00,630 --> 00:32:57,600
associated with the

854
00:33:05,590 --> 00:33:00,640
the leak that we saw and if there is

855
00:33:08,870 --> 00:33:05,600
uh a a conjunction of of potential

856
00:33:10,710 --> 00:33:08,880
causes on the fault tree then then we'll

857
00:33:12,870 --> 00:33:10,720
that'll take us down one path

858
00:33:15,190 --> 00:33:12,880
um if

859
00:33:16,230 --> 00:33:15,200
there is no um

860
00:33:18,070 --> 00:33:16,240
you know

861
00:33:19,350 --> 00:33:18,080
root cause that you can trace to that

862
00:33:20,870 --> 00:33:19,360
then then that'll take us down a

863
00:33:23,990 --> 00:33:20,880

different path so again it's a little

864
00:33:26,230 --> 00:33:24,000
early to tell we've we've looked through

865
00:33:27,430 --> 00:33:26,240
um quite a bit of information already

866
00:33:28,310 --> 00:33:27,440
but we've got to work our way through

867
00:33:31,029 --> 00:33:28,320
this one and we're going to do it

868
00:33:31,039 --> 00:33:35,269
jeff faust with space news

869
00:33:39,029 --> 00:33:37,509
jeff house of space news um if the

870
00:33:40,789 --> 00:33:39,039
eastern range allows you to extend the

871
00:33:43,029 --> 00:33:40,799
life of the fts and you're able to do

872
00:33:44,470 --> 00:33:43,039
the repairs on the pad are there any

873
00:33:48,310 --> 00:33:44,480
other factors that would allow you to

874
00:33:52,710 --> 00:33:50,789
i i think what i said earlier is we have

875
00:33:54,710 --> 00:33:52,720
to look at our stay at the pad because

876
00:33:55,750 --> 00:33:54,720
there's um

877
00:33:58,549 --> 00:33:55,760
some

878
00:34:00,230 --> 00:33:58,559
for orion at the crew and service module

879
00:34:01,990 --> 00:34:00,240
there's some constraints that how much

880
00:34:04,230 --> 00:34:02,000
time they can spend at the pad versus

881
00:34:06,310 --> 00:34:04,240
the winds

882
00:34:08,790 --> 00:34:06,320
so we we have to look at that and if

883
00:34:11,430 --> 00:34:08,800
we're within that that would be uh

884
00:34:14,069 --> 00:34:11,440
something we look at as a as a plus side

885
00:34:15,030 --> 00:34:14,079
if we can stay within that analysis

886
00:34:17,109 --> 00:34:15,040
um

887
00:34:18,550 --> 00:34:17,119
but i think ultimately we're driven by

888
00:34:20,710 --> 00:34:18,560

the fts i don't know if you have

889
00:34:23,909 --> 00:34:20,720
anything to add to that mike

890
00:34:29,109 --> 00:34:25,990
we need to we need to look at what

891
00:34:31,270 --> 00:34:29,119
exactly what work exactly we need to do

892
00:34:33,909 --> 00:34:31,280
and and there may be

893
00:34:36,069 --> 00:34:33,919
um depending on on the the fall tree

894
00:34:37,030 --> 00:34:36,079
analysis and and any inspection work

895
00:34:39,190 --> 00:34:37,040
that we do

896
00:34:40,710 --> 00:34:39,200
it may mean that the vehicle assembly

897
00:34:43,829 --> 00:34:40,720
building is the right place to go do

898
00:34:45,109 --> 00:34:43,839
this work um we are mindful that we're

899
00:34:46,829 --> 00:34:45,119
out there in the elements when we're at

900
00:34:51,190 --> 00:34:46,839
the pad

901
00:34:54,310 --> 00:34:51,200
that has a a couple of

902
00:34:55,909 --> 00:34:54,320
of pros and cons associated with it um

903
00:34:57,750 --> 00:34:55,919
you know the cons

904
00:34:59,430 --> 00:34:57,760
happen pretty much every afternoon

905
00:35:00,870 --> 00:34:59,440
around here when you get a shower or

906
00:35:04,390 --> 00:35:00,880
thunderstorm rolling through and we

907
00:35:05,750 --> 00:35:04,400
don't wanna we don't want to

908
00:35:08,390 --> 00:35:05,760
you know have

909
00:35:10,310 --> 00:35:08,400
uh you know issues with that interface

910
00:35:12,710 --> 00:35:10,320
because we de-made it out there in the

911
00:35:15,349 --> 00:35:12,720
uh in the uh

912
00:35:16,550 --> 00:35:15,359
in the uh in the environment so

913
00:35:18,950 --> 00:35:16,560

we're going to talk through all those

914
00:35:21,349 --> 00:35:18,960
things i i think it's again a little bit

915
00:35:23,829 --> 00:35:21,359
early to say as to what the right path

916
00:35:25,270 --> 00:35:23,839
forward is a flight termination system

917
00:35:27,510 --> 00:35:25,280
is certainly one variable that we've got

918
00:35:29,589 --> 00:35:27,520
to consider as part of all this and as

919
00:35:31,190 --> 00:35:29,599
jim said earlier the range has

920
00:35:33,910 --> 00:35:31,200
in the space force have been fantastic

921
00:35:36,870 --> 00:35:33,920
partners working with us as part of our

922
00:35:38,710 --> 00:35:36,880
government interagency work um we don't

923
00:35:41,829 --> 00:35:38,720
own that decision the range owns that

924
00:35:43,190 --> 00:35:41,839
decision uh so we would have to to work

925
00:35:45,829 --> 00:35:43,200
with them and talk to them before any

926
00:35:50,150 --> 00:35:45,839
decisions are made

927
00:35:53,750 --> 00:35:51,990
thank you hi marina corn with the

928
00:35:55,589 --> 00:35:53,760
atlantic are you at all considering

929
00:35:57,910 --> 00:35:55,599
doing another wet dress rehearsal after

930
00:35:59,270 --> 00:35:57,920
you've implemented some repairs instead

931
00:36:00,310 --> 00:35:59,280
of going right into another launch

932
00:36:01,829 --> 00:36:00,320
attempt

933
00:36:03,910 --> 00:36:01,839
the administrator said earlier we're not

934
00:36:05,270 --> 00:36:03,920
going to launch until it's right so in

935
00:36:07,109 --> 00:36:05,280
order to get to that point is there

936
00:36:09,270 --> 00:36:07,119
anything that would make you say okay

937
00:36:11,430 --> 00:36:09,280
let's go back we're going to test until

938
00:36:13,990 --> 00:36:11,440

it's right thank you

939
00:36:16,069 --> 00:36:14,000
yeah i guess what i'd say is uh you know

940
00:36:18,630 --> 00:36:16,079
whatever this the connection that we

941
00:36:20,310 --> 00:36:18,640
we're testing under under ambient it's

942
00:36:23,109 --> 00:36:20,320
going to be acts a lot different than

943
00:36:24,950 --> 00:36:23,119
cryogens we've tested this one in our

944
00:36:27,589 --> 00:36:24,960
wet dress rehearsal for

945
00:36:30,550 --> 00:36:27,599
this sealed at four

946
00:36:33,270 --> 00:36:30,560
we saw it manageable the other day so to

947
00:36:35,430 --> 00:36:33,280
us you know it it's uh

948
00:36:36,870 --> 00:36:35,440
we hydrogen's difficult to work with i

949
00:36:39,430 --> 00:36:36,880
think mike characterized at a couple

950
00:36:42,230 --> 00:36:39,440
press conferences ago

951
00:36:44,230 --> 00:36:42,240
so from our perspective we may look at

952
00:36:46,150 --> 00:36:44,240
in these options when we stay at the pad

953
00:36:48,630 --> 00:36:46,160
if we change it at the pad do we do that

954
00:36:51,349 --> 00:36:48,640
cryogenic test there

955
00:36:53,510 --> 00:36:51,359
and what that cryogenic test consists of

956
00:36:54,550 --> 00:36:53,520
is is tbd that's what the team will come

957
00:36:56,550 --> 00:36:54,560
up with

958
00:36:58,870 --> 00:36:56,560
but from my perspective we tested this

959
00:37:00,550 --> 00:36:58,880
at a wet dress so to say hey we should

960
00:37:03,670 --> 00:37:00,560
have done another wet dress this one

961
00:37:05,430 --> 00:37:03,680
this one sealed at the wet dress um you

962
00:37:06,390 --> 00:37:05,440
know i will take everybody back i think

963
00:37:08,710 --> 00:37:06,400

it uh

964
00:37:10,069 --> 00:37:08,720
the summer of 1990 was the summer of

965
00:37:11,750 --> 00:37:10,079
hydrogen where

966
00:37:12,790 --> 00:37:11,760
shuttle had been launching for nine

967
00:37:14,390 --> 00:37:12,800
years

968
00:37:16,069 --> 00:37:14,400
and they spent a whole summer chasing

969
00:37:18,790 --> 00:37:16,079
hydrogen leaks

970
00:37:20,550 --> 00:37:18,800
so um i'm not saying that's an excuse

971
00:37:21,829 --> 00:37:20,560
that's just a fact

972
00:37:23,589 --> 00:37:21,839
and we've seen a couple different

973
00:37:25,349 --> 00:37:23,599
hydrogen leaks i think we're trying to

974
00:37:27,670 --> 00:37:25,359
dial this vehicle in

975
00:37:29,349 --> 00:37:27,680
um whatever this fault was we have to

976
00:37:31,030 --> 00:37:29,359
find out and we will run it to ground

977
00:37:33,349 --> 00:37:31,040
and build that confidence that i talked

978
00:37:35,270 --> 00:37:33,359
about earlier to come out there again if

979
00:37:37,109 --> 00:37:35,280
if the team says hey a wet dress is the

980
00:37:38,150 --> 00:37:37,119
way to go then we need to figure that

981
00:37:39,910 --> 00:37:38,160
out

982
00:37:42,390 --> 00:37:39,920
but right now from my perspective we've

983
00:37:44,550 --> 00:37:42,400
tested this it's worked a couple times

984
00:37:45,990 --> 00:37:44,560
and it didn't today we'll figure out the

985
00:37:47,829 --> 00:37:46,000
reason why

986
00:37:49,430 --> 00:37:47,839
the only thing i would add is

987
00:37:52,550 --> 00:37:49,440
we know we don't need to do a full wet

988
00:37:54,630 --> 00:37:52,560

dress rehearsal if we were to

989
00:37:57,109 --> 00:37:54,640
test out this interface we for example

990
00:37:58,950 --> 00:37:57,119
we don't need to load the interim crawl

991
00:38:01,030 --> 00:37:58,960
propulsion stage or the upper stage we

992
00:38:05,109 --> 00:38:01,040
know that those interfaces are fine

993
00:38:07,030 --> 00:38:05,119
so if if we were to do a a cryo test at

994
00:38:09,349 --> 00:38:07,040
this particular interface after some

995
00:38:10,950 --> 00:38:09,359
work is done at the pad

996
00:38:12,630 --> 00:38:10,960
we don't need to do

997
00:38:16,230 --> 00:38:12,640
a full up wet dress rehearsal if that

998
00:38:22,870 --> 00:38:17,510
next up we have another question on the

999
00:38:27,430 --> 00:38:25,109
um

1000
00:38:30,230 --> 00:38:27,440
serafin you talked about

1001
00:38:31,030 --> 00:38:30,240
it being inadvertent was that software

1002
00:38:33,750 --> 00:38:31,040
that

1003
00:38:35,670 --> 00:38:33,760
caused the over pressurization and

1004
00:38:38,310 --> 00:38:35,680
is that something you've not seen other

1005
00:38:40,310 --> 00:38:38,320
times when you're doing the pre-chill

1006
00:38:42,390 --> 00:38:40,320
and i take it from your earlier answer

1007
00:38:43,910 --> 00:38:42,400
soft goods uh that you're considering

1008
00:38:46,550 --> 00:38:43,920
that the over-pressurization may have

1009
00:38:50,150 --> 00:38:46,560
affected our gaskets o-rings anything

1010
00:38:55,589 --> 00:38:51,910
yeah so the the first part of that

1011
00:38:57,670 --> 00:38:55,599
question uh the inadvertent command

1012
00:38:59,510 --> 00:38:57,680
and overpress

1013
00:39:01,510 --> 00:38:59,520

again it's it's a little bit early to

1014
00:39:03,270 --> 00:39:01,520
tell exactly what happened we're still

1015
00:39:05,829 --> 00:39:03,280
working our way through but we do know

1016
00:39:06,710 --> 00:39:05,839
with this was a manual sequence

1017
00:39:10,150 --> 00:39:06,720
and

1018
00:39:14,710 --> 00:39:11,990
the fact that we didn't

1019
00:39:17,430 --> 00:39:14,720
automate this particular sequence

1020
00:39:18,870 --> 00:39:17,440
um that could have been part of the part

1021
00:39:21,270 --> 00:39:18,880
of the

1022
00:39:22,870 --> 00:39:21,280
reason that we had the uh the uh

1023
00:39:23,670 --> 00:39:22,880
inadvertent overpressure

1024
00:39:25,910 --> 00:39:23,680
there

1025
00:39:29,270 --> 00:39:25,920
are a whole host of other reasons that

1026
00:39:31,829 --> 00:39:29,280
um you know when when you're an operator

1027
00:39:33,910 --> 00:39:31,839
and and you're working through opera

1028
00:39:35,430 --> 00:39:33,920
a command sequence that could have also

1029
00:39:36,470 --> 00:39:35,440
come into play so we're just going to

1030
00:39:37,990 --> 00:39:36,480
take time and look through it we're

1031
00:39:40,230 --> 00:39:38,000
going to look through the data

1032
00:39:42,390 --> 00:39:40,240
and and we will we will

1033
00:39:44,710 --> 00:39:42,400
go back and reassess exactly

1034
00:39:46,550 --> 00:39:44,720
why this inadvertent command happened

1035
00:39:48,790 --> 00:39:46,560
in terms of soft goods yes it's

1036
00:39:50,349 --> 00:39:48,800
basically a a seal

1037
00:39:52,630 --> 00:39:50,359
that is that is a

1038
00:39:54,069 --> 00:39:52,640

non-non-metallic material i i don't

1039
00:39:57,349 --> 00:39:54,079
remember what the the particular

1040
00:40:00,230 --> 00:39:57,359
material is but yes that's what we mean

1041
00:40:01,589 --> 00:40:00,240
or what i mean when i say soft goods

1042
00:40:03,829 --> 00:40:01,599
thanks mike

1043
00:40:05,750 --> 00:40:03,839
irene klotz with aviation week

1044
00:40:06,550 --> 00:40:05,760
thanks um i think this is probably for

1045
00:40:09,349 --> 00:40:06,560
mike

1046
00:40:10,630 --> 00:40:09,359
um there was a some time between the

1047
00:40:12,790 --> 00:40:10,640
recommendation

1048
00:40:14,710 --> 00:40:12,800
to scrub and when charlie decided to

1049
00:40:16,550 --> 00:40:14,720
call it a day

1050
00:40:19,349 --> 00:40:16,560
was there additional troubleshooting

1051
00:40:22,230 --> 00:40:19,359
that was being discussed as an

1052
00:40:24,790 --> 00:40:22,240
as an option is there anything else that

1053
00:40:27,270 --> 00:40:24,800
was gleaned uh from the activities that

1054
00:40:29,589 --> 00:40:27,280
took place today and then separately is

1055
00:40:32,150 --> 00:40:29,599
the sensor issue that we were here

1056
00:40:33,670 --> 00:40:32,160
talking about a couple days ago is that

1057
00:40:36,550 --> 00:40:33,680
a factor at all in any of these

1058
00:40:38,790 --> 00:40:36,560
scenarios thanks

1059
00:40:40,550 --> 00:40:38,800
i'll start with your last question uh

1060
00:40:42,470 --> 00:40:40,560
the short answer is no the sensor issue

1061
00:40:44,710 --> 00:40:42,480
that we saw the other day it's that is

1062
00:40:46,309 --> 00:40:44,720
on the engine side as part of the engine

1063
00:40:49,430 --> 00:40:46,319

bleed that's used to thermally condition

1064
00:40:54,390 --> 00:40:52,630
to address it during this oh um

1065
00:40:57,270 --> 00:40:54,400
no that that really hasn't entered into

1066
00:40:59,430 --> 00:40:57,280
the into the discussion um in terms of

1067
00:41:02,230 --> 00:40:59,440
additional troubleshooting

1068
00:41:03,829 --> 00:41:02,240
there was a pause before a scrub was

1069
00:41:05,750 --> 00:41:03,839
declared just to ensure that we had

1070
00:41:08,870 --> 00:41:05,760
exhausted all of our options

1071
00:41:10,790 --> 00:41:08,880
and and we had um some discussions come

1072
00:41:13,030 --> 00:41:10,800
from our from our engineering team as to

1073
00:41:15,109 --> 00:41:13,040
what a potential um

1074
00:41:17,109 --> 00:41:15,119
option may be and it and it turned out

1075
00:41:19,589 --> 00:41:17,119
to not not be a viable option so there

1076
00:41:21,990 --> 00:41:19,599
were there were some ongoing discussions

1077
00:41:23,670 --> 00:41:22,000
to ensure that

1078
00:41:25,349 --> 00:41:23,680
we had really exhausted all of our

1079
00:41:26,950 --> 00:41:25,359
options and and that's why there was a

1080
00:41:30,870 --> 00:41:26,960
little bit of a pause towards the end

1081
00:41:36,150 --> 00:41:34,470
here in the second row

1082
00:41:38,790 --> 00:41:36,160
hi my name is jacob sedessie i'm a

1083
00:41:40,470 --> 00:41:38,800
student tech reporter at wuft news out

1084
00:41:43,430 --> 00:41:40,480
of the university of florida i have two

1085
00:41:44,950 --> 00:41:43,440
questions uh one so i know i heard

1086
00:41:47,430 --> 00:41:44,960
earlier that

1087
00:41:50,230 --> 00:41:47,440
the temperature affects how the rocket

1088
00:41:52,870 --> 00:41:50,240

launch goes in some ways so as summer

1089
00:41:56,069 --> 00:41:52,880
goes into fall goes into winter how is

1090
00:41:58,470 --> 00:41:56,079
this mission going to need to be adapted

1091
00:41:59,990 --> 00:41:58,480
going forward this far into the future

1092
00:42:01,430 --> 00:42:00,000
and second of all i know it's one you're

1093
00:42:03,190 --> 00:42:01,440
not going to want to hear right now but

1094
00:42:05,190 --> 00:42:03,200
i want to ask it anyway

1095
00:42:07,190 --> 00:42:05,200
how does this push back affect the

1096
00:42:08,550 --> 00:42:07,200
timeline of the artemis program as a

1097
00:42:10,710 --> 00:42:08,560
whole

1098
00:42:15,190 --> 00:42:10,720
i'll take the second one

1099
00:42:19,109 --> 00:42:15,200
we are still planning artemis 2 in 2024

1100
00:42:20,950 --> 00:42:19,119
and artemis iii in 25.

1101
00:42:23,990 --> 00:42:20,960
okay and then in terms of temperature

1102
00:42:26,150 --> 00:42:24,000
effects because we have a combination of

1103
00:42:28,309 --> 00:42:26,160
of solid propellant

1104
00:42:31,990 --> 00:42:28,319
in the boosters and liquid propellant in

1105
00:42:34,390 --> 00:42:32,000
the core stage the core stage really has

1106
00:42:36,390 --> 00:42:34,400
no significant impact

1107
00:42:38,870 --> 00:42:36,400
due to temperature other than

1108
00:42:40,470 --> 00:42:38,880
what we call the boil off which is

1109
00:42:42,390 --> 00:42:40,480
you

1110
00:42:44,790 --> 00:42:42,400
cause the the propellant to go from a

1111
00:42:48,069 --> 00:42:44,800
liquid to a gas and and you're not able

1112
00:42:49,030 --> 00:42:48,079
to feed the engines um as part of that

1113
00:42:50,950 --> 00:42:49,040

that is

1114
00:42:53,430 --> 00:42:50,960
there's essentially no effect associated

1115
00:42:55,750 --> 00:42:53,440
with that um because

1116
00:42:57,990 --> 00:42:55,760
it is this is the as we go from summer

1117
00:43:00,550 --> 00:42:58,000
into the fall months

1118
00:43:01,349 --> 00:43:00,560
because you load the cryo and then you

1119
00:43:04,710 --> 00:43:01,359
go

1120
00:43:06,150 --> 00:43:04,720
and and you ensure that the tank is full

1121
00:43:08,630 --> 00:43:06,160
before you go

1122
00:43:11,990 --> 00:43:08,640
in terms of the solid

1123
00:43:14,550 --> 00:43:12,000
propulsion system the lower the bulk

1124
00:43:16,069 --> 00:43:14,560
temperature of the propellant the lower

1125
00:43:18,470 --> 00:43:16,079
the performance you get and we know what

1126
00:43:20,470 --> 00:43:18,480
the performance characteristics of this

1127
00:43:21,829 --> 00:43:20,480
these particular boosters are and

1128
00:43:23,270 --> 00:43:21,839
they've been tested throughout the full

1129
00:43:24,150 --> 00:43:23,280
range

1130
00:43:30,069 --> 00:43:24,160
the

1131
00:43:31,190 --> 00:43:30,079
performance will be slightly lower in

1132
00:43:33,190 --> 00:43:31,200
the fall

1133
00:43:35,109 --> 00:43:33,200
but when we looked at our performance

1134
00:43:39,030 --> 00:43:35,119
numbers they were eye watering in terms

1135
00:43:40,870 --> 00:43:39,040
of margin to our insertion altitude

1136
00:43:42,710 --> 00:43:40,880
that we were planning so we're not

1137
00:43:46,470 --> 00:43:42,720
particularly concerned with with

1138
00:43:46,480 --> 00:43:52,069

in the back here behind joey

1139
00:43:56,390 --> 00:43:54,790
thank you manuel masanti from devate um

1140
00:43:58,309 --> 00:43:56,400
given these two cancellations some

1141
00:44:00,069 --> 00:43:58,319
further delays i would like to know how

1142
00:44:02,230 --> 00:44:00,079
this affect the other payload on board

1143
00:44:04,230 --> 00:44:02,240
like the 10 cubesats that we have is

1144
00:44:06,870 --> 00:44:04,240
there any reason that we need to change

1145
00:44:11,589 --> 00:44:06,880
battery changes or how these affect the

1146
00:44:17,510 --> 00:44:13,990
i i think we answered the the cubesat

1147
00:44:20,309 --> 00:44:17,520
question earlier um we know that we have

1148
00:44:23,030 --> 00:44:20,319
limited battery life on the cubesats and

1149
00:44:24,710 --> 00:44:23,040
and we understand what the decay rate is

1150
00:44:27,829 --> 00:44:24,720
uh the customers

1151
00:44:28,630 --> 00:44:27,839
of the cubesats uh have been made aware

1152
00:44:32,950 --> 00:44:28,640
of

1153
00:44:35,190 --> 00:44:32,960
access is

1154
00:44:37,030 --> 00:44:35,200
before the cubesats were reloaded we

1155
00:44:38,069 --> 00:44:37,040
also have payloads inside the orion

1156
00:44:39,990 --> 00:44:38,079
capsule

1157
00:44:43,349 --> 00:44:40,000
things like radiation monitors and a

1158
00:44:44,309 --> 00:44:43,359
number of other things and we know

1159
00:44:46,550 --> 00:44:44,319
what the

1160
00:44:47,349 --> 00:44:46,560
the installed or baseline configuration

1161
00:44:48,710 --> 00:44:47,359
was

1162
00:44:51,109 --> 00:44:48,720
obviously the longer you sit out there

1163
00:44:53,030 --> 00:44:51,119

on the pad the more radiation some of

1164
00:44:55,109 --> 00:44:53,040
these sensors will accrue

1165
00:44:57,270 --> 00:44:55,119
but we also have witness

1166
00:44:59,190 --> 00:44:57,280
sensors in there to help us understand

1167
00:45:00,870 --> 00:44:59,200
what what we accumulated during the

1168
00:45:02,550 --> 00:45:00,880
space flight portion as opposed to here

1169
00:45:04,790 --> 00:45:02,560
on the ground so

1170
00:45:06,790 --> 00:45:04,800
you know there are a whole host of of

1171
00:45:09,109 --> 00:45:06,800
things that we that we plan ahead and

1172
00:45:09,910 --> 00:45:09,119
track and at this point you know that

1173
00:45:14,790 --> 00:45:09,920
we're

1174
00:45:16,710 --> 00:45:14,800
vehicle ready uh and where we understand

1175
00:45:18,630 --> 00:45:16,720
what the potential impacts are to the

1176
00:45:21,589 --> 00:45:18,640
payloads and and the cubesats whether

1177
00:45:23,109 --> 00:45:21,599
they're uh in orion or or on the space

1178
00:45:26,230 --> 00:45:23,119
launch system rocket is part of the 10

1179
00:45:28,230 --> 00:45:26,240
cubesats so um

1180
00:45:30,470 --> 00:45:28,240
right yeah i i think i think we've

1181
00:45:34,390 --> 00:45:30,480
talked that so

1182
00:45:36,710 --> 00:45:34,400
here in the second row hi um wuft at the

1183
00:45:39,829 --> 00:45:36,720
university of florida uh my question is

1184
00:45:42,069 --> 00:45:39,839
uh for the senator um

1185
00:45:43,990 --> 00:45:42,079
we understand that you know

1186
00:45:46,710 --> 00:45:44,000
you're not going until you're ready and

1187
00:45:48,470 --> 00:45:46,720
it is and that it's right um

1188
00:45:51,109 --> 00:45:48,480

and we know that scrubs are a very

1189
00:45:54,069 --> 00:45:51,119
natural part of all of the space

1190
00:45:55,270 --> 00:45:54,079
missions uh that said i gotta believe

1191
00:45:56,870 --> 00:45:55,280
that there's some level of

1192
00:46:00,309 --> 00:45:56,880
disappointment can you describe the

1193
00:46:02,870 --> 00:46:00,319
demeanor inside the lcc and specifically

1194
00:46:05,190 --> 00:46:02,880
how's um charlie blackwell thompson and

1195
00:46:08,230 --> 00:46:05,200
and what did you say to her today

1196
00:46:11,349 --> 00:46:08,240
um you know after the decision to scrub

1197
00:46:12,550 --> 00:46:11,359
the demeanor in the lcc is very

1198
00:46:14,630 --> 00:46:12,560
professional

1199
00:46:15,910 --> 00:46:14,640
they do their job

1200
00:46:18,150 --> 00:46:15,920
naturally

1201
00:46:19,430 --> 00:46:18,160
all of us no

1202
00:46:23,109 --> 00:46:19,440
no more than

1203
00:46:26,230 --> 00:46:23,119
than all of us including the lcc

1204
00:46:28,630 --> 00:46:26,240
wanted it to go today

1205
00:46:30,069 --> 00:46:28,640
but we also

1206
00:46:32,630 --> 00:46:30,079
and these guys that are the

1207
00:46:38,470 --> 00:46:32,640
professionals know

1208
00:46:42,550 --> 00:46:40,470
anything um did you share any private

1209
00:46:43,589 --> 00:46:42,560
moments with charlie how she holding up

1210
00:46:46,230 --> 00:46:43,599
anybody

1211
00:46:48,950 --> 00:46:46,240
any comments to you know

1212
00:46:50,470 --> 00:46:48,960
keep her and her team motive i mean

1213
00:46:52,390 --> 00:46:50,480

everybody's motivated but any other

1214
00:46:57,030 --> 00:46:52,400
comments that you can share

1215
00:46:59,910 --> 00:46:57,040
i will say this before mike answers that

1216
00:47:02,550 --> 00:46:59,920
this team is very aware

1217
00:47:04,550 --> 00:47:02,560
of potential fatigue

1218
00:47:07,270 --> 00:47:04,560
and therefore

1219
00:47:08,950 --> 00:47:07,280
they gave sufficient time off for the

1220
00:47:12,230 --> 00:47:08,960
team

1221
00:47:15,270 --> 00:47:12,240
yesterday after the mmt uh which

1222
00:47:16,230 --> 00:47:15,280
occurred uh i think two days ago l minus

1223
00:47:19,190 --> 00:47:16,240
two

1224
00:47:22,470 --> 00:47:19,200
uh they gave everybody the day off

1225
00:47:24,870 --> 00:47:22,480
so they could regroup and and rest

1226
00:47:29,030 --> 00:47:24,880
uh and that's uh part of the lessons

1227
00:47:32,630 --> 00:47:29,040
that came out of the challenger report

1228
00:47:33,430 --> 00:47:32,640
fatigue was a factor there

1229
00:47:36,549 --> 00:47:33,440
right

1230
00:47:38,790 --> 00:47:36,559
yeah in terms of the firing room and and

1231
00:47:41,109 --> 00:47:38,800
charlie in particular uh you know one of

1232
00:47:42,549 --> 00:47:41,119
the things that's

1233
00:47:44,470 --> 00:47:42,559
one of the one of the things that i

1234
00:47:47,190 --> 00:47:44,480
particularly enjoy about the agency is

1235
00:47:49,510 --> 00:47:47,200
you surround yourself with amazingly

1236
00:47:51,030 --> 00:47:49,520
capable people and and some amazing

1237
00:47:52,470 --> 00:47:51,040
leadership and charlie's certainly one

1238
00:47:54,069 --> 00:47:52,480

of those amazing leaders that we have in

1239
00:47:55,670 --> 00:47:54,079
the agency

1240
00:47:57,670 --> 00:47:55,680
when i uh

1241
00:47:58,710 --> 00:47:57,680
was talking to her about the scrub

1242
00:48:00,870 --> 00:47:58,720
decision

1243
00:48:02,230 --> 00:48:00,880
she was focused head in the game

1244
00:48:03,109 --> 00:48:02,240
she was

1245
00:48:06,630 --> 00:48:03,119
you know

1246
00:48:08,309 --> 00:48:06,640
focused on the operation and the flight

1247
00:48:10,790 --> 00:48:08,319
hardware and

1248
00:48:12,710 --> 00:48:10,800
uh safing the vehicle and ensuring that

1249
00:48:13,829 --> 00:48:12,720
our team had what they need had what

1250
00:48:15,750 --> 00:48:13,839
they needed

1251
00:48:16,950 --> 00:48:15,760
uh to uh to get through the remaining

1252
00:48:19,270 --> 00:48:16,960
operation

1253
00:48:20,390 --> 00:48:19,280
and uh you know

1254
00:48:22,309 --> 00:48:20,400
there's

1255
00:48:24,390 --> 00:48:22,319
that's that's kind of natural when you

1256
00:48:26,309 --> 00:48:24,400
come from the operations realm

1257
00:48:27,910 --> 00:48:26,319
uh you know there's there's definitely

1258
00:48:29,829 --> 00:48:27,920
time to reflect

1259
00:48:32,309 --> 00:48:29,839
uh on that after you come out of the

1260
00:48:33,829 --> 00:48:32,319
firing room on the drive home or once

1261
00:48:35,829 --> 00:48:33,839
you're home but

1262
00:48:37,589 --> 00:48:35,839
that was neither the time near the place

1263
00:48:39,750 --> 00:48:37,599

and she didn't show any inkling that she

1264
00:48:40,950 --> 00:48:39,760
was focused on anything other

1265
00:48:43,109 --> 00:48:40,960
than

1266
00:48:44,790 --> 00:48:43,119
the right decisions for her team and for

1267
00:48:47,589 --> 00:48:44,800
the for the spacecraft and for the

1268
00:48:47,599 --> 00:48:52,870
marcia smith the space policy online

1269
00:48:56,549 --> 00:48:54,109
marcia smith

1270
00:48:58,309 --> 00:48:56,559
spacepolicyonline.com uh jim and mike i

1271
00:49:00,069 --> 00:48:58,319
know you've both discussed this already

1272
00:49:01,670 --> 00:49:00,079
a couple times but i'm still unclear

1273
00:49:03,349 --> 00:49:01,680
about the decision as to whether or not

1274
00:49:05,109 --> 00:49:03,359
you're going to roll back jim i heard

1275
00:49:07,990 --> 00:49:05,119
you say you must roll back because of

1276
00:49:09,510 --> 00:49:08,000
the fts batteries mike i heard you say

1277
00:49:11,750 --> 00:49:09,520
if you roll back then you might be able

1278
00:49:13,190 --> 00:49:11,760
to recharge the cubesats you talked

1279
00:49:15,270 --> 00:49:13,200
about how you might have several you

1280
00:49:16,870 --> 00:49:15,280
think you have several weeks of work so

1281
00:49:18,790 --> 00:49:16,880
if you were to go to the range and ask

1282
00:49:20,950 --> 00:49:18,800
them to give you another waiver for the

1283
00:49:22,230 --> 00:49:20,960
sts it's not just a couple days it's

1284
00:49:23,109 --> 00:49:22,240
several weeks

1285
00:49:27,510 --> 00:49:23,119
so

1286
00:49:29,670 --> 00:49:27,520
and concisely say

1287
00:49:31,750 --> 00:49:29,680
are you rolling back or not or when will

1288
00:49:33,910 --> 00:49:31,760

you make a decision and is the fts

1289
00:49:35,990 --> 00:49:33,920
battery the only thing that stands in

1290
00:49:38,390 --> 00:49:36,000
your way of rolling back or not

1291
00:49:41,589 --> 00:49:38,400
we don't have an fts

1292
00:49:43,829 --> 00:49:41,599
waiver right now beyond 25 days

1293
00:49:45,109 --> 00:49:43,839
so until we have that we have to roll

1294
00:49:46,470 --> 00:49:45,119
back

1295
00:49:49,030 --> 00:49:46,480
in order to

1296
00:49:51,589 --> 00:49:49,040
to satisfy the range requirement

1297
00:49:52,790 --> 00:49:51,599
we i said we'll work with the range to

1298
00:49:54,710 --> 00:49:52,800
to

1299
00:49:57,190 --> 00:49:54,720
try and get that

1300
00:49:59,109 --> 00:49:57,200
but we have to decide what it is

1301
00:50:01,750 --> 00:49:59,119
what the duration we want based on the

1302
00:50:04,309 --> 00:50:01,760
launch period availability we have

1303
00:50:06,309 --> 00:50:04,319
and what they're willing to give us

1304
00:50:07,910 --> 00:50:06,319
so that negotiation hasn't happened so

1305
00:50:08,710 --> 00:50:07,920
as far as i'm concerned we have to roll

1306
00:50:10,069 --> 00:50:08,720
back

1307
00:50:11,349 --> 00:50:10,079
because we have to satisfy that

1308
00:50:13,829 --> 00:50:11,359
requirement

1309
00:50:16,230 --> 00:50:13,839
um that's where i think mike's if

1310
00:50:18,549 --> 00:50:16,240
statement comes from because we we there

1311
00:50:19,750 --> 00:50:18,559
is a possibility but we don't have that

1312
00:50:21,990 --> 00:50:19,760
today

1313
00:50:23,910 --> 00:50:22,000

and i'll just be upfront with you i

1314
00:50:25,349 --> 00:50:23,920
don't always pick the best words right

1315
00:50:27,349 --> 00:50:25,359
and and

1316
00:50:28,390 --> 00:50:27,359
and i i could have

1317
00:50:29,750 --> 00:50:28,400
chosen

1318
00:50:34,470 --> 00:50:29,760
a better

1319
00:50:36,950 --> 00:50:34,480
case and and jim is absolutely right it

1320
00:50:38,549 --> 00:50:36,960
is it is not our decision it is the

1321
00:50:40,069 --> 00:50:38,559
range's decision

1322
00:50:42,309 --> 00:50:40,079
they're the ones responsible for

1323
00:50:43,430 --> 00:50:42,319
managing public safety so

1324
00:50:44,950 --> 00:50:43,440
um

1325
00:50:47,030 --> 00:50:44,960
when we roll back

1326
00:50:49,910 --> 00:50:47,040
unless we get a waiver

1327
00:50:53,190 --> 00:50:49,920
it's it's it is a rollback scenario so

1328
00:50:54,390 --> 00:50:53,200
um i i said if and i apologize for that

1329
00:50:55,670 --> 00:50:54,400
i probably could have chosen better

1330
00:50:56,950 --> 00:50:55,680
words

1331
00:50:59,190 --> 00:50:56,960
if that's the hardest thing i had to

1332
00:51:03,109 --> 00:50:59,200
deal with today then

1333
00:51:03,119 --> 00:51:06,870
here in the back

1334
00:51:11,829 --> 00:51:09,030
good afternoon liz hurley waff

1335
00:51:14,230 --> 00:51:11,839
huntsville my question can be for any or

1336
00:51:15,990 --> 00:51:14,240
all of you all can you talk to me about

1337
00:51:19,109 --> 00:51:16,000
actual costs

1338
00:51:21,349 --> 00:51:19,119

of two back-to-back scrubs

1339
00:51:23,430 --> 00:51:21,359
and do you feel there's a cost to public

1340
00:51:24,790 --> 00:51:23,440
perception there was so much build up to

1341
00:51:26,790 --> 00:51:24,800
this launch

1342
00:51:29,270 --> 00:51:26,800
so many people came to florida to spend

1343
00:51:31,030 --> 00:51:29,280
a week hoping they'd get to see a moon

1344
00:51:33,190 --> 00:51:31,040
rocket fly

1345
00:51:36,630 --> 00:51:33,200
is there something that you're looking

1346
00:51:39,270 --> 00:51:36,640
at now regarding the public

1347
00:51:49,990 --> 00:51:39,280
you all talk about the back-to-back cost

1348
00:51:54,549 --> 00:51:52,710
you know space is the place

1349
00:51:55,589 --> 00:51:54,559
everybody is

1350
00:51:58,549 --> 00:51:55,599
really

1351
00:52:01,349 --> 00:51:58,559
interested in this mission and going

1352
00:52:03,190 --> 00:52:01,359
back to mars and getting ready to go

1353
00:52:06,630 --> 00:52:03,200
uh going back to the moon and getting

1354
00:52:10,470 --> 00:52:08,309
one of the things

1355
00:52:14,390 --> 00:52:10,480
that we did

1356
00:52:16,950 --> 00:52:14,400
early on was we tried to stress that

1357
00:52:20,790 --> 00:52:16,960
this is a test

1358
00:52:22,710 --> 00:52:20,800
and a test has certain risk

1359
00:52:25,910 --> 00:52:22,720
and uh

1360
00:52:27,670 --> 00:52:25,920
we pounded that in every public comment

1361
00:52:31,589 --> 00:52:27,680
that we had

1362
00:52:35,829 --> 00:52:31,599
in order to get expectations

1363
00:52:40,630 --> 00:52:38,870

and yet human nature is what you know it

1364
00:52:43,589 --> 00:52:40,640
is

1365
00:52:46,150 --> 00:52:43,599
people are ready

1366
00:52:47,750 --> 00:52:46,160
you saw the crowds out here on monday

1367
00:52:51,829 --> 00:52:47,760
morning

1368
00:52:57,270 --> 00:52:54,069
however

1369
00:53:02,069 --> 00:52:57,280
the nature of humans is that

1370
00:53:03,430 --> 00:53:02,079
we want to see it and participate in it

1371
00:53:06,549 --> 00:53:03,440
and

1372
00:53:08,470 --> 00:53:06,559
despite all that

1373
00:53:10,870 --> 00:53:08,480
that's why these guys are such

1374
00:53:12,230 --> 00:53:10,880
consummate professionals

1375
00:53:13,430 --> 00:53:12,240
they do it

1376
00:53:15,990 --> 00:53:13,440
by the book

1377
00:53:18,630 --> 00:53:16,000
and when it's ready

1378
00:53:19,910 --> 00:53:18,640
and as far as costs i mean i i can't

1379
00:53:20,710 --> 00:53:19,920
give you a number i can tell you the

1380
00:53:22,790 --> 00:53:20,720
cost

1381
00:53:24,950 --> 00:53:22,800
there's commodities we use with oxygen

1382
00:53:26,790 --> 00:53:24,960
and hydrogen we do try and recover some

1383
00:53:28,870 --> 00:53:26,800
of those as we drain back into our

1384
00:53:31,270 --> 00:53:28,880
supply tanks but a lot of those cryogens

1385
00:53:34,309 --> 00:53:31,280
boil off so we have to have them topped

1386
00:53:36,230 --> 00:53:34,319
off i forget how many tankers we had

1387
00:53:38,630 --> 00:53:36,240
after monday's attempt uh

1388
00:53:41,270 --> 00:53:38,640

exactly i think uh we had like five or

1389
00:53:43,270 --> 00:53:41,280
six waves is remember uh charlie talking

1390
00:53:45,190 --> 00:53:43,280
about but the exact cost of that oxygen

1391
00:53:49,750 --> 00:53:45,200
hydrogen i i can't tell you off the top

1392
00:53:54,309 --> 00:53:51,910
yeah i can't i can't tell you that off

1393
00:53:57,670 --> 00:53:54,319
the top of my head you know it's i go to

1394
00:53:59,670 --> 00:53:57,680
commodities first um and uh and

1395
00:54:02,470 --> 00:53:59,680
obviously you know we we schedule up

1396
00:54:04,390 --> 00:54:02,480
resources to to provide the common

1397
00:54:05,349 --> 00:54:04,400
tracking for for us

1398
00:54:07,430 --> 00:54:05,359
um

1399
00:54:09,670 --> 00:54:07,440
and then the the labor of the folks here

1400
00:54:11,510 --> 00:54:09,680
but the fo that labor folks are working

1401
00:54:13,510 --> 00:54:11,520
on anyway but so it's probably some of

1402
00:54:15,670 --> 00:54:13,520
the assets that aren't ours that are

1403
00:54:17,510 --> 00:54:15,680
outside of nasa's control and the liquid

1404
00:54:18,950 --> 00:54:17,520
oxygen and hydrogen but i'm sorry i

1405
00:54:22,230 --> 00:54:18,960
can't tell you what a number off top of

1406
00:54:26,870 --> 00:54:22,240
my head the cost of two scrubs is a lot

1407
00:54:32,549 --> 00:54:29,210
michael greshko with not you answer

1408
00:54:33,430 --> 00:54:32,559
[Laughter]

1409
00:54:39,670 --> 00:54:33,440
hi

1410
00:54:41,910 --> 00:54:39,680
we are coming up on the 60th anniversary

1411
00:54:43,670 --> 00:54:41,920
of president kennedy's famous rice

1412
00:54:48,309 --> 00:54:43,680
university speech in which he declared

1413
00:54:52,069 --> 00:54:49,270

nearly

1414
00:54:55,030 --> 00:54:52,079
60 years later how do you reflect on the

1415
00:54:58,710 --> 00:54:55,040
upcoming anniversary and the challenges

1416
00:55:00,230 --> 00:54:58,720
that we face as we choose once again

1417
00:55:01,910 --> 00:55:00,240
to go to the moon

1418
00:55:04,390 --> 00:55:01,920
thanks

1419
00:55:08,710 --> 00:55:04,400
as a matter of fact on the 60th

1420
00:55:10,390 --> 00:55:08,720
anniversary i will be in rice stadium

1421
00:55:12,549 --> 00:55:10,400
there will be

1422
00:55:14,789 --> 00:55:12,559
4 000

1423
00:55:17,349 --> 00:55:14,799
public school students

1424
00:55:21,030 --> 00:55:17,359
that will be in the stadium

1425
00:55:22,870 --> 00:55:21,040
just as it was 60 years ago

1426
00:55:24,630 --> 00:55:22,880
with public school

1427
00:55:28,150 --> 00:55:24,640
students

1428
00:55:31,670 --> 00:55:28,160
and what president kennedy said was we

1429
00:55:33,510 --> 00:55:31,680
choose to go to the moon and do other

1430
00:55:35,589 --> 00:55:33,520
things

1431
00:55:38,549 --> 00:55:35,599
not because it's easy

1432
00:55:41,030 --> 00:55:38,559
but because it's hard

1433
00:55:44,630 --> 00:55:41,040
this is a whole new vehicle a whole new

1434
00:55:47,510 --> 00:55:44,640
technology a whole new purpose

1435
00:55:49,829 --> 00:55:47,520
of going back to the moon in preparation

1436
00:55:51,589 --> 00:55:49,839
to go to mars

1437
00:55:55,910 --> 00:55:51,599
and yes

1438
00:56:00,630 --> 00:55:57,510

on the funds we have ken chang from the

1439
00:56:04,710 --> 00:56:03,510
hi thank you um you've all talked about

1440
00:56:05,750 --> 00:56:04,720
that you're not going to launch until

1441
00:56:07,349 --> 00:56:05,760
you're ready

1442
00:56:09,349 --> 00:56:07,359
i'm just wondering have you felt any

1443
00:56:11,190 --> 00:56:09,359
pressure from anywhere

1444
00:56:22,309 --> 00:56:11,200
anywhere within nasa from the white

1445
00:56:25,589 --> 00:56:24,789
well i can tell you from my standpoint

1446
00:56:27,510 --> 00:56:25,599
no

1447
00:56:31,190 --> 00:56:27,520
and if i knew about it

1448
00:56:35,750 --> 00:56:31,200
i would try to stop it but

1449
00:56:39,910 --> 00:56:37,990
i i would agree with that ken we're

1450
00:56:41,030 --> 00:56:39,920
we're not feeling external pressure on

1451
00:56:43,190 --> 00:56:41,040
any of this

1452
00:56:45,750 --> 00:56:43,200
this is something that

1453
00:56:47,829 --> 00:56:45,760
is his administrator nelson said you

1454
00:56:50,230 --> 00:56:47,839
know we're really focused on getting off

1455
00:56:52,069 --> 00:56:50,240
and getting off safely because of the

1456
00:56:53,829 --> 00:56:52,079
consequences of failure

1457
00:56:56,549 --> 00:56:53,839
so we're not feeling any pressure

1458
00:56:59,349 --> 00:56:57,910
so we're running up on the end of our

1459
00:57:00,870 --> 00:56:59,359
hour so you have time for one more

1460
00:57:03,190 --> 00:57:00,880
question

1461
00:57:05,190 --> 00:57:03,200
uh ken kramer

1462
00:57:07,190 --> 00:57:05,200
hi thank you ken kramer for space up

1463
00:57:08,710 --> 00:57:07,200

close let me ask mike sarafin a question

1464
00:57:11,430 --> 00:57:08,720
a couple you talked a question few

1465
00:57:13,109 --> 00:57:11,440
questions back about the possibility to

1466
00:57:15,829 --> 00:57:13,119
do cryoloading

1467
00:57:18,390 --> 00:57:15,839
to test that seal i'm wondering how much

1468
00:57:21,030 --> 00:57:18,400
cryos would you have to load

1469
00:57:22,789 --> 00:57:21,040
to test the seal if it's seated and and

1470
00:57:25,109 --> 00:57:22,799
what would be then the turnaround for a

1471
00:57:26,789 --> 00:57:25,119
launch

1472
00:57:28,870 --> 00:57:26,799
uh in terms of how much crowd we would

1473
00:57:32,549 --> 00:57:28,880
have to load it what we would really

1474
00:57:34,870 --> 00:57:32,559
only need to do is get through the uh

1475
00:57:36,630 --> 00:57:34,880
chill down slow fill and into the fast

1476
00:57:37,670 --> 00:57:36,640
fill and and typically when you get in

1477
00:57:39,030 --> 00:57:37,680
the fast field there's going to be a

1478
00:57:40,549 --> 00:57:39,040
leak that's where you're going to see it

1479
00:57:41,829 --> 00:57:40,559
because you have the highest flow rate

1480
00:57:44,789 --> 00:57:41,839
and the highest pressure you don't need

1481
00:57:47,430 --> 00:57:44,799
to fill the whole tank to do that so

1482
00:57:48,870 --> 00:57:47,440
you know it's it would be somewhere you

1483
00:57:51,030 --> 00:57:48,880
know five

1484
00:57:52,789 --> 00:57:51,040
plus percent it's it's not a significant

1485
00:57:53,670 --> 00:57:52,799
amount of the of the liquid hydrogen

1486
00:57:55,030 --> 00:57:53,680
tank

1487
00:57:55,990 --> 00:57:55,040
and i'm sorry what was the second part

1488
00:57:58,230 --> 00:57:56,000

of the question i've been up since

1489
00:57:59,990 --> 00:57:58,240
midnight some of them what's that

1490
00:58:01,430 --> 00:58:00,000
how long would you could you turn around

1491
00:58:04,309 --> 00:58:01,440
for a launch then would it be like two

1492
00:58:09,109 --> 00:58:05,589
again it

1493
00:58:11,030 --> 00:58:09,119
it depends on

1494
00:58:12,950 --> 00:58:11,040
a whole host of things

1495
00:58:16,309 --> 00:58:12,960
but you know in terms of replenishing

1496
00:58:18,309 --> 00:58:16,319
the commodities and and setting up for a

1497
00:58:19,829 --> 00:58:18,319
subsequent attempt

1498
00:58:24,150 --> 00:58:19,839
we know that we can turn around either

1499
00:58:25,910 --> 00:58:24,160
42 i'm sorry 48 or 72 hours

1500
00:58:27,349 --> 00:58:25,920
simply based on commodity and

1501
00:58:30,549 --> 00:58:27,359
replenishment

1502
00:58:32,470 --> 00:58:30,559
if if there were additional engineering

1503
00:58:34,069 --> 00:58:32,480
investigations or additional work that

1504
00:58:37,750 --> 00:58:34,079
we needed to do

1505
00:58:40,069 --> 00:58:37,760
following a cryo test at that interface

1506
00:58:41,750 --> 00:58:40,079
it is something that would have to be

1507
00:58:43,510 --> 00:58:41,760
factored in the plan we're gonna we're

1508
00:58:45,190 --> 00:58:43,520
gonna understand this better next week

1509
00:58:46,950 --> 00:58:45,200
but um

1510
00:58:48,789 --> 00:58:46,960
in terms of the the first part of that

1511
00:58:50,470 --> 00:58:48,799
question it's it's not a significant

1512
00:58:54,390 --> 00:58:50,480
amount of the crowd compared to the the

1513
00:58:57,750 --> 00:58:56,309

thanks mike as we said earlier we'll

1514
00:58:59,829 --> 00:58:57,760
have an update for you

1515
00:59:02,309 --> 00:58:59,839
next week on the path forward

1516
00:59:04,390 --> 00:59:02,319
and as always turn in tune into nasa tv

1517
00:59:06,549 --> 00:59:04,400
and our social media channels to keep up

1518
00:59:35,109 --> 00:59:06,559
to date on the latest thank you all for

1519
00:59:40,230 --> 00:59:38,309
well in my left hand i have a feather

1520
00:59:42,390 --> 00:59:40,240
and my right hand a hammer

1521
00:59:44,069 --> 00:59:42,400
and i guess one of the reasons uh we got

1522
00:59:46,630 --> 00:59:44,079
here today was because of a gentleman

1523
00:59:48,870 --> 00:59:46,640
named galileo a long time ago who made a