1
00:00:04,309 --> 00:00:02,710
good afternoon thank you for joining us

2
00:00:06,909 --> 00:00:04,319
here at nasa's kennedy space center in

3
00:00:09,589 --> 00:00:06,919
florida for the space shuttle endeavor

4
00:00:12,070 --> 00:00:09,599
sts-134 pre-launch news conference

5
00:00:14,549 --> 00:00:12,080
joining me today is mike moses mission

6
00:00:16,630 --> 00:00:14,559
management team chair and manager of the

7
00:00:18,710 --> 00:00:16,640
space shuttle launch integration

8
00:00:21,109 --> 00:00:18,720
good afternoon mike leinbach shuttle

9
00:00:22,950 --> 00:00:21,119
launch director good afternoon and kathy

10
00:00:24,150 --> 00:00:22,960
winters shuttle weather officer good

11
00:00:25,429 --> 00:00:24,160
afternoon

12
00:00:27,990 --> 00:00:25,439
we'll hear from our panelists and then

13
00:00:30,070 --> 00:00:28,000

take questions mr moses thanks kendra

14
00:00:32,229 --> 00:00:30,080
let's see we had a really good meeting

15
00:00:33,430 --> 00:00:32,239
today uh unanimous consent from the

16
00:00:34,709 --> 00:00:33,440
mission management team to press on with

17
00:00:37,270 --> 00:00:34,719
the launch countdown everything's in

18
00:00:38,630 --> 00:00:37,280
really great shape uh really no issues

19
00:00:40,950 --> 00:00:38,640
at all working

20
00:00:43,110 --> 00:00:40,960
we took our time to walk through uh the

21
00:00:45,270 --> 00:00:43,120
issue that caused the launch scrub last

22
00:00:47,190 --> 00:00:45,280
time the ap1 heater problem to make sure

23
00:00:49,110 --> 00:00:47,200
we truly understood our resolution and

24
00:00:51,430 --> 00:00:49,120
our fix that everybody had a chance to

25
00:00:53,110 --> 00:00:51,440
see that uh and and some of our

26
00:00:54,229 --> 00:00:53,120
independent teams that that haven't been

27
00:00:55,830 --> 00:00:54,239
paying attention to the nitty gritty

28
00:00:57,350 --> 00:00:55,840
details as we've been going through them

29
00:00:59,349 --> 00:00:57,360
down here

30
00:01:01,670 --> 00:00:59,359
and everybody was was fine with that so

31
00:01:04,869 --> 00:01:01,680
to give you the reader's digest version

32
00:01:06,789 --> 00:01:04,879
uh on launch day uh we had a heater in

33
00:01:08,310 --> 00:01:06,799
the apu system not working the auxiliary

34
00:01:09,750 --> 00:01:08,320
power unit system

35
00:01:11,429 --> 00:01:09,760
one of two redundant heaters and the

36
00:01:13,030 --> 00:01:11,439
rules requires to have both operational

37
00:01:14,710 --> 00:01:13,040
before we can fly

38
00:01:15,990 --> 00:01:14,720

worries about freezing concerns once you

39
00:01:18,070 --> 00:01:16,000
get in orbit

40
00:01:19,350 --> 00:01:18,080
so we scrubbed and went in and started

41
00:01:20,950 --> 00:01:19,360
our troubleshooting and found that those

42
00:01:22,149 --> 00:01:20,960
heaters weren't getting power they

43
00:01:23,910 --> 00:01:22,159
weren't getting power because one of the

44
00:01:25,510 --> 00:01:23,920
power distribution boxes had a fuse

45
00:01:27,190 --> 00:01:25,520
inside it blown

46
00:01:30,230 --> 00:01:27,200
that that blown fuse was caused by an

47
00:01:31,350 --> 00:01:30,240
external short external to that box and

48
00:01:33,190 --> 00:01:31,360
and through some really good data

49
00:01:34,310 --> 00:01:33,200
investigation the teams found that that

50
00:01:36,710 --> 00:01:34,320
the cause of that short actually

51
00:01:39,190 --> 00:01:36,720
occurred back in june when we were in

52
00:01:41,350 --> 00:01:39,200
the opf the order processing facility

53
00:01:42,389 --> 00:01:41,360
doing some testing on that circuit

54
00:01:44,310 --> 00:01:42,399
we had

55
00:01:46,630 --> 00:01:44,320
either come in contact with

56
00:01:48,389 --> 00:01:46,640
a connector on the thermostat that was

57
00:01:50,310 --> 00:01:48,399
already had already had bare metal on it

58
00:01:51,990 --> 00:01:50,320
or the testing itself caused that

59
00:01:53,109 --> 00:01:52,000
inadvertent contact and created the bare

60
00:01:54,550 --> 00:01:53,119
metal short

61
00:01:57,510 --> 00:01:54,560
but basically we found bare metal

62
00:01:59,190 --> 00:01:57,520
exposed wiring uh over a very small area

63
00:02:01,030 --> 00:01:59,200

but enough that it was in a locale that

64
00:02:02,389 --> 00:02:01,040
could have caused the short we knew we

65
00:02:04,069 --> 00:02:02,399
were working on the circuit at the time

66
00:02:06,149 --> 00:02:04,079
that the shorts showed up in our in our

67
00:02:08,229 --> 00:02:06,159
data so really conclusive proof that

68
00:02:09,430 --> 00:02:08,239
that was the cause and that was the

69
00:02:10,710 --> 00:02:09,440
problem

70
00:02:12,550 --> 00:02:10,720
even if we were wrong the

71
00:02:14,150 --> 00:02:12,560
troubleshooting we did because we hadn't

72
00:02:16,470 --> 00:02:14,160
found that smoking gun until the end of

73
00:02:17,830 --> 00:02:16,480
the the the line

74
00:02:20,309 --> 00:02:17,840
we had already replaced a bunch of

75
00:02:21,589 --> 00:02:20,319
wiring replaced a bunch of parts

76
00:02:23,670 --> 00:02:21,599
some of that had to be done just because

77
00:02:25,589 --> 00:02:23,680
the the fuse in the in the left af load

78
00:02:27,350 --> 00:02:25,599
control assembly box had blown and we

79
00:02:28,949 --> 00:02:27,360
needed to pull that box out

80
00:02:30,309 --> 00:02:28,959
so we had to do that work anyway but we

81
00:02:31,750 --> 00:02:30,319
went ahead and did some extra work just

82
00:02:33,509 --> 00:02:31,760
to be uh

83
00:02:35,350 --> 00:02:33,519
ultra conservative and when we were

84
00:02:37,110 --> 00:02:35,360
doing it we didn't quite know cause now

85
00:02:38,630 --> 00:02:37,120
we know cause we can look back and say

86
00:02:40,630 --> 00:02:38,640
some of that work wasn't required but it

87
00:02:41,910 --> 00:02:40,640
does give us further protection in case

88
00:02:43,670 --> 00:02:41,920

we are wrong

89
00:02:45,030 --> 00:02:43,680
that that tiny little chance that there

90
00:02:46,790 --> 00:02:45,040
was some other smart problem happening

91
00:02:47,990 --> 00:02:46,800
at the same time

92
00:02:51,030 --> 00:02:48,000
and so

93
00:02:52,229 --> 00:02:51,040
did an amazing job

94
00:02:54,229 --> 00:02:52,239
you look at some of the stuff they're

95
00:02:56,550 --> 00:02:54,239
taking this thermostat that's got a

96
00:02:57,830 --> 00:02:56,560
nickel wire running to it a conductor

97
00:02:59,190 --> 00:02:57,840
wire or it's actually a copper wire with

98
00:03:00,390 --> 00:02:59,200
nickel coating on it

99
00:03:02,229 --> 00:03:00,400
they're able to go with a scanning

100
00:03:04,149 --> 00:03:02,239
electron microscope and zoom down and

101
00:03:06,630 --> 00:03:04,159
find that there's tooling marks where

102
00:03:08,630 --> 00:03:06,640
the metal was scraped you can see uh

103
00:03:10,229 --> 00:03:08,640
melted insulation from the heat of the

104
00:03:12,550 --> 00:03:10,239
of the event the only piece that's

105
00:03:14,630 --> 00:03:12,560
missing is the molten metal that you

106
00:03:17,589 --> 00:03:14,640
would see as an arc jumped from the bare

107
00:03:19,270 --> 00:03:17,599
wire to whatever ground plane it had

108
00:03:20,630 --> 00:03:19,280
but we were actually at the time heating

109
00:03:22,390 --> 00:03:20,640
this thermostat up with a heat gun that

110
00:03:23,910 --> 00:03:22,400
has a metal tip on it

111
00:03:25,350 --> 00:03:23,920
if we inadvertently managed to touch

112
00:03:26,949 --> 00:03:25,360
that metal tip to the wire it would have

113
00:03:28,550 --> 00:03:26,959

melted directly through the insulator

114
00:03:30,789 --> 00:03:28,560
come in direct contact with the wire and

115
00:03:33,110 --> 00:03:30,799
shorted without an arc jumping the gap

116
00:03:35,030 --> 00:03:33,120
so we postulate that's what happened and

117
00:03:37,750 --> 00:03:35,040
again you could be a lawyer to say that

118
00:03:39,750 --> 00:03:37,760
we haven't exactly proven that was

119
00:03:42,149 --> 00:03:39,760
exactly it but in our minds we are good

120
00:03:44,070 --> 00:03:42,159
to go and we have no problems uh no

121
00:03:45,990 --> 00:03:44,080
problems expected with this apu heater

122
00:03:47,430 --> 00:03:46,000
anymore in this count so the team's got

123
00:03:49,990 --> 00:03:47,440
that all done like i said it required

124
00:03:52,390 --> 00:03:50,000
some pretty extensive retest and rework

125
00:03:54,710 --> 00:03:52,400
we did all that work

126
00:03:56,070 --> 00:03:54,720
nothing else really happened to us while

127
00:03:57,589 --> 00:03:56,080
we were down we had to change out a few

128
00:03:59,270 --> 00:03:57,599
batteries here and there

129
00:04:00,789 --> 00:03:59,280
and and then do the standard freshening

130
00:04:02,309 --> 00:04:00,799
up of the stuff in the crew cabin and

131
00:04:04,470 --> 00:04:02,319
and reload payloads and experiments in

132
00:04:06,070 --> 00:04:04,480
the crew cabin um other than that

133
00:04:08,229 --> 00:04:06,080
everything was great we we didn't talk

134
00:04:09,670 --> 00:04:08,239
much today looking ahead to launch

135
00:04:11,270 --> 00:04:09,680
countdown the system looks good the

136
00:04:12,550 --> 00:04:11,280
weather looks pretty good uh and we

137
00:04:14,789 --> 00:04:12,560
should be in real good shape for launch

138
00:04:16,710 --> 00:04:14,799

on monday morning uh with that turn over

139
00:04:18,550 --> 00:04:16,720
mike okay thanks mike we'll see the

140
00:04:20,629 --> 00:04:18,560
countdown for endeavors final mission is

141
00:04:22,390 --> 00:04:20,639
going extremely well we got the uh the

142
00:04:24,469 --> 00:04:22,400
cryogenic fuels on board for the fuel

143
00:04:25,990 --> 00:04:24,479
cell system today don't have the final

144
00:04:28,390 --> 00:04:26,000
numbers yet but i expect we'll have a

145
00:04:30,070 --> 00:04:28,400
good good full seven days plus hold time

146
00:04:32,790 --> 00:04:30,080
on on fuel cell

147
00:04:35,030 --> 00:04:32,800
cryos so no issue there next major

148
00:04:36,070 --> 00:04:35,040
milestone is rss retract tomorrow

149
00:04:37,590 --> 00:04:36,080
afternoon at

150
00:04:39,030 --> 00:04:37,600
noon time and we'll take a good hard

151
00:04:41,270 --> 00:04:39,040
look at the weather before we do that we

152
00:04:43,110 --> 00:04:41,280
have lightning commit criteria for that

153
00:04:45,189 --> 00:04:43,120
and we'll take a look and make sure that

154
00:04:46,870 --> 00:04:45,199
we're well within those criteria before

155
00:04:49,110 --> 00:04:46,880
we rotate the rss

156
00:04:51,270 --> 00:04:49,120
tanking for uh for launch begins just

157
00:04:53,110 --> 00:04:51,280
before midnight tomorrow night

158
00:04:54,469 --> 00:04:53,120
standard three-hour tanking

159
00:04:56,310 --> 00:04:54,479
and it leads up to the opening the

160
00:04:58,710 --> 00:04:56,320
launch window

161
00:04:59,909 --> 00:04:58,720
monday morning at 8 56 eastern time

162
00:05:01,749 --> 00:04:59,919
we're not working any issues in the

163
00:05:04,310 --> 00:05:01,759

launch countdown the team's team is

164
00:05:05,909 --> 00:05:04,320
ready to go and hopefully have a good

165
00:05:09,270 --> 00:05:05,919
lift off monday morning for mark kelly

166
00:05:12,870 --> 00:05:11,350
and for weather we do have a lot of

167
00:05:14,310 --> 00:05:12,880
weather in the area right now in fact if

168
00:05:15,830 --> 00:05:14,320
you were in this room with us like we

169
00:05:17,909 --> 00:05:15,840
are you can hear the thunder rumbling

170
00:05:20,629 --> 00:05:17,919
overhead we've had some thunderstorms

171
00:05:22,310 --> 00:05:20,639
roll in from the west we also issued

172
00:05:24,550 --> 00:05:22,320
some wind warnings and lightning

173
00:05:25,990 --> 00:05:24,560
warnings as well as a hail warning and

174
00:05:27,830 --> 00:05:26,000
that was mainly due to the fact we saw

175
00:05:29,350 --> 00:05:27,840
these thunderstorms coming across as we

176
00:05:31,430 --> 00:05:29,360
expected and we had a sea breeze sitting

177
00:05:33,749 --> 00:05:31,440
over the coast here so we expected

178
00:05:35,270 --> 00:05:33,759
weather to converge overhead which it

179
00:05:36,629 --> 00:05:35,280
has there's also a couple more waves

180
00:05:38,150 --> 00:05:36,639
that are coming because of a trough

181
00:05:39,830 --> 00:05:38,160
that's moving in from the west so we

182
00:05:41,749 --> 00:05:39,840
expect some more weather throughout the

183
00:05:43,270 --> 00:05:41,759
afternoon and into the evening now the

184
00:05:44,950 --> 00:05:43,280
good news is by tomorrow the weather

185
00:05:48,150 --> 00:05:44,960
should all be pushing out gradually and

186
00:05:50,070 --> 00:05:48,160
so by rss retract time the weather is

187
00:05:51,029 --> 00:05:50,080
going to be improving so and as we go

188
00:05:52,950 --> 00:05:51,039

through the day tomorrow we'll be

189
00:05:55,430 --> 00:05:52,960
improving so for ourselves retract

190
00:05:57,830 --> 00:05:55,440
weather looking promising also as we get

191
00:06:00,309 --> 00:05:57,840
into tanking and then by launch time our

192
00:06:01,990 --> 00:06:00,319
main concern is going to be cross winds

193
00:06:03,350 --> 00:06:02,000
at the shuttle landing facility and

194
00:06:04,950 --> 00:06:03,360
there's a slight chance of a low cloud

195
00:06:07,189 --> 00:06:04,960
ceiling as well so right now we're

196
00:06:08,950 --> 00:06:07,199
forecasting a 30 chance of ksc weather

197
00:06:10,309 --> 00:06:08,960
prohibiting launch

198
00:06:12,390 --> 00:06:10,319
looking at the satellite picture you can

199
00:06:14,070 --> 00:06:12,400
see that we do have a lot of weather

200
00:06:15,830 --> 00:06:14,080
that's uh rolling through florida right

201
00:06:17,029 --> 00:06:15,840
now with the trough what's going on is

202
00:06:18,870 --> 00:06:17,039
there's an upper level low up to the

203
00:06:21,270 --> 00:06:18,880
north and with that there's some surface

204
00:06:23,110 --> 00:06:21,280
troughs that generally work like bicycle

205
00:06:25,909 --> 00:06:23,120
spokes going around the low coming

206
00:06:28,230 --> 00:06:25,919
through uh florida so we expect a wave a

207
00:06:29,749 --> 00:06:28,240
couple waves today and the big one

208
00:06:31,749 --> 00:06:29,759
really coming through this evening in

209
00:06:34,230 --> 00:06:31,759
the overnight hours pushing out by rss

210
00:06:36,469 --> 00:06:34,240
retract time now as we go into uh

211
00:06:37,990 --> 00:06:36,479
tanking weather will be improving and

212
00:06:40,150 --> 00:06:38,000
good and then by launch time again

213
00:06:41,510 --> 00:06:40,160

favorable uh so again thirty percent

214
00:06:43,749 --> 00:06:41,520
chance for kc weather programming launch

215
00:06:45,189 --> 00:06:43,759
now if we happen to delay 24 hours our

216
00:06:47,110 --> 00:06:45,199
main concern will just be another trough

217
00:06:48,950 --> 00:06:47,120
rolling through and so we actually are

218
00:06:51,110 --> 00:06:48,960
more concerned on tuesday about cross

219
00:06:53,350 --> 00:06:51,120
winds low cloud ceilings and showers

220
00:06:55,029 --> 00:06:53,360
within 20 nautical miles so with that

221
00:06:57,430 --> 00:06:55,039
we've increased the number on tuesday to

222
00:06:59,350 --> 00:06:57,440
a 60 percent chance of ksc weather

223
00:07:00,390 --> 00:06:59,360
prohibiting launch by wednesday it looks

224
00:07:02,390 --> 00:07:00,400
like a lot of the moisture is going to

225
00:07:04,150 --> 00:07:02,400
be pushed off to the east we do still

226
00:07:06,070 --> 00:07:04,160
have some crosswind concerns though so

227
00:07:07,670 --> 00:07:06,080
with just a 20 percent chance though on

228
00:07:09,510 --> 00:07:07,680
wednesday for ksc weather prohibiting

229
00:07:11,909 --> 00:07:09,520
launch as for the towel sites the

230
00:07:13,990 --> 00:07:11,919
weather looks good at two tile sites on

231
00:07:15,909 --> 00:07:14,000
launch day so overall it's looking

232
00:07:19,189 --> 00:07:15,919
promising for launch with again a 30

233
00:07:20,710 --> 00:07:19,199
chance of kc weather branding launch

234
00:07:22,309 --> 00:07:20,720
thank you we'll now hear from our

235
00:07:23,670 --> 00:07:22,319
panelists when the microphone comes your

236
00:07:24,870 --> 00:07:23,680
way please state your name your

237
00:07:26,230 --> 00:07:24,880
affiliation and to whom you're

238
00:07:27,749 --> 00:07:26,240

addressing your questions we'll start

239
00:07:29,670 --> 00:07:27,759
over here with marcia please marc

240
00:07:32,390 --> 00:07:29,680
shadown associated press do either of

241
00:07:35,270 --> 00:07:32,400
you gentlemen have any new crowd count

242
00:07:37,350 --> 00:07:35,280
coming any estimate and given the poor

243
00:07:39,270 --> 00:07:37,360
forecast on tuesday morning would you be

244
00:07:40,629 --> 00:07:39,280
inclined because of crowds and bad

245
00:07:42,230 --> 00:07:40,639
weather to just skip from monday to

246
00:07:43,510 --> 00:07:42,240
wednesday for a second attempt if you

247
00:07:45,589 --> 00:07:43,520
need it

248
00:07:47,990 --> 00:07:45,599
see we did check with our nasa security

249
00:07:49,990 --> 00:07:48,000
folks are in contact with all the local

250
00:07:51,909 --> 00:07:50,000
police departments and and the state

251
00:07:54,230 --> 00:07:51,919
highway patrol the estimate now is about

252
00:07:55,670 --> 00:07:54,240
500 000 people and you'll recall for the

253
00:07:57,589 --> 00:07:55,680
first launch attempt on that friday

254
00:07:59,510 --> 00:07:57,599
afternoon the estimate was between 500

255
00:08:00,950 --> 00:07:59,520
and 750 000

256
00:08:03,270 --> 00:08:00,960
so they're not quite expecting that big

257
00:08:05,510 --> 00:08:03,280
surge tomorrow but still uh be a heck of

258
00:08:07,350 --> 00:08:05,520
a traffic jam tomorrow after launch

259
00:08:09,350 --> 00:08:07,360
and uh you know as as mike and i have

260
00:08:10,550 --> 00:08:09,360
talked before about the 24 versus 48

261
00:08:11,990 --> 00:08:10,560
it's really going to be dependent on the

262
00:08:13,749 --> 00:08:12,000
day

263
00:08:15,270 --> 00:08:13,759

the traffic will play into a little bit

264
00:08:17,110 --> 00:08:15,280
the weather obviously plays into it the

265
00:08:19,510 --> 00:08:17,120
next day so a number of factors goes

266
00:08:20,710 --> 00:08:19,520
into the scrub turnaround decision so

267
00:08:23,110 --> 00:08:20,720
can't commit right now one way or the

268
00:08:27,350 --> 00:08:25,110
okay clara

269
00:08:29,270 --> 00:08:27,360
hi clara moskowitz with space.com and

270
00:08:30,869 --> 00:08:29,280
i'm just wondering if there's a point in

271
00:08:32,709 --> 00:08:30,879
the countdown that you'll know for sure

272
00:08:33,829 --> 00:08:32,719
that the heater issue is no longer a

273
00:08:36,149 --> 00:08:33,839
problem

274
00:08:38,230 --> 00:08:36,159
um let's see so after the tanks are the

275
00:08:39,909 --> 00:08:38,240
et's loaded we cycle those on with

276
00:08:42,149 --> 00:08:39,919
ground commands normally just the b

277
00:08:44,310 --> 00:08:42,159
heaters are used pre-launch and then

278
00:08:45,430 --> 00:08:44,320
they're deactivated right before liftoff

279
00:08:46,790 --> 00:08:45,440
and then the crew will turn them on

280
00:08:47,670 --> 00:08:46,800
manually once they get in orbit this

281
00:08:50,230 --> 00:08:47,680
time we're going to go ahead and check

282
00:08:52,150 --> 00:08:50,240
the a and the b just to double check

283
00:08:54,150 --> 00:08:52,160
as part of the troubleshooting

284
00:08:55,990 --> 00:08:54,160
we kind of have have run functionals on

285
00:08:57,350 --> 00:08:56,000
all those thermostats we know they work

286
00:08:59,190 --> 00:08:57,360
we know the temp the heaters work we

287
00:09:00,870 --> 00:08:59,200
know all the wiring works um the only

288
00:09:02,230 --> 00:09:00,880

thing we haven't done is is check it at

289
00:09:03,910 --> 00:09:02,240
the environment that it would see on

290
00:09:06,230 --> 00:09:03,920
launch day and so it's worth one more

291
00:09:07,750 --> 00:09:06,240
check there just to make sure too but uh

292
00:09:09,430 --> 00:09:07,760
we're not really doing it based on the

293
00:09:10,470 --> 00:09:09,440
cause we now know there's really no need

294
00:09:11,750 --> 00:09:10,480
for that check but we're going to go and

295
00:09:13,509 --> 00:09:11,760
do it anyway

296
00:09:15,590 --> 00:09:13,519
and that'll be that'll be after unstable

297
00:09:17,350 --> 00:09:15,600
replenish after all the crows are on

298
00:09:19,590 --> 00:09:17,360
board the tanks so somewhere between 2

299
00:09:21,350 --> 00:09:19,600
30 and 5 tomorrow or monday morning

300
00:09:22,949 --> 00:09:21,360
something like that

301
00:09:27,590 --> 00:09:22,959
todd

302
00:09:30,710 --> 00:09:27,600
and a follow if i could first for kathy

303
00:09:33,590 --> 00:09:30,720
could you remind me of the lightning

304
00:09:35,110 --> 00:09:33,600
criteria for rss rollback please

305
00:09:36,630 --> 00:09:35,120
sure there's a we can't have more than a

306
00:09:38,230 --> 00:09:36,640
twenty percent chance of lightning

307
00:09:41,190 --> 00:09:38,240
within five

308
00:09:43,030 --> 00:09:41,200
for our accessory tract okay and for uh

309
00:09:46,389 --> 00:09:43,040
for mike lineback um you're gonna be

310
00:09:48,230 --> 00:09:46,399
going into a uh firing room where you

311
00:09:49,430 --> 00:09:48,240
know a number of people this week uh

312
00:09:52,470 --> 00:09:49,440
received

313
00:09:54,949 --> 00:09:52,480

warn notices and i was just wondering

314
00:09:57,750 --> 00:09:54,959
what your thoughts are

315
00:10:01,190 --> 00:09:57,760
with going into a countdown with layoff

316
00:10:03,110 --> 00:10:01,200
notices uh going out to the workforce

317
00:10:04,870 --> 00:10:03,120
well you know todd we've known this has

318
00:10:07,110 --> 00:10:04,880
been coming for quite some time the

319
00:10:09,590 --> 00:10:07,120
timing is is probably not ideal as you

320
00:10:11,190 --> 00:10:09,600
as you point out the team is extremely

321
00:10:13,269 --> 00:10:11,200
professional uh

322
00:10:15,030 --> 00:10:13,279
and so the mood uh you know as we've

323
00:10:18,230 --> 00:10:15,040
talked about before the mood

324
00:10:19,990 --> 00:10:18,240
is a little bit down cast right now when

325
00:10:21,110 --> 00:10:20,000
you get off console and you're and

326
00:10:22,710 --> 00:10:21,120
you're talking to your friends in the

327
00:10:24,470 --> 00:10:22,720
hallway that's that's when you talk

328
00:10:26,630 --> 00:10:24,480
about things like this but when we're on

329
00:10:27,590 --> 00:10:26,640
console doing our job looking at our

330
00:10:28,389 --> 00:10:27,600
data

331
00:10:30,550 --> 00:10:28,399
we're

332
00:10:32,389 --> 00:10:30,560
i have no new work no worries at all

333
00:10:34,470 --> 00:10:32,399
about the team and being able to

334
00:10:35,829 --> 00:10:34,480
make the right calls on monday really

335
00:10:37,350 --> 00:10:35,839
throughout the whole remaining the

336
00:10:40,150 --> 00:10:37,360
countdown

337
00:10:41,910 --> 00:10:40,160
so timing's a little unfortunate yes

338
00:10:42,710 --> 00:10:41,920

but we've all known it's been coming and

339
00:10:44,310 --> 00:10:42,720
now

340
00:10:45,910 --> 00:10:44,320
people can can definitely plan their

341
00:10:48,389 --> 00:10:45,920
futures knowing knowing which way

342
00:10:49,430 --> 00:10:48,399
they're going to be going

343
00:10:53,750 --> 00:10:49,440
bill

344
00:10:55,910 --> 00:10:53,760
mike moses um just a chronology question

345
00:10:57,030 --> 00:10:55,920
on the presume short that was in june of

346
00:10:58,790 --> 00:10:57,040
last year

347
00:11:01,190 --> 00:10:58,800
when the spike occurred i guess that was

348
00:11:03,350 --> 00:11:01,200
in the data and that system that ran

349
00:11:05,509 --> 00:11:03,360
through alca2 that circuit card or

350
00:11:07,430 --> 00:11:05,519
hybrid driver i guess that never got

351
00:11:09,509 --> 00:11:07,440
powered until you're into fueling and

352
00:11:11,430 --> 00:11:09,519
launch counts i mean whatever happened

353
00:11:12,630 --> 00:11:11,440
back in june was simply undetected until

354
00:11:14,790 --> 00:11:12,640
you guys started trying to cycle

355
00:11:16,630 --> 00:11:14,800
thermostats when the aft got cold yeah

356
00:11:18,790 --> 00:11:16,640
you got it exactly right okay and the

357
00:11:20,949 --> 00:11:18,800
way it works is you know we have a bunch

358
00:11:22,310 --> 00:11:20,959
of heaters on the ship and and uh

359
00:11:23,829 --> 00:11:22,320
to go in and test them on the ground

360
00:11:25,829 --> 00:11:23,839
you'd have to basically go physically to

361
00:11:28,230 --> 00:11:25,839
each thermostat and cool it down with

362
00:11:30,710 --> 00:11:28,240
some some cool mist to make it colder in

363
00:11:32,230 --> 00:11:30,720

there than the ambient so in space that

364
00:11:32,949 --> 00:11:32,240
heater doesn't kick on

365
00:11:33,990 --> 00:11:32,959
uh

366
00:11:35,509 --> 00:11:34,000
at the temperatures that we are down

367
00:11:36,870 --> 00:11:35,519
here on the ground and so you'd have to

368
00:11:38,470 --> 00:11:36,880
go physically to every single heater in

369
00:11:40,230 --> 00:11:38,480
the af compartment and traffic wise that

370
00:11:41,670 --> 00:11:40,240
would take a lot of you're likely to

371
00:11:43,190 --> 00:11:41,680
cause a lot of collateral damage trying

372
00:11:45,430 --> 00:11:43,200
to go verify functionality of every

373
00:11:47,030 --> 00:11:45,440
single thermostat in the ship so we use

374
00:11:48,470 --> 00:11:47,040
our on-orbit time frame to check out the

375
00:11:52,069 --> 00:11:48,480
heaters

376
00:11:53,269 --> 00:11:52,079
and regulators other things that are

377
00:11:55,430 --> 00:11:53,279
hard to check if you're not really going

378
00:11:56,949 --> 00:11:55,440
to flow the system like in the ohms rcs

379
00:11:58,629 --> 00:11:56,959
system uh

380
00:11:59,829 --> 00:11:58,639
to to check that a regulator is working

381
00:12:01,110 --> 00:11:59,839
you have to go flow propellant through

382
00:12:03,509 --> 00:12:01,120
it you really don't want to do that in

383
00:12:05,269 --> 00:12:03,519
the opf if you don't have to so on orbit

384
00:12:06,389 --> 00:12:05,279
we we use we split the mission in half

385
00:12:08,710 --> 00:12:06,399
and for the first half of the mission we

386
00:12:09,990 --> 00:12:08,720
check out the the a side of the system

387
00:12:11,190 --> 00:12:10,000
and then we switch everything over on

388
00:12:13,030 --> 00:12:11,200

the second half of orbit we're checking

389
00:12:15,190 --> 00:12:13,040
out the b side so we verify

390
00:12:17,110 --> 00:12:15,200
functionality and operation in orbit but

391
00:12:18,870 --> 00:12:17,120
uh the over temp thermostats don't get

392
00:12:20,230 --> 00:12:18,880
checked out in orbit and so

393
00:12:21,750 --> 00:12:20,240
obviously unless the heater's failed and

394
00:12:23,750 --> 00:12:21,760
running away that overtemp's not going

395
00:12:25,190 --> 00:12:23,760
to work so on an interval in this case i

396
00:12:26,710 --> 00:12:25,200
think it was a four year interval that

397
00:12:28,870 --> 00:12:26,720
was due to come in and physically check

398
00:12:30,470 --> 00:12:28,880
functionality the overtemp and if you

399
00:12:32,150 --> 00:12:30,480
look at it from a process standpoint at

400
00:12:33,590 --> 00:12:32,160
the high level that's a little bit of an

401
00:12:35,509 --> 00:12:33,600
oversight right we verify that the

402
00:12:37,269 --> 00:12:35,519
heater works when it was in orbit and

403
00:12:39,509 --> 00:12:37,279
then we come back and verify that it now

404
00:12:41,269 --> 00:12:39,519
doesn't work like it's supposed to and

405
00:12:43,190 --> 00:12:41,279
we had the magic bullet happen is in the

406
00:12:44,790 --> 00:12:43,200
testing to make sure it didn't work we

407
00:12:46,790 --> 00:12:44,800
broke it and we didn't know that we

408
00:12:48,389 --> 00:12:46,800
broke it we thought it was not working

409
00:12:50,310 --> 00:12:48,399
because it was supposed to not work and

410
00:12:51,670 --> 00:12:50,320
then we didn't go back and re-verify

411
00:12:53,590 --> 00:12:51,680
functionality after we did the

412
00:12:55,110 --> 00:12:53,600
non-functional check so

413
00:12:56,550 --> 00:12:55,120

you kind of go through that and you say

414
00:12:57,990 --> 00:12:56,560
well that's in hindsight a pretty

415
00:12:59,670 --> 00:12:58,000
obvious thing but it's a it's a good

416
00:13:01,509 --> 00:12:59,680
example of the level of thought

417
00:13:03,350 --> 00:13:01,519
processes that

418
00:13:04,629 --> 00:13:03,360
both in 30 years of flying the shuttle

419
00:13:07,350 --> 00:13:04,639
you can have something like this kind of

420
00:13:08,629 --> 00:13:07,360
creep through and in in flying a shuttle

421
00:13:11,509 --> 00:13:08,639
that you recognize how thorough we

422
00:13:12,949 --> 00:13:11,519
really do need to be to verify you know

423
00:13:14,310 --> 00:13:12,959
something like a heater and when you

424
00:13:16,069 --> 00:13:14,320
check it and what you do in that system

425
00:13:17,990 --> 00:13:16,079
right after that is actually pretty

426
00:13:20,710 --> 00:13:18,000
important when we were talking about all

427
00:13:22,470 --> 00:13:20,720
these re-tests we do we do it because

428
00:13:24,150 --> 00:13:22,480
the ben pin analysis that we do shows

429
00:13:25,750 --> 00:13:24,160
that in any given connector you want to

430
00:13:27,670 --> 00:13:25,760
make sure that if one connector pin

431
00:13:29,190 --> 00:13:27,680
bends and touches another connector pin

432
00:13:30,710 --> 00:13:29,200
right next to it that those two

433
00:13:32,470 --> 00:13:30,720
functions that short together are in

434
00:13:35,030 --> 00:13:32,480
some critical system that would then

435
00:13:36,310 --> 00:13:35,040
cause loss of of crew or vehicles so i

436
00:13:38,550 --> 00:13:36,320
mean the amount of redundancy and

437
00:13:40,470 --> 00:13:38,560
analysis that's put into the retest when

438
00:13:41,829 --> 00:13:40,480

we break apart a system to verify that

439
00:13:43,829 --> 00:13:41,839
we put it back together properly is

440
00:13:45,590 --> 00:13:43,839
again a great example of how thorough we

441
00:13:47,189 --> 00:13:45,600
are this one's one of those that we

442
00:13:48,629 --> 00:13:47,199
probably weren't quite as thorough as we

443
00:13:49,670 --> 00:13:48,639
should have been but when you're

444
00:13:51,030 --> 00:13:49,680
thinking about it from a heater

445
00:13:51,990 --> 00:13:51,040
functionality standpoint you who would

446
00:13:53,350 --> 00:13:52,000
have thought that that would have been

447
00:13:55,670 --> 00:13:53,360
something you really needed to go double

448
00:13:57,430 --> 00:13:55,680
check so so we learned a lesson and

449
00:13:58,949 --> 00:13:57,440
hopefully in the next shuttle we'll

450
00:13:59,829 --> 00:13:58,959
we'll uh we'll design a little better

451
00:14:01,590 --> 00:13:59,839
test

452
00:14:03,350 --> 00:14:01,600
well i'll go off and try to get all that

453
00:14:04,870 --> 00:14:03,360
detail on our story so

454
00:14:07,030 --> 00:14:04,880
yeah i'm sure

455
00:14:08,629 --> 00:14:07,040
i'm kidding uh the uh the other question

456
00:14:10,230 --> 00:14:08,639
i had too is in the aft when you fuel

457
00:14:11,990 --> 00:14:10,240
and maybe mike lineback knows better

458
00:14:13,750 --> 00:14:12,000
what is ambient in the aft when you when

459
00:14:14,389 --> 00:14:13,760
you tank's full in your flooring i'm

460
00:14:15,269 --> 00:14:14,399
just trying to understand the

461
00:14:17,189 --> 00:14:15,279
temperature that would cause the

462
00:14:18,470 --> 00:14:17,199
thermostats to start cycling

463
00:14:20,230 --> 00:14:18,480

yeah i was going to say we i don't know

464
00:14:21,590 --> 00:14:20,240
what the actual temperatures but this we

465
00:14:24,069 --> 00:14:21,600
called this thing failed when it dropped

466
00:14:26,790 --> 00:14:24,079
below 40 degrees fahrenheit so

467
00:14:28,790 --> 00:14:26,800
it's not as cold in the aft as you might

468
00:14:30,550 --> 00:14:28,800
imagine it's probably in the 40s

469
00:14:33,350 --> 00:14:30,560
something like that

470
00:14:35,269 --> 00:14:33,360
okay irene

471
00:14:38,310 --> 00:14:35,279
um irene kloutz with reuters um i just

472
00:14:40,150 --> 00:14:38,320
had one follow-up mike moses for the um

473
00:14:42,710 --> 00:14:40,160
the scenario just laid out is this kind

474
00:14:44,790 --> 00:14:42,720
of a moot point though is there any um

475
00:14:47,189 --> 00:14:44,800
is the atlantis heaters

476
00:14:48,790 --> 00:14:47,199
not scheduled for this four-year check

477
00:14:50,629 --> 00:14:48,800
what is a good example of again on the

478
00:14:52,949 --> 00:14:50,639
thirdness so when we recognize that that

479
00:14:54,150 --> 00:14:52,959
this could have been a a problem that we

480
00:14:56,310 --> 00:14:54,160
caused by testing that we didn't

481
00:14:58,310 --> 00:14:56,320
recognize we caused uh we went back and

482
00:15:00,389 --> 00:14:58,320
looked everywhere else on this ship and

483
00:15:01,910 --> 00:15:00,399
on atlantis where we've done over temp

484
00:15:03,269 --> 00:15:01,920
thermostat checks

485
00:15:05,350 --> 00:15:03,279
to verify that we didn't have any

486
00:15:07,590 --> 00:15:05,360
unexpected current spikes in there that

487
00:15:08,629 --> 00:15:07,600
represented a loss of function so yeah

488
00:15:10,150 --> 00:15:08,639

we did go

489
00:15:12,470 --> 00:15:10,160
and check both the remainder of the

490
00:15:13,509 --> 00:15:12,480
heaters on this vehicle and on atlantis

491
00:15:15,030 --> 00:15:13,519
to make sure

492
00:15:15,990 --> 00:15:15,040
in a data standpoint reviewing the data

493
00:15:17,269 --> 00:15:16,000
to make sure we didn't cause any

494
00:15:19,269 --> 00:15:17,279
problems when we were doing any of those

495
00:15:21,110 --> 00:15:19,279
checkouts i don't recall specifically if

496
00:15:23,430 --> 00:15:21,120
we were doing any of this testing on

497
00:15:25,829 --> 00:15:23,440
atlantis given the interval nature of

498
00:15:27,750 --> 00:15:25,839
this test i doubt that atlantis had this

499
00:15:29,910 --> 00:15:27,760
specific test performed on it but but

500
00:15:31,189 --> 00:15:29,920
yeah so it was relevant in that we did

501
00:15:32,550 --> 00:15:31,199
our normal due diligence to check the

502
00:15:33,990 --> 00:15:32,560
rest of the fleet

503
00:15:34,870 --> 00:15:34,000
and not i have two other questions one

504
00:15:41,030 --> 00:15:34,880
is

505
00:15:42,310 --> 00:15:41,040
scheduled rollover since we spoke with

506
00:15:45,269 --> 00:15:42,320
you last um

507
00:15:46,870 --> 00:15:45,279
is there any uh further refinement on

508
00:15:47,829 --> 00:15:46,880
what the target launch date would be for

509
00:15:49,189 --> 00:15:47,839
that

510
00:15:51,430 --> 00:15:49,199
let's see mike the you guys are still

511
00:15:53,590 --> 00:15:51,440
playing in rollover on the seventh

512
00:15:55,829 --> 00:15:53,600
we'll roll over on 17th roll over from

513
00:15:57,110 --> 00:15:55,839

the opf to the vab on the 17th we'll

514
00:15:58,710 --> 00:15:57,120
we'll spend the night in the transfer

515
00:16:01,110 --> 00:15:58,720
aisle on the 17th and then go for mate

516
00:16:03,430 --> 00:16:01,120
to the external tank on the 18th and out

517
00:16:04,710 --> 00:16:03,440
to the pad the evening of the 31st of

518
00:16:06,949 --> 00:16:04,720
may

519
00:16:09,829 --> 00:16:06,959
200 first motion and hard down to pad

520
00:16:11,670 --> 00:16:09,839
about 4am on june the 1st

521
00:16:13,590 --> 00:16:11,680
and so what remains to still be decided

522
00:16:15,350 --> 00:16:13,600
is once we're out at the pad that's a

523
00:16:17,189 --> 00:16:15,360
pretty fixed schedule based on when 134

524
00:16:19,189 --> 00:16:17,199
launches how fast the pad can be turned

525
00:16:21,110 --> 00:16:19,199
around and ready to receive atlantis and

526
00:16:22,870 --> 00:16:21,120
the stack so so that's when june 1st

527
00:16:25,189 --> 00:16:22,880
comes in to say that's when the 31st

528
00:16:26,629 --> 00:16:25,199
june 1st you're ready to be at the pad

529
00:16:27,990 --> 00:16:26,639
then we have the work at the pad how

530
00:16:29,509 --> 00:16:28,000
many contingency days we protect and

531
00:16:30,790 --> 00:16:29,519
what order we want to do them in that's

532
00:16:32,470 --> 00:16:30,800
what we're still kind of working through

533
00:16:34,230 --> 00:16:32,480
right now which will ultimately set what

534
00:16:36,230 --> 00:16:34,240
the launch date needs to be so we've

535
00:16:37,829 --> 00:16:36,240
narrowed down to within a week week and

536
00:16:39,590 --> 00:16:37,839
a half window and now we just got to

537
00:16:40,710 --> 00:16:39,600
figure out exactly what that date needs

538
00:16:42,550 --> 00:16:40,720

to be

539
00:16:43,829 --> 00:16:42,560
what is what's the window now or still

540
00:16:45,509 --> 00:16:43,839
same thing i told you last time which is

541
00:16:47,749 --> 00:16:45,519
around the second week in june or july i

542
00:16:48,629 --> 00:16:47,759
keep saying june second week of july

543
00:16:50,069 --> 00:16:48,639
thanks

544
00:16:52,069 --> 00:16:50,079
and i just had another question to you

545
00:16:54,470 --> 00:16:52,079
about the lightning um if there is a

546
00:16:57,590 --> 00:16:54,480
lightning strike within a half mile i

547
00:16:59,509 --> 00:16:57,600
guess from the pad when the sensors are

548
00:17:01,030 --> 00:16:59,519
activated what does that mean like when

549
00:17:03,110 --> 00:17:01,040
you're in the countdown i mean would

550
00:17:06,309 --> 00:17:03,120
things stop and would there be a re-test

551
00:17:09,110 --> 00:17:06,319
of of various systems or um how would

552
00:17:11,990 --> 00:17:09,120
that kind of play out in a real-time

553
00:17:14,549 --> 00:17:12,000
real-time mode

554
00:17:16,789 --> 00:17:14,559
well see the the criteria for retest is

555
00:17:18,710 --> 00:17:16,799
is if we get within a half a mile and we

556
00:17:21,029 --> 00:17:18,720
see indications that we've had induced

557
00:17:23,189 --> 00:17:21,039
voltage either to the stack or to the

558
00:17:24,630 --> 00:17:23,199
or to the the fixed service structure

559
00:17:27,029 --> 00:17:24,640
that would cause us to question whether

560
00:17:28,630 --> 00:17:27,039
we had any any need for a re-test there

561
00:17:31,029 --> 00:17:28,640
there are various systems out there that

562
00:17:33,510 --> 00:17:31,039
we that were used to see if we've had

563
00:17:34,870 --> 00:17:33,520

any induced voltage to the ship that has

564
00:17:36,310 --> 00:17:34,880
happened before in launch countdown i

565
00:17:38,630 --> 00:17:36,320
think you'll recall a couple of years or

566
00:17:41,510 --> 00:17:38,640
so ago we had a strike uh during the l

567
00:17:42,789 --> 00:17:41,520
minus two i believe it was and and uh so

568
00:17:44,310 --> 00:17:42,799
we were sitting in the l minus two

569
00:17:45,510 --> 00:17:44,320
lightning just like today and the phone

570
00:17:47,270 --> 00:17:45,520
started ringing

571
00:17:49,029 --> 00:17:47,280
and uh so then we went into retest on

572
00:17:51,029 --> 00:17:49,039
that one because that one actually had

573
00:17:53,029 --> 00:17:51,039
some induced voltage to the ship so it

574
00:17:54,230 --> 00:17:53,039
depends on where the strike is how how

575
00:17:56,230 --> 00:17:54,240
uh how

576
00:17:58,150 --> 00:17:56,240
intense the strike is

577
00:18:00,310 --> 00:17:58,160
kathy you want to go through your

578
00:18:01,990 --> 00:18:00,320
the systems that we use to detect sure

579
00:18:02,950 --> 00:18:02,000
we we have a cloud-to-ground light we

580
00:18:04,549 --> 00:18:02,960
have two different cloud-to-ground

581
00:18:06,070 --> 00:18:04,559
lightning systems we gather data from

582
00:18:08,230 --> 00:18:06,080
one is our local system and then we have

583
00:18:10,150 --> 00:18:08,240
the national system as well and so we

584
00:18:12,070 --> 00:18:10,160
provide data that we can actually give

585
00:18:14,150 --> 00:18:12,080
an ellipse given the different sensors

586
00:18:16,390 --> 00:18:14,160
and how many sensors detect that

587
00:18:17,909 --> 00:18:16,400
particular stroke we can give a 99

588
00:18:21,430 --> 00:18:17,919

confidence ellipse that the stroke

589
00:18:23,990 --> 00:18:21,440
occurred within this particular area so

590
00:18:25,110 --> 00:18:24,000
we'll do that after every uh lightning

591
00:18:27,029 --> 00:18:25,120
anytime we get lightning within five

592
00:18:29,750 --> 00:18:27,039
nautical miles we gather the data and we

593
00:18:32,870 --> 00:18:29,760
send it in to the to the team and then

594
00:18:34,470 --> 00:18:32,880
they do the analysis if necessary

595
00:18:36,630 --> 00:18:34,480
this afternoon

596
00:18:38,070 --> 00:18:36,640
there wasn't any uh

597
00:18:39,669 --> 00:18:38,080
the the cloud to ground lightning

598
00:18:41,430 --> 00:18:39,679
detection system gives us two pieces of

599
00:18:42,470 --> 00:18:41,440
information one it will give us more

600
00:18:43,430 --> 00:18:42,480
than that but the main things we're

601
00:18:45,830 --> 00:18:43,440
looking for when it comes to the

602
00:18:47,590 --> 00:18:45,840
distance is the actual first guess

603
00:18:49,430 --> 00:18:47,600
so there was no

604
00:18:51,430 --> 00:18:49,440
first guess within a half mile within

605
00:18:53,750 --> 00:18:51,440
the pad perimeter and what what i do

606
00:18:55,029 --> 00:18:53,760
need to go back to do next is get the

607
00:18:57,190 --> 00:18:55,039
ellipse data and see if there was any

608
00:18:59,110 --> 00:18:57,200
ellipses within a half mile but right

609
00:19:00,630 --> 00:18:59,120
now there's not an indication yet but we

610
00:19:01,830 --> 00:19:00,640
like to be thorough and check all that

611
00:19:04,789 --> 00:19:01,840
all that data

612
00:19:08,150 --> 00:19:06,950
mark ratterman from talking space for

613
00:19:09,430 --> 00:19:08,160

mike moses

614
00:19:11,029 --> 00:19:09,440
another question on heaters and

615
00:19:12,630 --> 00:19:11,039
thermostats but not troubleshooting i

616
00:19:15,669 --> 00:19:12,640
understand the process that that you

617
00:19:16,630 --> 00:19:15,679
went through normal operation when uh in

618
00:19:18,870 --> 00:19:16,640
orbit

619
00:19:20,150 --> 00:19:18,880
do those multiple thermostats on each

620
00:19:22,390 --> 00:19:20,160
heater string

621
00:19:24,630 --> 00:19:22,400
do they cause the heater operation to

622
00:19:27,430 --> 00:19:24,640
ramp up under colder and

623
00:19:28,870 --> 00:19:27,440
colder temperatures in the aft bay

624
00:19:30,549 --> 00:19:28,880
yeah correct so it's a pretty simple

625
00:19:31,750 --> 00:19:30,559
circuit there's basically a wire

626
00:19:33,270 --> 00:19:31,760
resistance

627
00:19:34,470 --> 00:19:33,280
heater it's just a coil of wire that

628
00:19:36,470 --> 00:19:34,480
when you run electricity through it gets

629
00:19:38,870 --> 00:19:36,480
hot there's two of them and they're both

630
00:19:40,310 --> 00:19:38,880
wrapped around the the pipe uh so one is

631
00:19:43,510 --> 00:19:40,320
powered by the a circuit one's powered

632
00:19:45,669 --> 00:19:43,520
by the b and then they have a thermostat

633
00:19:46,710 --> 00:19:45,679
co-located in the general environment

634
00:19:49,430 --> 00:19:46,720
and the exact placement of the

635
00:19:51,270 --> 00:19:49,440
thermostat is is dictated both by the

636
00:19:52,950 --> 00:19:51,280
the thermodynamics of where you need to

637
00:19:54,789 --> 00:19:52,960
be to sense it and then some limitations

638
00:19:56,310 --> 00:19:54,799

just by the geometry in the ship but so

639
00:19:58,230 --> 00:19:56,320
there's a sensor that's then co-located

640
00:19:59,990 --> 00:19:58,240
somewhere in that heater zone and when

641
00:20:02,630 --> 00:20:00,000
the temperature gets cold just like in

642
00:20:04,549 --> 00:20:02,640
your house that thermostat would open up

643
00:20:06,149 --> 00:20:04,559
or close it depends on how your how you

644
00:20:08,390 --> 00:20:06,159
want to look at it which would then turn

645
00:20:10,310 --> 00:20:08,400
the heater on supply power heat warms up

646
00:20:12,070 --> 00:20:10,320
things get warm heater thermostat opens

647
00:20:13,909 --> 00:20:12,080
back up power gets removed and it's just

648
00:20:15,830 --> 00:20:13,919
this simple logic circuit as a as a

649
00:20:18,149 --> 00:20:15,840
little bi-metallic element rotates on

650
00:20:19,590 --> 00:20:18,159
and off and and turns power on and off

651
00:20:22,070 --> 00:20:19,600
the only thing that's unique about these

652
00:20:23,990 --> 00:20:22,080
that that you don't have in your normal

653
00:20:25,750 --> 00:20:24,000
coffee maker heater wiring is in that

654
00:20:28,070 --> 00:20:25,760
same circuit there's another thermostat

655
00:20:29,990 --> 00:20:28,080
which is meant to say if it gets too hot

656
00:20:32,070 --> 00:20:30,000
if that first thermostat fails and the

657
00:20:34,070 --> 00:20:32,080
heater comes on and stays on we don't

658
00:20:35,830 --> 00:20:34,080
want to over temp and melt anything so

659
00:20:37,750 --> 00:20:35,840
there's a thermostat directly in line

660
00:20:40,070 --> 00:20:37,760
with that heater and if it gets too hot

661
00:20:41,909 --> 00:20:40,080
it then turns itself off that's the one

662
00:20:43,350 --> 00:20:41,919
that had the problem the bare metal on

663
00:20:44,549 --> 00:20:43,360

it that we found was one of those over

664
00:20:48,470 --> 00:20:44,559
temp thermostats so we have control

665
00:20:51,350 --> 00:20:48,480
thermostats and over temp thermostats

666
00:20:54,950 --> 00:20:53,510
hi robert perlman with collectspace.com

667
00:20:57,110 --> 00:20:54,960
with just a quick follow-up for

668
00:20:58,789 --> 00:20:57,120
something mike limbach said

669
00:21:00,310 --> 00:20:58,799
just to verify

670
00:21:02,149 --> 00:21:00,320
given the date that you said for rollout

671
00:21:03,990 --> 00:21:02,159
for atlantis will that mean atlantis

672
00:21:06,549 --> 00:21:04,000
will be rolling out to the pad at the

673
00:21:09,590 --> 00:21:06,559
same time endeavour is landing given

674
00:21:12,149 --> 00:21:09,600
endeavors landing targeted for june 1st

675
00:21:14,149 --> 00:21:12,159
yeah it does say that and we've looked

676
00:21:15,750 --> 00:21:14,159
very hard at our workforce and and

677
00:21:16,950 --> 00:21:15,760
they're different people to take care of

678
00:21:18,950 --> 00:21:16,960
the landing and the rollout just

679
00:21:20,789 --> 00:21:18,960
completely different work crews and so

680
00:21:22,789 --> 00:21:20,799
if it does happen that way it'll be a

681
00:21:24,470 --> 00:21:22,799
very very special night

682
00:21:26,070 --> 00:21:24,480
landing

683
00:21:27,830 --> 00:21:26,080
we'll be rolling out to the pad we won't

684
00:21:29,909 --> 00:21:27,840
be hard down yet and then here comes

685
00:21:31,990 --> 00:21:29,919
endeavor back to ksc so it'll be a it'll

686
00:21:33,909 --> 00:21:32,000
be a nice night to witness and be part

687
00:21:34,710 --> 00:21:33,919
of

688
00:21:39,909 --> 00:21:34,720

okay

689
00:21:43,710 --> 00:21:41,750
hi ken kramer for space flight magazine

690
00:21:45,750 --> 00:21:43,720
i want to follow up on something from

691
00:21:46,710 --> 00:21:45,760
sts-135 you mentioned at the last

692
00:21:48,230 --> 00:21:46,720
briefing

693
00:21:50,549 --> 00:21:48,240
um you said you're going to do a tanking

694
00:21:53,510 --> 00:21:50,559
test i believe for

695
00:21:56,149 --> 00:21:53,520
that mission um and but why we did not

696
00:21:59,350 --> 00:21:56,159
need to do one for this mission

697
00:22:01,029 --> 00:21:59,360
sure ken so uh if we go back to the the

698
00:22:02,710 --> 00:22:01,039
previous slide sts-133 and that was

699
00:22:05,029 --> 00:22:02,720
et-137

700
00:22:06,710 --> 00:22:05,039
um that tank had the crack stringer that

701
00:22:08,390 --> 00:22:06,720
we found uh when we were loading for

702
00:22:09,830 --> 00:22:08,400
launch uh we went off in the

703
00:22:12,390 --> 00:22:09,840
investigation and found that we had a

704
00:22:14,310 --> 00:22:12,400
problem with the metal basically

705
00:22:16,310 --> 00:22:14,320
the fracture toughness was lower than it

706
00:22:18,470 --> 00:22:16,320
needed to be and then with the stack up

707
00:22:20,710 --> 00:22:18,480
of assembly stresses and other events

708
00:22:22,630 --> 00:22:20,720
caused that crack so we went off and

709
00:22:25,430 --> 00:22:22,640
looked and we knew that et-137 and

710
00:22:27,750 --> 00:22:25,440
et-138 both had similar

711
00:22:29,270 --> 00:22:27,760
metal that was of that same lot and

712
00:22:31,270 --> 00:22:29,280
therefore had the chance to have a

713
00:22:33,990 --> 00:22:31,280

problem so we went ahead and modified uh

714
00:22:36,070 --> 00:22:34,000
both those tanks so et-138 is flying on

715
00:22:38,549 --> 00:22:36,080
sts-135 so it's it's flying on the

716
00:22:40,870 --> 00:22:38,559
atlantis mission this tank on on

717
00:22:43,270 --> 00:22:40,880
endeavors mission et-122 was

718
00:22:45,190 --> 00:22:43,280
manufactured about 10 years before that

719
00:22:47,350 --> 00:22:45,200
um it was taken kind of out of sequence

720
00:22:49,590 --> 00:22:47,360
because uh it had gotten damaged from

721
00:22:52,470 --> 00:22:49,600
hurricane katrina uh had to get some

722
00:22:53,990 --> 00:22:52,480
mods made to it to become a a tank that

723
00:22:55,430 --> 00:22:54,000
was built before we did all these return

724
00:22:56,710 --> 00:22:55,440
to flight mods we call those inline

725
00:22:57,830 --> 00:22:56,720
tanks that have

726
00:22:59,190 --> 00:22:57,840
been flying the ones we've been finding

727
00:23:01,029 --> 00:22:59,200
recently have all these design changes

728
00:23:03,270 --> 00:23:01,039
put on from the beginning so this one

729
00:23:03,990 --> 00:23:03,280
kind of had to be retrofitted

730
00:23:05,430 --> 00:23:04,000
so

731
00:23:06,870 --> 00:23:05,440
we didn't have the same metal on this

732
00:23:08,789 --> 00:23:06,880
tank as we had on the other tanks so we

733
00:23:11,110 --> 00:23:08,799
don't need to test this one for cracks

734
00:23:12,390 --> 00:23:11,120
to make sure that the the metal is not

735
00:23:14,230 --> 00:23:12,400
anywhere we don't want it to be because

736
00:23:15,990 --> 00:23:14,240
we know that was not in that in that

737
00:23:18,470 --> 00:23:16,000
batch and we have pretty conclusive

738
00:23:19,830 --> 00:23:18,480

proof of that we were able to uh we went

739
00:23:21,270 --> 00:23:19,840
ahead and modified the tank anyway

740
00:23:23,190 --> 00:23:21,280
because we hadn't yet proved that to

741
00:23:24,710 --> 00:23:23,200
ourselves and when we did that mod we

742
00:23:26,390 --> 00:23:24,720
captured enough samples to go test and

743
00:23:28,070 --> 00:23:26,400
prove that yep that was actually good

744
00:23:29,830 --> 00:23:28,080
metal and we did not really need to do

745
00:23:31,750 --> 00:23:29,840
that mod it's kind of an overkill

746
00:23:33,270 --> 00:23:31,760
band-aid but it did let us take the

747
00:23:34,950 --> 00:23:33,280
tanking test off the plate for this

748
00:23:37,350 --> 00:23:34,960
mission so because you did the

749
00:23:39,029 --> 00:23:37,360
modification that's why uh well no we've

750
00:23:41,990 --> 00:23:39,039
done the modification to all tanks so

751
00:23:43,909 --> 00:23:42,000
all et-137 et-122 and et-138 all three

752
00:23:45,110 --> 00:23:43,919
will have the modification it was that

753
00:23:46,549 --> 00:23:45,120
this one's made of a different lot of

754
00:23:47,750 --> 00:23:46,559
metal which is why we didn't need to

755
00:23:49,269 --> 00:23:47,760
test it

756
00:23:51,029 --> 00:23:49,279
okay marshall you had a follow-up yeah

757
00:23:52,789 --> 00:23:51,039
marcia done associated press for kathy

758
00:23:55,190 --> 00:23:52,799
what is the long-range forecast be on

759
00:23:56,549 --> 00:23:55,200
wednesday just true the weather looks

760
00:23:58,630 --> 00:23:56,559
good through the end of the week and as

761
00:24:00,230 --> 00:23:58,640
we get into next weekend another

762
00:24:01,669 --> 00:24:00,240
front comes into the area and so we'd

763
00:24:03,110 --> 00:24:01,679

start having problems again with the

764
00:24:05,029 --> 00:24:03,120
weather next weekend

765
00:24:06,870 --> 00:24:05,039
that's only relevant for our golf games

766
00:24:09,590 --> 00:24:06,880
not for lunch

767
00:24:11,990 --> 00:24:09,600
we're launching monday

768
00:24:16,870 --> 00:24:13,990
yeah thanks todd halverson of florida

769
00:24:19,909 --> 00:24:16,880
today for either mike given this is

770
00:24:22,310 --> 00:24:19,919
endeavour's last flight i'm wondering if

771
00:24:28,149 --> 00:24:22,320
you guys have any favorite

772
00:24:33,029 --> 00:24:30,470
uh well see for me

773
00:24:34,789 --> 00:24:33,039
endeavour is special because

774
00:24:36,470 --> 00:24:34,799
the endeavor was the

775
00:24:39,350 --> 00:24:36,480
the vehicle we had for my first lead

776
00:24:40,630 --> 00:24:39,360
flight director job sts-123 um working

777
00:24:42,390 --> 00:24:40,640
with that crew in this mission it was

778
00:24:43,830 --> 00:24:42,400
the first time i got to to follow a

779
00:24:45,350 --> 00:24:43,840
little more thoroughly how the orbiter

780
00:24:46,950 --> 00:24:45,360
was processed through normally when

781
00:24:49,990 --> 00:24:46,960
you're working mission control back in

782
00:24:51,990 --> 00:24:50,000
houston uh you're coming in more on the

783
00:24:53,830 --> 00:24:52,000
the crew timeline and and the orbiter is

784
00:24:55,350 --> 00:24:53,840
the orbiter and uh and it's the vehicle

785
00:24:56,630 --> 00:24:55,360
you're flying on but how it got

786
00:24:58,070 --> 00:24:56,640
processed and where it is in its flow

787
00:24:59,269 --> 00:24:58,080
you don't really pay attention to so

788
00:25:00,630 --> 00:24:59,279

endeavor was the first one where i

789
00:25:02,549 --> 00:25:00,640
started getting the updates from the

790
00:25:04,710 --> 00:25:02,559
cape as to what was going on down in the

791
00:25:06,149 --> 00:25:04,720
opf when it was rolling out came down to

792
00:25:07,990 --> 00:25:06,159
watch roll out so it was the first one i

793
00:25:10,149 --> 00:25:08,000
got to kind of follow along from how an

794
00:25:12,549 --> 00:25:10,159
orbiter actually gets from landing back

795
00:25:13,750 --> 00:25:12,559
to launch again and uh and so that

796
00:25:14,950 --> 00:25:13,760
that'll always be special to me that

797
00:25:16,549 --> 00:25:14,960
endeavor was the first one i got to do

798
00:25:18,630 --> 00:25:16,559
that with

799
00:25:19,909 --> 00:25:18,640
well and for me you know

800
00:25:22,549 --> 00:25:19,919
i think i've talked about this before

801
00:25:24,390 --> 00:25:22,559
probably the first flow of endeavor uh

802
00:25:25,750 --> 00:25:24,400
will always be with me i was the nasa

803
00:25:28,310 --> 00:25:25,760
test director for that flow we did the

804
00:25:30,390 --> 00:25:28,320
flight and readiness firing firing

805
00:25:31,669 --> 00:25:30,400
and so the first one was was special

806
00:25:33,269 --> 00:25:31,679
because it was a brand new vehicle it

807
00:25:34,950 --> 00:25:33,279
was just as beautiful as it could

808
00:25:36,470 --> 00:25:34,960
possibly be

809
00:25:37,990 --> 00:25:36,480
i'll just say that the last time i went

810
00:25:39,110 --> 00:25:38,000
out to the patch he still looks awfully

811
00:25:40,789 --> 00:25:39,120
good out there

812
00:25:43,350 --> 00:25:40,799
got a lot of life left in her but that's

813
00:25:47,110 --> 00:25:43,360

not to be

814
00:25:50,710 --> 00:25:47,909
okay

815
00:25:53,029 --> 00:25:50,720
that will conclude today's sts-134

816
00:25:54,950 --> 00:25:53,039
pre-launch news conference please join

817
00:25:56,789 --> 00:25:54,960
us live on nasa television for our

818
00:25:58,870 --> 00:25:56,799
coverage of the

819
00:26:01,750 --> 00:25:58,880
launch which will begin at tanking

820
00:26:03,830 --> 00:26:01,760
coverage which starts at 11 30 tomorrow

821
00:26:06,549 --> 00:26:03,840
night that's eastern time it'll be

822
00:26:08,789 --> 00:26:06,559
followed by launch commentary for more

823
00:26:12,630 --> 00:26:08,799
information on the sts-134 mission and