1
00:00:06,230 --> 00:00:04,309
good morning thank you for joining us

2
00:00:08,230 --> 00:00:06,240
here at nasa's kennedy space center in

3
00:00:10,030 --> 00:00:08,240
florida for space shuttle discovery's

4
00:00:12,709 --> 00:00:10,040
sts-133

5
00:00:15,350 --> 00:00:12,719
pre-launch news conference joining me

6
00:00:17,029 --> 00:00:15,360
today is mike moses space shuttle launch

7
00:00:19,590 --> 00:00:17,039
integration manager and chair of the

8
00:00:21,910 --> 00:00:19,600
mission management team good morning

9
00:00:24,790 --> 00:00:21,920
mike leinbach shuttle launch director

10
00:00:30,550 --> 00:00:27,750
scott higginbotham sts-133 payload

11
00:00:32,150 --> 00:00:30,560
manager good morning

12
00:00:34,310 --> 00:00:32,160
and kathy winters shuttle weather

13
00:00:35,590 --> 00:00:34,320

officer good morning

14
00:00:37,510 --> 00:00:35,600
we'll hear from our panelists and then

15
00:00:39,110 --> 00:00:37,520
take questions mr moses

16
00:00:40,229 --> 00:00:39,120
thanks kendra well good morning

17
00:00:42,549 --> 00:00:40,239
everybody

18
00:00:44,630 --> 00:00:42,559
today we held our launch minus one day

19
00:00:46,470 --> 00:00:44,640
mission management team meeting where we

20
00:00:47,990 --> 00:00:46,480
got together just to discuss uh our

21
00:00:50,069 --> 00:00:48,000
current status and our readiness

22
00:00:52,069 --> 00:00:50,079
everything was is on track going

23
00:00:53,270 --> 00:00:52,079
beautifully with the countdown and we

24
00:00:54,150 --> 00:00:53,280
are more than ready for tomorrow's

25
00:00:55,910 --> 00:00:54,160
launch

26
00:00:57,350 --> 00:00:55,920
uh it was a pretty short meeting uh

27
00:00:59,110 --> 00:00:57,360
kathy talk to us a little bit about the

28
00:01:01,189 --> 00:00:59,120
weather you'll hear that today and

29
00:01:03,110 --> 00:01:01,199
actually scott had the uh had the

30
00:01:06,230 --> 00:01:03,120
biggest topic of the day to wrap up on

31
00:01:07,750 --> 00:01:06,240
an issue with iraq uh in the pmm just to

32
00:01:09,830 --> 00:01:07,760
make sure that it was uh configured

33
00:01:11,830 --> 00:01:09,840
properly some lessons we had learned

34
00:01:13,350 --> 00:01:11,840
from from one of the other mplms that

35
00:01:14,469 --> 00:01:13,360
came down made us question what we had

36
00:01:15,990 --> 00:01:14,479
configured

37
00:01:18,070 --> 00:01:16,000
in the bay and so they showed really

38
00:01:19,670 --> 00:01:18,080

good uh results today that said we were

39
00:01:21,830 --> 00:01:19,680
more than ready to fly with that

40
00:01:26,310 --> 00:01:21,840
configuration concern

41
00:01:28,550 --> 00:01:26,320
um we talked a little bit uh about uh a

42
00:01:30,149 --> 00:01:28,560
uh assist or an rcs which is the

43
00:01:32,149 --> 00:01:30,159
reaction control system the little

44
00:01:34,149 --> 00:01:32,159
steering thrusters on the shuttle

45
00:01:35,830 --> 00:01:34,159
one of the regulators in that system is

46
00:01:37,030 --> 00:01:35,840
is creeping which means it's it's

47
00:01:38,870 --> 00:01:37,040
letting a little bit of pressure through

48
00:01:40,149 --> 00:01:38,880
instead of holding it tight

49
00:01:42,389 --> 00:01:40,159
and it's it's creeping at a little

50
00:01:44,149 --> 00:01:42,399
higher rate than we allow it to uh but

51
00:01:46,389 --> 00:01:44,159
there's no real issue with that uh the

52
00:01:47,749 --> 00:01:46,399
other regs in line are holding just fine

53
00:01:49,830 --> 00:01:47,759
and there's an isolation valve that can

54
00:01:51,429 --> 00:01:49,840
be closed if it needs to be we're gonna

55
00:01:53,030 --> 00:01:51,439
have another meeting later today to go

56
00:01:54,950 --> 00:01:53,040
through the the details of that

57
00:01:56,149 --> 00:01:54,960
paperwork and sign the official

58
00:01:58,230 --> 00:01:56,159
waiver that says it doesn't meet the

59
00:01:59,590 --> 00:01:58,240
spec but it's okay to fly um and that

60
00:02:02,389 --> 00:01:59,600
was really the only shuttle technical

61
00:02:03,590 --> 00:02:02,399
issue we talked today uh at all um and

62
00:02:05,350 --> 00:02:03,600
again like i said about a 40 minute

63
00:02:07,270 --> 00:02:05,360

meeting went pretty fast

64
00:02:09,350 --> 00:02:07,280
um in other news

65
00:02:11,910 --> 00:02:09,360
we finished up yesterday a little bit

66
00:02:14,150 --> 00:02:11,920
this morning the uh the et modifications

67
00:02:16,390 --> 00:02:14,160
for the next tank et-122

68
00:02:17,990 --> 00:02:16,400
for sts-134 so the lockheed martin team

69
00:02:19,830 --> 00:02:18,000
that was here on site doing that

70
00:02:21,430 --> 00:02:19,840
mechanical modification and then

71
00:02:22,869 --> 00:02:21,440
re-spraying the foam

72
00:02:24,150 --> 00:02:22,879
on that tank has finished up and now

73
00:02:25,830 --> 00:02:24,160
there's just basically the shakedown

74
00:02:27,830 --> 00:02:25,840
inspections and we'll be ready for

75
00:02:29,270 --> 00:02:27,840
endeavor to come over and get mated at

76
00:02:31,190 --> 00:02:29,280
the end of the month

77
00:02:32,390 --> 00:02:31,200
and uh and that's it really so so we

78
00:02:33,670 --> 00:02:32,400
focused on the mission today and that's

79
00:02:35,190 --> 00:02:33,680
kind of what i wanted to focus on today

80
00:02:38,309 --> 00:02:35,200
at the press conference is

81
00:02:39,430 --> 00:02:38,319
uh we're ready to fly sts-133 we've been

82
00:02:41,350 --> 00:02:39,440
we've been ready from a mission

83
00:02:43,270 --> 00:02:41,360
standpoint for quite a while uh now our

84
00:02:45,030 --> 00:02:43,280
hardware is in line and ready to go

85
00:02:47,030 --> 00:02:45,040
uh you know we're delivering the pmm the

86
00:02:48,869 --> 00:02:47,040
permanent multi-purpose module which

87
00:02:50,949 --> 00:02:48,879
will be basically a really good addition

88
00:02:52,790 --> 00:02:50,959

to space station in terms of storage

89
00:02:55,030 --> 00:02:52,800
capability on orbit

90
00:02:56,869 --> 00:02:55,040
we're taking up the elc-4 external

91
00:02:59,110 --> 00:02:56,879
logistics cargo pallet

92
00:03:01,509 --> 00:02:59,120
which has a spare radiator and room for

93
00:03:03,270 --> 00:03:01,519
other spare hardware once it gets on on

94
00:03:05,430 --> 00:03:03,280
orbit and stowed on the station we have

95
00:03:06,550 --> 00:03:05,440
two very busy evas to clean up a lot of

96
00:03:08,390 --> 00:03:06,560
activities

97
00:03:11,430 --> 00:03:08,400
and prepare the station

98
00:03:12,710 --> 00:03:11,440
for the future and uh and finally uh

99
00:03:14,390 --> 00:03:12,720
he hasn't got a lot of press time lately

100
00:03:15,830 --> 00:03:14,400
but robonaut two still all nicely safe

101
00:03:18,390 --> 00:03:15,840
tucked away in the pmm and ready to get

102
00:03:19,910 --> 00:03:18,400
on orbit and start his mission we talked

103
00:03:21,270 --> 00:03:19,920
a lot in the past about all the science

104
00:03:23,350 --> 00:03:21,280
we're doing on this flight there's a lot

105
00:03:24,470 --> 00:03:23,360
of science going up in the pmm and

106
00:03:26,070 --> 00:03:24,480
there's a fair bit going up in the

107
00:03:27,110 --> 00:03:26,080
shuttle mid deck that the crews will

108
00:03:28,710 --> 00:03:27,120
execute

109
00:03:30,070 --> 00:03:28,720
while we're on orbit on space station

110
00:03:32,470 --> 00:03:30,080
and then we'll return on this mission

111
00:03:33,270 --> 00:03:32,480
and bring it back down um and and scott

112
00:03:34,710 --> 00:03:33,280
will probably tell you they're getting

113
00:03:35,990 --> 00:03:34,720

ready to stow a lot of that cargo here

114
00:03:37,589 --> 00:03:36,000
today the late stove stuff for those

115
00:03:39,190 --> 00:03:37,599
science activities so we're really

116
00:03:41,589 --> 00:03:39,200
looking forward to a very action-packed

117
00:03:43,030 --> 00:03:41,599
successful mission um and uh and

118
00:03:45,190 --> 00:03:43,040
everything's on track so with that i'll

119
00:03:46,630 --> 00:03:45,200
turn over mike okay thanks mike well

120
00:03:48,550 --> 00:03:46,640
everything's going extremely well on the

121
00:03:49,990 --> 00:03:48,560
launch countdown for discovery's last

122
00:03:52,149 --> 00:03:50,000
mission i'd like to commend the

123
00:03:53,589 --> 00:03:52,159
processing teams who worked on discovery

124
00:03:54,869 --> 00:03:53,599
and all the other flight elements and

125
00:03:56,390 --> 00:03:54,879
ground systems

126
00:03:58,470 --> 00:03:56,400
because what we're seeing is as we power

127
00:04:00,229 --> 00:03:58,480
them up and launch countdown no problems

128
00:04:02,070 --> 00:04:00,239
at all mike mentioned the rcs reg but

129
00:04:03,990 --> 00:04:02,080
that's really no big deal to us that's

130
00:04:05,990 --> 00:04:04,000
the only issue we're tracking

131
00:04:07,429 --> 00:04:06,000
we got a good load on our prsd system

132
00:04:09,750 --> 00:04:07,439
yesterday that's liquid oxygen and

133
00:04:11,190 --> 00:04:09,760
liquid hydrogen for the fuel cells we

134
00:04:13,429 --> 00:04:11,200
got right on the money we expected to

135
00:04:15,429 --> 00:04:13,439
get so good full eight nine days hold

136
00:04:17,270 --> 00:04:15,439
time on those two commodities

137
00:04:19,030 --> 00:04:17,280
the next major activity tonight at eight

138
00:04:20,550 --> 00:04:19,040

o'clock would be the retraction of the

139
00:04:21,990 --> 00:04:20,560
rotating service structure give

140
00:04:23,909 --> 00:04:22,000
everybody a good view of discovery on

141
00:04:25,350 --> 00:04:23,919
the pad for the last time

142
00:04:27,510 --> 00:04:25,360
tomorrow morning we'll get together at

143
00:04:28,469 --> 00:04:27,520
about seven o'clock and talk weather for

144
00:04:30,629 --> 00:04:28,479
tanking

145
00:04:32,469 --> 00:04:30,639
the forecast that kathy will show you in

146
00:04:34,070 --> 00:04:32,479
a couple of minutes looks pretty good

147
00:04:35,510 --> 00:04:34,080
and so we expect to be tanking in about

148
00:04:36,710 --> 00:04:35,520
7 25.

149
00:04:38,230 --> 00:04:36,720
the crew

150
00:04:39,430 --> 00:04:38,240
steve lindsey and the rest of his crew

151
00:04:41,270 --> 00:04:39,440
will be boarding the orbiter a little

152
00:04:43,990 --> 00:04:41,280
after 1 30 tomorrow afternoon shooting

153
00:04:45,990 --> 00:04:44,000
for the opening launch window at 16 45

154
00:04:48,310 --> 00:04:46,000
eastern time again we're not tracking

155
00:04:51,110 --> 00:04:48,320
any issues and discovery looks like

156
00:04:52,710 --> 00:04:51,120
she'll fly this time that's it scott

157
00:04:54,390 --> 00:04:52,720
all right thanks mike

158
00:04:56,550 --> 00:04:54,400
good morning everybody

159
00:04:58,070 --> 00:04:56,560
i'd like to brag a little bit about the

160
00:04:59,830 --> 00:04:58,080
amazing collection of hardware that

161
00:05:01,590 --> 00:04:59,840
we're getting ready to go fly aboard

162
00:05:03,110 --> 00:05:01,600
discovery i'll start in the back end

163
00:05:04,870 --> 00:05:03,120

work my way forward and talk a little

164
00:05:07,749 --> 00:05:04,880
bit about what's happened in the last

165
00:05:10,230 --> 00:05:07,759
four months since we spoke to you last

166
00:05:14,469 --> 00:05:10,240
first the permanent multipurpose module

167
00:05:15,430 --> 00:05:14,479
pmm the repurposed mplm fm1 leonardo

168
00:05:18,150 --> 00:05:15,440
we're

169
00:05:20,710 --> 00:05:18,160
about ready to add that module to the

170
00:05:22,469 --> 00:05:20,720
piazza di italia as my italian friends

171
00:05:24,469 --> 00:05:22,479
call it that's the collection growing

172
00:05:26,550 --> 00:05:24,479
collection of italian-built hardware

173
00:05:29,590 --> 00:05:26,560
on the international space station the

174
00:05:31,830 --> 00:05:29,600
modifications to turn the pmm or mplm

175
00:05:34,070 --> 00:05:31,840
into the pmm were predominantly

176
00:05:36,629 --> 00:05:34,080
performed by our partner talicillinius

177
00:05:38,870 --> 00:05:36,639
base led by roberto barreto that team

178
00:05:40,790 --> 00:05:38,880
did their work last year with our help

179
00:05:43,430 --> 00:05:40,800
and then we proceeded to get the module

180
00:05:46,070 --> 00:05:43,440
stuffed and loaded for flight

181
00:05:49,350 --> 00:05:46,080
the module's carrying up about 8 500

182
00:05:51,670 --> 00:05:49,360
pounds of cargo including the express

183
00:05:52,629 --> 00:05:51,680
rack 8 research facility

184
00:05:54,790 --> 00:05:52,639
and then

185
00:05:57,590 --> 00:05:54,800
i think mike mentioned our little friend

186
00:06:01,270 --> 00:05:57,600
robonaut too my daughter made this model

187
00:06:03,909 --> 00:06:01,280
of r2 for me he's my mascot

188
00:06:06,309 --> 00:06:03,919

as far as as far as we know we've not

189
00:06:08,230 --> 00:06:06,319
heard any any sound knocking sounds or

190
00:06:10,710 --> 00:06:08,240
any muffled cries of are we there yet

191
00:06:12,469 --> 00:06:10,720
coming from the module

192
00:06:14,950 --> 00:06:12,479
ends up robonaut's powered down and he

193
00:06:16,710 --> 00:06:14,960
can't speak he's ready to go clean his

194
00:06:18,309 --> 00:06:16,720
enclosure and ready to go to work in

195
00:06:20,790 --> 00:06:18,319
space

196
00:06:22,469 --> 00:06:20,800
we've not accessed the payload bay

197
00:06:24,469 --> 00:06:22,479
during the uh several months that we've

198
00:06:25,430 --> 00:06:24,479
been waiting to go fly we had no reason

199
00:06:27,430 --> 00:06:25,440
to

200
00:06:28,950 --> 00:06:27,440
so all the cargo complement remains as

201
00:06:30,150 --> 00:06:28,960
it was for the launch attempt back in

202
00:06:32,309 --> 00:06:30,160
the fall

203
00:06:33,749 --> 00:06:32,319
uh the hardware stayed on board and

204
00:06:35,510 --> 00:06:33,759
traveled with discovery when we went

205
00:06:37,189 --> 00:06:35,520
back to the vab and then ultimately back

206
00:06:39,029 --> 00:06:37,199
to the pad again

207
00:06:42,150 --> 00:06:39,039
forward of the pmm we have the express

208
00:06:44,629 --> 00:06:42,160
logistics carrier 4 or elc 4 which was

209
00:06:46,950 --> 00:06:44,639
lovingly put together by our friends up

210
00:06:49,589 --> 00:06:46,960
at goddard led by kevin carmack and our

211
00:06:52,309 --> 00:06:49,599
team here our boeing team here at ksc

212
00:06:54,150 --> 00:06:52,319
and on top of that express logistics

213
00:06:56,390 --> 00:06:54,160

carrier we have what we affectionately

214
00:06:58,790 --> 00:06:56,400
call the big hunk and radiator largest

215
00:07:00,309 --> 00:06:58,800
oru we've ever flown in the shuttle and

216
00:07:02,309 --> 00:07:00,319
hopefully we'll never have to use it but

217
00:07:04,550 --> 00:07:02,319
we'll have it up there if we do need it

218
00:07:06,550 --> 00:07:04,560
and also elc 4 will serve as a as a

219
00:07:08,469 --> 00:07:06,560
resting point for some other orus and

220
00:07:09,670 --> 00:07:08,479
payloads that we will bring up in the

221
00:07:11,589 --> 00:07:09,680
future

222
00:07:13,270 --> 00:07:11,599
so the payload elements are ready to go

223
00:07:15,270 --> 00:07:13,280
they've been ready to go since we closed

224
00:07:17,189 --> 00:07:15,280
them out for flight back in mid-october

225
00:07:19,189 --> 00:07:17,199
when we close the doors for flight and

226
00:07:20,710 --> 00:07:19,199
uh and they're quite content to set for

227
00:07:22,550 --> 00:07:20,720
quite a while longer too

228
00:07:24,150 --> 00:07:22,560
so at this point regardless of what the

229
00:07:25,589 --> 00:07:24,160
weather or the vehicle throws at us it

230
00:07:27,430 --> 00:07:25,599
would be our intent to keep the doors

231
00:07:28,629 --> 00:07:27,440
closed and just wait for that next

232
00:07:30,390 --> 00:07:28,639
launch attempt

233
00:07:32,390 --> 00:07:30,400
now moving forward into the mid deck we

234
00:07:34,070 --> 00:07:32,400
have about 1500 pounds of cargo that's

235
00:07:35,029 --> 00:07:34,080
headed to the iss in the mid deck of the

236
00:07:37,350 --> 00:07:35,039
orbiter

237
00:07:39,430 --> 00:07:37,360
that cargo complement has changed

238
00:07:41,670 --> 00:07:39,440

as we did have access to that hardware

239
00:07:43,430 --> 00:07:41,680
and you know spaces dynamics space ops

240
00:07:45,589 --> 00:07:43,440
are dynamic and the needs of the station

241
00:07:46,710 --> 00:07:45,599
have changed since we last attempted to

242
00:07:48,150 --> 00:07:46,720
go fly

243
00:07:49,909 --> 00:07:48,160
so we've taken advantage of the

244
00:07:52,150 --> 00:07:49,919
opportunity to shuffle some things

245
00:07:54,070 --> 00:07:52,160
around between this mission the atv that

246
00:07:56,230 --> 00:07:54,080
just launched htv that just launched in

247
00:07:58,070 --> 00:07:56,240
progress missions fortunately with lots

248
00:07:59,510 --> 00:07:58,080
of different vehicles carrying cargo to

249
00:08:00,629 --> 00:07:59,520
the station we can make those kinds of

250
00:08:02,309 --> 00:08:00,639
choices

251
00:08:04,550 --> 00:08:02,319
so we have a complement on board now

252
00:08:06,230 --> 00:08:04,560
that best represents our current needs

253
00:08:07,990 --> 00:08:06,240
and between all those flights we are

254
00:08:09,350 --> 00:08:08,000
keeping the station well stocked with

255
00:08:10,869 --> 00:08:09,360
everything the crew needs to live and

256
00:08:12,790 --> 00:08:10,879
work in space

257
00:08:15,589 --> 00:08:12,800
also in the in the mid deck as part of

258
00:08:17,110 --> 00:08:15,599
that 1500 pounds we have a variety of

259
00:08:19,029 --> 00:08:17,120
different experiments some of which are

260
00:08:20,629 --> 00:08:19,039
going to go across the boundary and be

261
00:08:21,909 --> 00:08:20,639
operated in the station but many of

262
00:08:24,710 --> 00:08:21,919
which are going to just stay on the

263
00:08:26,790 --> 00:08:24,720

orbiter and go up and come down

264
00:08:29,270 --> 00:08:26,800
the process for installing reinstalling

265
00:08:31,749 --> 00:08:29,280
those items into the orbiter began on

266
00:08:33,990 --> 00:08:31,759
monday and will finish tonight as mike

267
00:08:35,829 --> 00:08:34,000
indicated we'll start here at about noon

268
00:08:38,389 --> 00:08:35,839
today and should finish up around 8 pm

269
00:08:40,469 --> 00:08:38,399
tonight getting all those late load time

270
00:08:42,149 --> 00:08:40,479
critical experiments on board

271
00:08:44,310 --> 00:08:42,159
at that point the entire ulf-5

272
00:08:45,430 --> 00:08:44,320
complement will be on board and ready to

273
00:08:47,110 --> 00:08:45,440
go fly

274
00:08:49,750 --> 00:08:47,120
so in conclusion this has been an

275
00:08:52,310 --> 00:08:49,760
exercise in patience for us

276
00:08:54,389 --> 00:08:52,320
but we're anxious to finally see our

277
00:08:55,829 --> 00:08:54,399
hardware close to flying in space

278
00:08:57,829 --> 00:08:55,839
and being put to use on the

279
00:08:59,190 --> 00:08:57,839
international space station

280
00:09:01,670 --> 00:08:59,200
and with that

281
00:09:03,190 --> 00:09:01,680
kathy well great payload great weather

282
00:09:05,350 --> 00:09:03,200
right now we've had some great weather

283
00:09:07,190 --> 00:09:05,360
coming all the way up to launch we've

284
00:09:08,710 --> 00:09:07,200
had really nice mild conditions so we

285
00:09:11,350 --> 00:09:08,720
haven't had any cold temperatures to

286
00:09:12,949 --> 00:09:11,360
deal with even this time of year we just

287
00:09:14,310 --> 00:09:12,959
had some morning fog and that's really

288
00:09:16,230 --> 00:09:14,320

about it tomorrow morning though we're

289
00:09:17,430 --> 00:09:16,240
not expecting to see as much fog because

290
00:09:19,269 --> 00:09:17,440
the winds are going to shift around to

291
00:09:22,150 --> 00:09:19,279
the northeast and usually when we get an

292
00:09:23,829 --> 00:09:22,160
easterly flow over the coast here we

293
00:09:25,910 --> 00:09:23,839
tend to have maybe some inland fog but

294
00:09:27,910 --> 00:09:25,920
not fog here along the coast so weather

295
00:09:29,829 --> 00:09:27,920
conditions tomorrow are even better

296
00:09:31,190 --> 00:09:29,839
and as we get into the afternoon the

297
00:09:32,550 --> 00:09:31,200
only thing we'll be watching for is if

298
00:09:34,870 --> 00:09:32,560
we're going to have any isolated coastal

299
00:09:36,870 --> 00:09:34,880
showers that may linger offshore

300
00:09:38,790 --> 00:09:36,880
and and maybe be

301
00:09:40,070 --> 00:09:38,800
in the area in the morning expecting

302
00:09:41,350 --> 00:09:40,080
we're expecting them to die out in the

303
00:09:43,990 --> 00:09:41,360
afternoon

304
00:09:45,350 --> 00:09:44,000
and not be an issue so we just have a 20

305
00:09:47,430 --> 00:09:45,360
chance of having an isolated shower

306
00:09:49,670 --> 00:09:47,440
within 20 nautical miles of the shuttle

307
00:09:51,190 --> 00:09:49,680
landing facility or a low cloud ceiling

308
00:09:53,350 --> 00:09:51,200
but overall it looks like really good

309
00:09:55,030 --> 00:09:53,360
weather for launch also for the towel

310
00:09:57,030 --> 00:09:55,040
sites the space flight meteorology group

311
00:09:59,269 --> 00:09:57,040
is forecasting good weather there as

312
00:10:01,030 --> 00:09:59,279
well both the zaragoza amarone there's a

313
00:10:02,710 --> 00:10:01,040

little bit of a concern at istres for

314
00:10:05,350 --> 00:10:02,720
some windy conditions with winds gusting

315
00:10:06,870 --> 00:10:05,360
up to 28 knots so that may be a little

316
00:10:08,310 --> 00:10:06,880
bit problematic but we do have two good

317
00:10:10,790 --> 00:10:08,320
towel sites so

318
00:10:12,470 --> 00:10:10,800
that certainly meets our needs if we do

319
00:10:14,230 --> 00:10:12,480
happen to delay 24 hours there is a

320
00:10:16,069 --> 00:10:14,240
frontal system a cold front that should

321
00:10:17,269 --> 00:10:16,079
push into the florida area it's not

322
00:10:19,590 --> 00:10:17,279
going to bring us a lot of weather but

323
00:10:21,590 --> 00:10:19,600
it could bring us some clouds and maybe

324
00:10:23,350 --> 00:10:21,600
some isolated showers still a little bit

325
00:10:25,190 --> 00:10:23,360
to the north on friday so if we happen

326
00:10:26,710 --> 00:10:25,200
to delay it friday and we have a 30

327
00:10:28,949 --> 00:10:26,720
percent chance ksc weather bringing

328
00:10:30,870 --> 00:10:28,959
launch and if we happen to delay to

329
00:10:32,310 --> 00:10:30,880
saturday a lingering that lingering

330
00:10:33,910 --> 00:10:32,320
boundary will still be in the area and

331
00:10:36,150 --> 00:10:33,920
we're concerned about low cloud ceiling

332
00:10:38,630 --> 00:10:36,160
or an isolated shower so we increase our

333
00:10:40,790 --> 00:10:38,640
number again to a 40 chance but for

334
00:10:43,910 --> 00:10:40,800
launch day we only have a 20 chance of

335
00:10:45,750 --> 00:10:43,920
ksc weather prohibiting launch

336
00:10:47,430 --> 00:10:45,760
that's all i have thank you we'll now

337
00:10:48,710 --> 00:10:47,440
take questions when the microphone comes

338
00:10:50,069 --> 00:10:48,720

your way please state your name

339
00:10:52,150 --> 00:10:50,079
affiliation and to whom you're

340
00:10:55,829 --> 00:10:52,160
addressing your question

341
00:10:58,949 --> 00:10:57,670
um marcia dennis associated press for

342
00:11:00,710 --> 00:10:58,959
mike leimbach

343
00:11:01,670 --> 00:11:00,720
discovery always seems to have been the

344
00:11:03,030 --> 00:11:01,680
um

345
00:11:05,990 --> 00:11:03,040
favorite child if you will of the

346
00:11:07,190 --> 00:11:06,000
shuttle fleet the favorite child the the

347
00:11:10,949 --> 00:11:07,200
sweetheart however you want to

348
00:11:13,750 --> 00:11:10,959
characterize her fleet leader at least

349
00:11:16,630 --> 00:11:13,760
why is discovery special for you um

350
00:11:18,230 --> 00:11:16,640
if it is i'm sure it must be and any

351
00:11:19,910 --> 00:11:18,240
sentiments or

352
00:11:22,230 --> 00:11:19,920
extra feelings for you and your team

353
00:11:23,750 --> 00:11:22,240
going into the last flight of discovery

354
00:11:25,269 --> 00:11:23,760
the last flight of all all three

355
00:11:26,829 --> 00:11:25,279
vehicles is going to be

356
00:11:28,870 --> 00:11:26,839
emotional for all of

357
00:11:31,030 --> 00:11:28,880
us but we're going to complete these

358
00:11:32,550 --> 00:11:31,040
missions as we always do and i think the

359
00:11:35,030 --> 00:11:32,560
emotion will really hit on the runway

360
00:11:36,949 --> 00:11:35,040
after the mission is complete

361
00:11:38,949 --> 00:11:36,959
i tell each of the teams that each

362
00:11:40,389 --> 00:11:38,959
orbiter is my favorite so i really don't

363
00:11:41,910 --> 00:11:40,399

have a favorite

364
00:11:43,350 --> 00:11:41,920
and they give me grief over that all the

365
00:11:45,350 --> 00:11:43,360
time but uh

366
00:11:47,590 --> 00:11:45,360
um discovery's a great ship this is

367
00:11:49,670 --> 00:11:47,600
their 39th mission um

368
00:11:51,430 --> 00:11:49,680
would have quite a few left enter uh had

369
00:11:53,670 --> 00:11:51,440
the had the program been extended but it

370
00:11:55,829 --> 00:11:53,680
wasn't and so you know it's kind of

371
00:11:57,030 --> 00:11:55,839
bittersweet that uh we get the last

372
00:11:59,269 --> 00:11:57,040
flight out of her but she's going to

373
00:12:00,790 --> 00:11:59,279
perform perfectly fine on orbit and and

374
00:12:03,030 --> 00:12:00,800
bring the crew home safely and and i

375
00:12:05,110 --> 00:12:03,040
think on landing as a set landing day is

376
00:12:07,269 --> 00:12:05,120
going to be tough i i think

377
00:12:09,350 --> 00:12:07,279
landing day of discovery and then

378
00:12:12,150 --> 00:12:09,360
endeavoring especially atlantis the last

379
00:12:14,150 --> 00:12:12,160
mission um you'll see a lot of people on

380
00:12:15,829 --> 00:12:14,160
the runway that uh we'll probably choke

381
00:12:17,590 --> 00:12:15,839
up some because it it's it's the end of

382
00:12:19,750 --> 00:12:17,600
30-year program that

383
00:12:21,350 --> 00:12:19,760
that not only have we have we worked in

384
00:12:23,430 --> 00:12:21,360
and made our livelihoods in but we've

385
00:12:25,110 --> 00:12:23,440
we've grown to love and and appreciate

386
00:12:27,509 --> 00:12:25,120
and feel like we're doing something

387
00:12:29,430 --> 00:12:27,519
special for the country and and uh

388
00:12:32,230 --> 00:12:29,440

really the world and and so and it's

389
00:12:33,350 --> 00:12:32,240
coming to an end and that's tough um but

390
00:12:35,590 --> 00:12:33,360
we're going to do it right we're going

391
00:12:36,870 --> 00:12:35,600
to approach each of these three flights

392
00:12:38,629 --> 00:12:36,880
the way we've approached all the other

393
00:12:39,910 --> 00:12:38,639
ones and we'll pull them off and we'll

394
00:12:42,150 --> 00:12:39,920
be able to look back and be very very

395
00:12:44,949 --> 00:12:42,160
proud of what we've accomplished in the

396
00:12:52,230 --> 00:12:46,870
okay next question

397
00:12:55,110 --> 00:12:53,670
james dean with florida just just

398
00:12:56,629 --> 00:12:55,120
following up on that could you talk a

399
00:12:58,150 --> 00:12:56,639
little bit about the relationship that

400
00:13:00,389 --> 00:12:58,160
um

401
00:13:02,710 --> 00:13:00,399
teams uh processing teams have with each

402
00:13:03,990 --> 00:13:02,720
individual vehicle um

403
00:13:06,389 --> 00:13:04,000
you know you can joke that each one is

404
00:13:08,710 --> 00:13:06,399
your favorite but for the folks

405
00:13:11,590 --> 00:13:08,720
who for whom discovery is their vehicle

406
00:13:14,310 --> 00:13:11,600
um what it means to them to to

407
00:13:15,670 --> 00:13:14,320
for this to be the last flight yeah

408
00:13:17,750 --> 00:13:15,680
you should really probably ask those

409
00:13:19,829 --> 00:13:17,760
folks themselves uh they'd give they'd

410
00:13:21,030 --> 00:13:19,839
give you a much more personal answer but

411
00:13:23,030 --> 00:13:21,040
there have been people that worked

412
00:13:26,150 --> 00:13:23,040
exclusively on discovery for for many

413
00:13:28,310 --> 00:13:26,160

many years 12 12 15 20 years but only

414
00:13:29,750 --> 00:13:28,320
been on discovery they know they know

415
00:13:31,670 --> 00:13:29,760
that ship like the back of their hand

416
00:13:34,470 --> 00:13:31,680
literally and and so it's going to be

417
00:13:36,870 --> 00:13:34,480
even tougher for them to let go

418
00:13:38,949 --> 00:13:36,880
but here again you know it's a machine

419
00:13:41,030 --> 00:13:38,959
we grow to love them they perform

420
00:13:43,350 --> 00:13:41,040
extremely well for the for the program

421
00:13:45,189 --> 00:13:43,360
and the nation and um it's going to be a

422
00:13:46,710 --> 00:13:45,199
little tough yeah but i would encourage

423
00:13:48,470 --> 00:13:46,720
you ask you know stephanie stillson the

424
00:13:51,030 --> 00:13:48,480
flow director wayne bingham the flow

425
00:13:52,790 --> 00:13:51,040
manager and especially the folks down

426
00:13:54,069 --> 00:13:52,800
the floor of the opf and the va being

427
00:13:55,509 --> 00:13:54,079
out the pad who get to crawl around

428
00:13:58,069 --> 00:13:55,519
inside the vehicles and get to know the

429
00:13:59,670 --> 00:13:58,079
nuances of them because they are uh they

430
00:14:01,910 --> 00:13:59,680
look very very similar on the outside of

431
00:14:03,509 --> 00:14:01,920
course each one is unique just to a

432
00:14:05,189 --> 00:14:03,519
certain extent and those would be the

433
00:14:07,430 --> 00:14:05,199
people to be able to tell you all the

434
00:14:10,790 --> 00:14:07,440
all the stories about discovery and and

435
00:14:12,550 --> 00:14:10,800
uh little nuances about the ship

436
00:14:16,870 --> 00:14:12,560
irene

437
00:14:17,910 --> 00:14:16,880
mike moses or mike lineback i have two

438
00:14:19,670 --> 00:14:17,920

questions

439
00:14:21,030 --> 00:14:19,680
the first is

440
00:14:27,350 --> 00:14:21,040
the

441
00:14:30,069 --> 00:14:27,360
follow-on contracts was to

442
00:14:31,990 --> 00:14:30,079
keep the shuttles flying and operational

443
00:14:34,150 --> 00:14:32,000
in a in a commercial

444
00:14:35,670 --> 00:14:34,160
realm and i think the proposal was just

445
00:14:37,829 --> 00:14:35,680
to do a study so

446
00:14:39,829 --> 00:14:37,839
um is there anything that's going to be

447
00:14:41,750 --> 00:14:39,839
different from what had been planned

448
00:14:43,430 --> 00:14:41,760
previously in case nasa does end up

449
00:14:45,509 --> 00:14:43,440
selecting that for

450
00:14:47,670 --> 00:14:45,519
funding and then the second question is

451
00:14:49,030 --> 00:14:47,680
um once discovery is

452
00:14:51,750 --> 00:14:49,040
lands and

453
00:14:52,949 --> 00:14:51,760
goes through its standard post

454
00:14:56,069 --> 00:14:52,959
flight

455
00:14:59,110 --> 00:14:56,079
processing how many people will be

456
00:15:01,509 --> 00:14:59,120
will be given their notices to uh not

457
00:15:03,030 --> 00:15:01,519
come to work anymore thanks

458
00:15:04,870 --> 00:15:03,040
let's see on the uh

459
00:15:07,030 --> 00:15:04,880
on on the

460
00:15:08,470 --> 00:15:07,040
the proposal out there to look at a

461
00:15:10,310 --> 00:15:08,480
commercial company wanting to continue

462
00:15:12,870 --> 00:15:10,320
to fly shuttle is a commercial

463
00:15:15,030 --> 00:15:12,880

uh endeavor is is actually a proposal

464
00:15:16,550 --> 00:15:15,040
being submitted under our ccdev2

465
00:15:18,310 --> 00:15:16,560
contract and so therefore it's in a

466
00:15:20,389 --> 00:15:18,320
blackout and i'm not allowed to talk

467
00:15:22,230 --> 00:15:20,399
about it but uh some misconceptions are

468
00:15:23,590 --> 00:15:22,240
out there is it's not a nasa study

469
00:15:25,430 --> 00:15:23,600
that's undergoing that's a that's a

470
00:15:27,910 --> 00:15:25,440
private proposal to go

471
00:15:29,590 --> 00:15:27,920
use our hardware so we provided details

472
00:15:31,509 --> 00:15:29,600
and informations on costs but the

473
00:15:33,189 --> 00:15:31,519
proposal is not ours and and we are not

474
00:15:34,470 --> 00:15:33,199
allowed to comment on it since it is a

475
00:15:36,150 --> 00:15:34,480
contract that's currently under

476
00:15:37,749 --> 00:15:36,160
evaluation

477
00:15:39,430 --> 00:15:37,759
as far as the layoffs there's no planned

478
00:15:42,310 --> 00:15:39,440
layoff specifically targeted to

479
00:15:44,310 --> 00:15:42,320
discovery's last mission it's a it's a

480
00:15:46,870 --> 00:15:44,320
burn down profile that we've had for for

481
00:15:50,150 --> 00:15:46,880
many many years there's a layoff coming

482
00:15:52,230 --> 00:15:50,160
in for the usa team in april which was a

483
00:15:53,990 --> 00:15:52,240
planned uh

484
00:15:55,749 --> 00:15:54,000
step down in function just as we went

485
00:15:57,509 --> 00:15:55,759
through the profile so just because

486
00:15:59,910 --> 00:15:57,519
discovery lands and is done that doesn't

487
00:16:01,590 --> 00:15:59,920
change our our workforce profiles uh we

488
00:16:02,949 --> 00:16:01,600

kind of we've gotten down to about the

489
00:16:04,550 --> 00:16:02,959
minimum now and we're going to stay on

490
00:16:05,749 --> 00:16:04,560
that that profile pretty much through

491
00:16:08,230 --> 00:16:05,759
the end of the program when we get the

492
00:16:09,350 --> 00:16:08,240
wheel stop for atlantis

493
00:16:10,310 --> 00:16:09,360
and i would just i would just add a

494
00:16:11,269 --> 00:16:10,320
little bit

495
00:16:13,189 --> 00:16:11,279
we have

496
00:16:14,790 --> 00:16:13,199
this thing called the shuttle workforce

497
00:16:16,310 --> 00:16:14,800
council where we get together as a

498
00:16:18,470 --> 00:16:16,320
management team once a month and look at

499
00:16:20,069 --> 00:16:18,480
the critical skills in the program

500
00:16:22,389 --> 00:16:20,079
uh across the program from the

501
00:16:23,430 --> 00:16:22,399
processing folks to the to the launch

502
00:16:25,670 --> 00:16:23,440
team

503
00:16:27,910 --> 00:16:25,680
you know to the support services

504
00:16:29,829 --> 00:16:27,920
and so we're confident that that even

505
00:16:30,870 --> 00:16:29,839
with the layoff coming in in early april

506
00:16:33,430 --> 00:16:30,880
that we're going to be able to fly the

507
00:16:35,430 --> 00:16:33,440
last two missions perfectly safely and

508
00:16:37,990 --> 00:16:35,440
there is no other plan layoff until

509
00:16:39,749 --> 00:16:38,000
until the wheel stop of the of the final

510
00:16:42,629 --> 00:16:39,759
mission plus a plus a few weeks i

511
00:16:44,949 --> 00:16:43,749
yeah and i knew you were gonna ask that

512
00:16:46,069 --> 00:16:44,959
i didn't bring that part of my packet

513
00:16:48,790 --> 00:16:46,079

with me i don't know if you guys have

514
00:16:51,990 --> 00:16:48,800
that hand you have the layoff coming i i

515
00:16:53,350 --> 00:16:52,000
wouldn't want to guess at the number so

516
00:16:56,870 --> 00:16:53,360
bill

517
00:16:58,470 --> 00:16:56,880
and it's for one of the mics maybe both

518
00:17:00,389 --> 00:16:58,480
i'm not sure but

519
00:17:01,749 --> 00:17:00,399
for mike leinbach looking back on this

520
00:17:03,749 --> 00:17:01,759
processing flow i know it's the second

521
00:17:05,189 --> 00:17:03,759
longest vertical flow but would you make

522
00:17:06,789 --> 00:17:05,199
this would this be the most challenging

523
00:17:09,189 --> 00:17:06,799
thing you guys have ever done in flow i

524
00:17:11,429 --> 00:17:09,199
know the hydrogen leaks back on 35 are a

525
00:17:13,750 --> 00:17:11,439
big deal and a related question i'm just

526
00:17:15,590 --> 00:17:13,760
trying to see how this stands in the

527
00:17:17,590 --> 00:17:15,600
constellation of shuttle challenges you

528
00:17:19,669 --> 00:17:17,600
guys have had um and the related

529
00:17:20,949 --> 00:17:19,679
question is you know if this was a

530
00:17:22,630 --> 00:17:20,959
couple of years ago this happened you

531
00:17:23,429 --> 00:17:22,640
had tanks and flow would you have done

532
00:17:24,789 --> 00:17:23,439
this

533
00:17:26,470 --> 00:17:24,799
would you have would you have tried to

534
00:17:28,549 --> 00:17:26,480
modify a tank i know it's hindsight but

535
00:17:29,990 --> 00:17:28,559
i'm just curious what how this stands in

536
00:17:32,070 --> 00:17:30,000
that regard and i got one quick

537
00:17:34,070 --> 00:17:32,080
follow-up i'll let mike take the uh what

538
00:17:35,350 --> 00:17:34,080

would we have done years ago with other

539
00:17:37,909 --> 00:17:35,360
tanks question

540
00:17:39,110 --> 00:17:37,919
um but the processing flow for discovery

541
00:17:40,630 --> 00:17:39,120
you know other than the people working

542
00:17:42,549 --> 00:17:40,640
on the tank itself

543
00:17:44,390 --> 00:17:42,559
uh the work on discovery has been very

544
00:17:46,870 --> 00:17:44,400
really pretty minor during during this

545
00:17:48,870 --> 00:17:46,880
downtime we've made sure that all items

546
00:17:50,789 --> 00:17:48,880
that have a time limit on them have been

547
00:17:52,310 --> 00:17:50,799
changed out and ready to go

548
00:17:54,070 --> 00:17:52,320
we've looked at all of our requirements

549
00:17:55,510 --> 00:17:54,080
on the books and and make sure that

550
00:17:57,669 --> 00:17:55,520
we're ready to go plus a few months in

551
00:17:59,669 --> 00:17:57,679
case we do end up scrubbing again so

552
00:18:01,750 --> 00:17:59,679
most of the team really has not been

553
00:18:03,190 --> 00:18:01,760
taxed that that uh heavily during this

554
00:18:04,870 --> 00:18:03,200
during his downtime

555
00:18:07,510 --> 00:18:04,880
that's not true of the external tank

556
00:18:09,270 --> 00:18:07,520
processing people they they worked 24

557
00:18:10,390 --> 00:18:09,280
hours a day seven days a week through

558
00:18:11,430 --> 00:18:10,400
christmas

559
00:18:15,350 --> 00:18:11,440
and

560
00:18:17,669 --> 00:18:15,360
folks are

561
00:18:19,110 --> 00:18:17,679
to be commended to the to the maximum

562
00:18:21,270 --> 00:18:19,120
they put in an effort that's

563
00:18:22,789 --> 00:18:21,280

unbelievable

564
00:18:24,310 --> 00:18:22,799
you look back on this particular problem

565
00:18:25,909 --> 00:18:24,320
this was a very very difficult problem

566
00:18:27,430 --> 00:18:25,919
to to resolve

567
00:18:29,430 --> 00:18:27,440
the hydrogen leaks was it was a very

568
00:18:30,950 --> 00:18:29,440
difficult problem to resolve as well

569
00:18:32,470 --> 00:18:30,960
where would they stack up they're

570
00:18:36,950 --> 00:18:32,480
probably the two most

571
00:18:38,470 --> 00:18:36,960
issues the shuttle program has faced

572
00:18:40,310 --> 00:18:38,480
that that i've been associated with

573
00:18:42,230 --> 00:18:40,320
since the early 80s

574
00:18:43,990 --> 00:18:42,240
and in both times you know we've we've

575
00:18:45,350 --> 00:18:44,000
come through we've we've taken our time

576
00:18:46,390 --> 00:18:45,360
we've fixed the problem we've flown

577
00:18:47,909 --> 00:18:46,400
again

578
00:18:50,710 --> 00:18:47,919
which is the mantra in the shuttle

579
00:18:52,070 --> 00:18:50,720
program find it fix it and fly it and uh

580
00:18:53,350 --> 00:18:52,080
so we've we've fixed the tank we're

581
00:18:55,590 --> 00:18:53,360
gonna fly it tomorrow and it's gonna

582
00:18:57,909 --> 00:18:55,600
perform perfectly fine

583
00:18:59,830 --> 00:18:57,919
and for the other tanks yes so let's see

584
00:19:01,510 --> 00:18:59,840
bill for for other tanks you know

585
00:19:02,710 --> 00:19:01,520
if we were back 10 years ago and still

586
00:19:06,470 --> 00:19:02,720
in production

587
00:19:09,430 --> 00:19:06,480
um we'd have probably a little more

588
00:19:11,270 --> 00:19:09,440

resources at hand to look at at

589
00:19:13,110 --> 00:19:11,280
material properties for for other tanks

590
00:19:14,310 --> 00:19:13,120
you know a lot of folks ask why didn't

591
00:19:16,310 --> 00:19:14,320
we just swap to one of the other tanks

592
00:19:18,230 --> 00:19:16,320
sitting in the vab and fly it instead

593
00:19:19,909 --> 00:19:18,240
and with this type of problem there was

594
00:19:21,909 --> 00:19:19,919
no no guarantee that another tank

595
00:19:23,270 --> 00:19:21,919
doesn't have a similar problem until we

596
00:19:25,190 --> 00:19:23,280
find out what that ultimate root cause

597
00:19:26,310 --> 00:19:25,200
was which really took us until after

598
00:19:27,909 --> 00:19:26,320
christmas

599
00:19:30,870 --> 00:19:27,919
we just didn't know what the actual

600
00:19:32,710 --> 00:19:30,880
driving uh concern was once you find it

601
00:19:34,390 --> 00:19:32,720
then you can look at modifying had we

602
00:19:36,390 --> 00:19:34,400
had a couple other tanks sitting around

603
00:19:38,310 --> 00:19:36,400
that that we could we could show weren't

604
00:19:40,710 --> 00:19:38,320
a problem or that we could have started

605
00:19:42,470 --> 00:19:40,720
modifying while still doing a root cause

606
00:19:44,310 --> 00:19:42,480
investigation we might have been able to

607
00:19:45,750 --> 00:19:44,320
fly a couple of weeks earlier than we

608
00:19:46,870 --> 00:19:45,760
are right now but i think we probably

609
00:19:47,750 --> 00:19:46,880
would have played it out just about the

610
00:19:49,110 --> 00:19:47,760
same

611
00:19:53,110 --> 00:19:49,120
the true

612
00:19:55,029 --> 00:19:53,120
was never fixing the tank it was

613
00:19:56,950 --> 00:19:55,039

understanding the problem and being sure

614
00:19:58,390 --> 00:19:56,960
that our fix was the right one to do so

615
00:20:00,710 --> 00:19:58,400
that that that was going to take as long

616
00:20:02,149 --> 00:20:00,720
as it took uh i'm sure the the analysis

617
00:20:03,990 --> 00:20:02,159
guys at math would have liked to have

618
00:20:05,990 --> 00:20:04,000
the workforce they had back then though

619
00:20:07,510 --> 00:20:06,000
to help them do the math um we were

620
00:20:09,350 --> 00:20:07,520
pretty skeleton force down there at the

621
00:20:12,789 --> 00:20:09,360
uh at the michoud planning at marshall

622
00:20:18,230 --> 00:20:12,799
but those guys really stepped up for us

623
00:20:23,190 --> 00:20:21,350
dan billow from wesh tv for mike moses

624
00:20:25,270 --> 00:20:23,200
what what sort of a moment will it be

625
00:20:28,470 --> 00:20:25,280
tomorrow morning when when cryogenics

626
00:20:30,230 --> 00:20:28,480
hit metal are are you uh you know so

627
00:20:32,870 --> 00:20:30,240
convinced by the testing that you've

628
00:20:34,230 --> 00:20:32,880
done that that you're fine or or is it

629
00:20:35,990 --> 00:20:34,240
that when you're going to find out that

630
00:20:37,190 --> 00:20:36,000
the fix worked

631
00:20:38,870 --> 00:20:37,200
you know we we know through all our

632
00:20:40,390 --> 00:20:38,880
testing and analysis that the the fix is

633
00:20:42,070 --> 00:20:40,400
going to hold no problem we've uh we've

634
00:20:43,830 --> 00:20:42,080
upped the the margins on that on that

635
00:20:45,830 --> 00:20:43,840
manifold and that flange

636
00:20:47,830 --> 00:20:45,840
uh enough that uh

637
00:20:48,950 --> 00:20:47,840
it's not going to crack so that's not to

638
00:20:50,789 --> 00:20:48,960

say we're not going to watch to make

639
00:20:52,470 --> 00:20:50,799
sure something unexpected doesn't happen

640
00:20:54,549 --> 00:20:52,480
we have all the right cameras all the

641
00:20:55,990 --> 00:20:54,559
right inspections in place but but just

642
00:20:58,070 --> 00:20:56,000
like the gup i'm not going to have any

643
00:20:59,830 --> 00:20:58,080
extra concerns when we uh when we get to

644
00:21:01,029 --> 00:20:59,840
the lux level in the in the lox tank

645
00:21:02,870 --> 00:21:01,039
that hits the flanger when we get all

646
00:21:04,070 --> 00:21:02,880
the way to the top of the the hydrogen

647
00:21:06,230 --> 00:21:04,080
tank and start vending off through the

648
00:21:07,909 --> 00:21:06,240
gup i'm i'm highly confident that both

649
00:21:09,669 --> 00:21:07,919
those problems are are behind us and not

650
00:21:12,950 --> 00:21:09,679
going to be an issue for us not to say

651
00:21:19,110 --> 00:21:14,870
kevin

652
00:21:20,230 --> 00:21:19,120
on that is there extra steps put in is

653
00:21:21,750 --> 00:21:20,240
there going to be an extra person out

654
00:21:23,350 --> 00:21:21,760
for the final inspection do you have

655
00:21:24,310 --> 00:21:23,360
more cameras out there looking at the

656
00:21:26,470 --> 00:21:24,320
crack

657
00:21:29,190 --> 00:21:26,480
areas of the tank yeah we've got we've

658
00:21:30,710 --> 00:21:29,200
got a couple extra cameras um i'll just

659
00:21:32,950 --> 00:21:30,720
walk you through the the inspection

660
00:21:34,230 --> 00:21:32,960
criteria or the inspection process

661
00:21:36,470 --> 00:21:34,240
really you know begins at the beginning

662
00:21:37,990 --> 00:21:36,480
of external tank loading the guys are in

663
00:21:39,909 --> 00:21:38,000

the firing room watching all the cameras

664
00:21:42,470 --> 00:21:39,919
we have at the launch pad

665
00:21:44,070 --> 00:21:42,480
uh very high definition we have infrared

666
00:21:45,350 --> 00:21:44,080
cameras looking for thermal leaks that

667
00:21:46,789 --> 00:21:45,360
type of thing

668
00:21:49,830 --> 00:21:46,799
so we'll be inspecting that tank for the

669
00:21:51,270 --> 00:21:49,840
full three hours of of load and then we

670
00:21:53,190 --> 00:21:51,280
send the final inspection team out to

671
00:21:55,110 --> 00:21:53,200
the pad and they will do their standard

672
00:21:56,870 --> 00:21:55,120
walk down from they'll stop at the at

673
00:21:58,710 --> 00:21:56,880
the mobile launcher zero level look up

674
00:22:00,230 --> 00:21:58,720
at the at the orbiter in the tank then

675
00:22:01,029 --> 00:22:00,240
they'll go to the top and work our way

676
00:22:02,710 --> 00:22:01,039
down

677
00:22:03,909 --> 00:22:02,720
same number of people as always same

678
00:22:05,510 --> 00:22:03,919
stops

679
00:22:07,190 --> 00:22:05,520
they do have a

680
00:22:08,870 --> 00:22:07,200
a special infrared camera they're taking

681
00:22:10,549 --> 00:22:08,880
out with them this time

682
00:22:13,350 --> 00:22:10,559
but we've trained on that no big issue

683
00:22:14,470 --> 00:22:13,360
there so it the the tank will get a 100

684
00:22:15,590 --> 00:22:14,480
inspection

685
00:22:17,110 --> 00:22:15,600
and um

686
00:22:19,270 --> 00:22:17,120
when the when the guys come back to the

687
00:22:21,510 --> 00:22:19,280
firing room and report out to us

688
00:22:22,549 --> 00:22:21,520

the tank will be will be what it is it's

689
00:22:24,149 --> 00:22:22,559
either going to be ready to go or

690
00:22:25,669 --> 00:22:24,159
they're going to be some issues we don't

691
00:22:27,350 --> 00:22:25,679
expect any issues at all but if there

692
00:22:29,669 --> 00:22:27,360
are we're going to find them and we'll

693
00:22:31,909 --> 00:22:29,679
talk about them and as we always do we

694
00:22:33,510 --> 00:22:31,919
have criteria for certain issues on the

695
00:22:35,270 --> 00:22:33,520
external tank if it's a frost ball

696
00:22:36,390 --> 00:22:35,280
typically they're go depending where

697
00:22:38,070 --> 00:22:36,400
they are

698
00:22:39,350 --> 00:22:38,080
if it's ice you know that could be a

699
00:22:40,789 --> 00:22:39,360
different problem

700
00:22:42,470 --> 00:22:40,799
obviously if there's if there's some

701
00:22:45,029 --> 00:22:42,480
foam issues that would cause us to talk

702
00:22:47,350 --> 00:22:45,039
quite a bit but but i assure you that

703
00:22:48,950 --> 00:22:47,360
this tank will will get a complete

704
00:22:50,710 --> 00:22:48,960
inspection both from the firing room and

705
00:22:54,310 --> 00:22:50,720
by the final inspection team out the pad

706
00:22:56,549 --> 00:22:54,320
before we committed a flight

707
00:23:01,110 --> 00:22:56,559
greg

708
00:23:03,510 --> 00:23:01,120
is probably from mike leinbach but maybe

709
00:23:05,669 --> 00:23:03,520
mike moses as well you referred earlier

710
00:23:07,510 --> 00:23:05,679
to nuances with discovery and you

711
00:23:09,669 --> 00:23:07,520
advised us to talk with people who deal

712
00:23:11,830 --> 00:23:09,679
with the flow on the floor but are there

713
00:23:13,990 --> 00:23:11,840

any nuances with which you're familiar

714
00:23:15,909 --> 00:23:14,000
that you can describe to us either of

715
00:23:17,750 --> 00:23:15,919
you

716
00:23:22,070 --> 00:23:17,760
i know one in discovery that i cannot

717
00:23:22,080 --> 00:23:27,430
and i don't have any for you

718
00:23:31,830 --> 00:23:29,990
in the back seated

719
00:23:33,669 --> 00:23:31,840
eric spivey with first coast news for

720
00:23:35,110 --> 00:23:33,679
either mike as people start seeing the

721
00:23:37,430 --> 00:23:35,120
headlines of the final flight for

722
00:23:38,870 --> 00:23:37,440
discovery they think of it perhaps as

723
00:23:40,710 --> 00:23:38,880
the beginning of the end could either of

724
00:23:42,549 --> 00:23:40,720
you just talk about do you agree with

725
00:23:44,149 --> 00:23:42,559
that assessment and what would be your

726
00:23:47,110 --> 00:23:44,159
thoughts today

727
00:23:49,190 --> 00:23:47,120
on or your message to them on the future

728
00:23:51,750 --> 00:23:49,200
of space exploration as they start

729
00:23:53,669 --> 00:23:51,760
seeing these headlines about this being

730
00:23:55,590 --> 00:23:53,679
the last flight for discovery and the

731
00:23:57,750 --> 00:23:55,600
last two flights coming up

732
00:23:58,710 --> 00:23:57,760
you want to go yeah well let's see um

733
00:23:59,590 --> 00:23:58,720
you know

734
00:24:01,750 --> 00:23:59,600
for us

735
00:24:03,590 --> 00:24:01,760
inside the shuttle program the the end

736
00:24:06,390 --> 00:24:03,600
so to speak has been planned and coming

737
00:24:07,750 --> 00:24:06,400
for for many many years um we've known

738
00:24:09,430 --> 00:24:07,760

this was happening we've we've planned

739
00:24:10,710 --> 00:24:09,440
it we've built the uh

740
00:24:11,750 --> 00:24:10,720
built the right way to go about doing it

741
00:24:13,510 --> 00:24:11,760
to make sure we maintain the right

742
00:24:14,710 --> 00:24:13,520
workforce and the right skill set mike

743
00:24:16,630 --> 00:24:14,720
kind of talked a little bit about how

744
00:24:18,630 --> 00:24:16,640
we're keeping tabs on things

745
00:24:20,390 --> 00:24:18,640
so this is kind of this has always been

746
00:24:21,909 --> 00:24:20,400
the plan so now that we're at the last

747
00:24:23,990 --> 00:24:21,919
flight of each vehicle

748
00:24:25,990 --> 00:24:24,000
me personally it's not really changed

749
00:24:28,070 --> 00:24:26,000
anything other than we're just now

750
00:24:29,190 --> 00:24:28,080
executing the plans we've had in place

751
00:24:31,269 --> 00:24:29,200
for so long

752
00:24:32,470 --> 00:24:31,279
from a public standpoint i am getting a

753
00:24:33,990 --> 00:24:32,480
little bit of that feedback from folks

754
00:24:35,990 --> 00:24:34,000
around the country that that know i work

755
00:24:37,269 --> 00:24:36,000
here and and have said that you know hey

756
00:24:39,830 --> 00:24:37,279
i saw that this was the last flight i

757
00:24:41,590 --> 00:24:39,840
didn't know we were done and uh and

758
00:24:44,630 --> 00:24:41,600
that's that goes you know cuts twofold

759
00:24:45,990 --> 00:24:44,640
right it it it surprises me that

760
00:24:47,269 --> 00:24:46,000
the news doesn't get out but we live in

761
00:24:49,430 --> 00:24:47,279
a very sheltered world down here in

762
00:24:51,750 --> 00:24:49,440
florida or back in houston where we're

763
00:24:53,430 --> 00:24:51,760

at marshall where where the community is

764
00:24:55,669 --> 00:24:53,440
all space related and everybody knows

765
00:24:57,110 --> 00:24:55,679
everything about the space program um

766
00:24:58,950 --> 00:24:57,120
and so when i go out to visit my sister

767
00:25:00,789 --> 00:24:58,960
or my family and i get to see what the

768
00:25:02,549 --> 00:25:00,799
rest of the real world looks like i i

769
00:25:03,750 --> 00:25:02,559
get out an awakening sometimes

770
00:25:05,029 --> 00:25:03,760
everybody's very supportive and it's

771
00:25:07,029 --> 00:25:05,039
always that same i can't believe we're

772
00:25:08,630 --> 00:25:07,039
going to stop flying shuttle what's next

773
00:25:09,909 --> 00:25:08,640
and uh and we're still working on the

774
00:25:12,630 --> 00:25:09,919
what's next part you know we have this

775
00:25:15,190 --> 00:25:12,640
path towards exploration uh with uh with

776
00:25:17,350 --> 00:25:15,200
developing the sls the uh the space

777
00:25:19,029 --> 00:25:17,360
launch system putting a multi-purpose

778
00:25:20,950 --> 00:25:19,039
crew vehicle on top of it funding

779
00:25:23,029 --> 00:25:20,960
commercial entities to help us get into

780
00:25:25,430 --> 00:25:23,039
leo low earth orbit in a little faster

781
00:25:28,390 --> 00:25:25,440
better cheaper way uh all that's a

782
00:25:29,750 --> 00:25:28,400
really good future for nasa it's just

783
00:25:31,350 --> 00:25:29,760
it's not the same as what we're doing

784
00:25:33,269 --> 00:25:31,360
right now which is launching shuttles

785
00:25:34,470 --> 00:25:33,279
every day so it's a different way of

786
00:25:36,149 --> 00:25:34,480
going about it

787
00:25:37,830 --> 00:25:36,159
there's no good or bad about it it's

788
00:25:39,669 --> 00:25:37,840

just it's we can't keep doing what we're

789
00:25:42,149 --> 00:25:39,679
doing with the budgets we have so this

790
00:25:43,269 --> 00:25:42,159
is this is the new future so again now

791
00:25:44,789 --> 00:25:43,279
that we're at last flight i don't

792
00:25:46,070 --> 00:25:44,799
personally really look at it too much

793
00:25:48,070 --> 00:25:46,080
differently i guess by the time we get

794
00:25:50,710 --> 00:25:48,080
to the last flight of atlantis i'll have

795
00:25:52,230 --> 00:25:50,720
to actually decide what office i move to

796
00:25:53,590 --> 00:25:52,240
after this so

797
00:25:55,350 --> 00:25:53,600
so at some point it'll become a personal

798
00:25:57,990 --> 00:25:55,360
thing for me but for right now like mike

799
00:25:59,510 --> 00:25:58,000
said we all buckle down and fly and and

800
00:26:00,870 --> 00:25:59,520
i think we'll stop at atlantis is about

801
00:26:02,630 --> 00:26:00,880
the first time any of us are actually

802
00:26:03,350 --> 00:26:02,640
going to look up and say okay now we're

803
00:26:05,669 --> 00:26:03,360
done

804
00:26:07,430 --> 00:26:05,679
what's next

805
00:26:10,789 --> 00:26:07,440
jay

806
00:26:13,750 --> 00:26:10,799
question

807
00:26:15,269 --> 00:26:13,760
if you need to rescue discovery's crew

808
00:26:17,110 --> 00:26:15,279
how many days do you need to get

809
00:26:20,149 --> 00:26:17,120
endeavour ready to go and get them in

810
00:26:22,549 --> 00:26:20,159
orbit and also the other day mike

811
00:26:24,789 --> 00:26:22,559
servantini was talking about if he had

812
00:26:27,110 --> 00:26:24,799
his druthers he would like to fly

813
00:26:28,590 --> 00:26:27,120

814
00:26:32,070 --> 00:26:28,600
in june and

815
00:26:34,549 --> 00:26:32,080
sts-135 in late august early september

816
00:26:36,710 --> 00:26:34,559
to get the latest that you need up there

817
00:26:38,470 --> 00:26:36,720
is any reason why you couldn't handle

818
00:26:40,070 --> 00:26:38,480
that laying off the people you're going

819
00:26:42,230 --> 00:26:40,080
to lay off in april

820
00:26:44,950 --> 00:26:42,240
uh the crew that you have on is good to

821
00:26:47,110 --> 00:26:44,960
the end of this fiscal year

822
00:26:49,909 --> 00:26:47,120
let's see so the first question about

823
00:26:52,789 --> 00:26:49,919
rescue atlantis is i believe from launch

824
00:26:55,350 --> 00:26:52,799
will be 59 days i'm sorry endeavor will

825
00:26:56,950 --> 00:26:55,360
be 59 days uh from this launch so from

826
00:27:00,789 --> 00:26:56,960
tomorrow we'll have 59 days till the

827
00:27:02,630 --> 00:27:00,799
planned launch of sts-134 um

828
00:27:04,710 --> 00:27:02,640
that's uh we stepped up a couple years

829
00:27:07,269 --> 00:27:04,720
ago to to our launch on need flight

830
00:27:09,350 --> 00:27:07,279
being just the next flow so so that

831
00:27:10,549 --> 00:27:09,360
means that in that flow there's time off

832
00:27:12,310 --> 00:27:10,559
there's contingency days there's

833
00:27:13,830 --> 00:27:12,320
holidays and if we're in a launch on

834
00:27:15,430 --> 00:27:13,840
need scenario we obviously wouldn't we

835
00:27:16,870 --> 00:27:15,440
wouldn't use those days

836
00:27:18,149 --> 00:27:16,880
but there's two pieces to launch i need

837
00:27:19,430 --> 00:27:18,159
there's to get the vehicle ready and out

838
00:27:21,350 --> 00:27:19,440

to the pad and then there's all the

839
00:27:23,029 --> 00:27:21,360
flight software and other prep products

840
00:27:24,630 --> 00:27:23,039
that go along with flying the shuttle

841
00:27:27,510 --> 00:27:24,640
some of those can be accelerated some

842
00:27:28,789 --> 00:27:27,520
can't so it's at least 59 days we could

843
00:27:30,070 --> 00:27:28,799
probably pull that back in and make it

844
00:27:31,350 --> 00:27:30,080
faster than that

845
00:27:33,830 --> 00:27:31,360
but right now the next launch is

846
00:27:35,750 --> 00:27:33,840
scheduled 59 days away i believe the

847
00:27:38,470 --> 00:27:35,760
consumable situation up on station gives

848
00:27:40,230 --> 00:27:38,480
them i think it's at 152 days of support

849
00:27:41,110 --> 00:27:40,240
and that's without rationing and any

850
00:27:42,789 --> 00:27:41,120
other

851
00:27:44,470 --> 00:27:42,799
or resupply that we would count on for

852
00:27:47,830 --> 00:27:44,480
that kind of thing so plenty of overlap

853
00:27:50,389 --> 00:27:47,840
on a on a crew rescue scenario

854
00:27:53,269 --> 00:27:50,399
and then the uh

855
00:27:54,870 --> 00:27:53,279
if we don't get to station

856
00:27:56,470 --> 00:27:54,880
how many days you need to get in there

857
00:27:57,750 --> 00:27:56,480
and go get them

858
00:28:01,350 --> 00:27:57,760
yes what i'm saying the next mission

859
00:28:02,789 --> 00:28:01,360
endeavor could be ready in 59 days to go

860
00:28:03,990 --> 00:28:02,799
but as we've done all the work to look

861
00:28:07,590 --> 00:28:04,000
at what we're going to do for a crew

862
00:28:09,110 --> 00:28:07,600
rescue on the last flight we really

863
00:28:11,750 --> 00:28:09,120

crew rescue launch on need is now

864
00:28:13,269 --> 00:28:11,760
basically in name only um we know of the

865
00:28:14,870 --> 00:28:13,279
plan we have the plan we know how we

866
00:28:16,950 --> 00:28:14,880
would execute it if we would do a soyuz

867
00:28:18,789 --> 00:28:16,960
based rescue where we basically let that

868
00:28:20,710 --> 00:28:18,799
crew on board and let soyuz rotations be

869
00:28:22,149 --> 00:28:20,720
able to bring them home it would be a

870
00:28:23,190 --> 00:28:22,159
longer timeframe until they're all back

871
00:28:25,269 --> 00:28:23,200
on the ground but it would be an

872
00:28:27,269 --> 00:28:25,279
acceptable acceptable plan for a rescue

873
00:28:28,789 --> 00:28:27,279
we haven't specifically looked at soil

874
00:28:30,389 --> 00:28:28,799
rescue for these missions we're saving

875
00:28:32,230 --> 00:28:30,399
it for the last one but the concept

876
00:28:33,029 --> 00:28:32,240
would work at any time

877
00:28:34,710 --> 00:28:33,039
um

878
00:28:35,909 --> 00:28:34,720
and then jay your last question i i had

879
00:28:38,149 --> 00:28:35,919
it there for a second i lost it so what

880
00:28:39,909 --> 00:28:38,159
was your second partner mike cerfandini

881
00:28:43,430 --> 00:28:39,919
said if he had his druthers he'd like to

882
00:28:45,029 --> 00:28:43,440
launch 34 in june and launch 35 in late

883
00:28:46,950 --> 00:28:45,039
august right so

884
00:28:48,310 --> 00:28:46,960
um one of the things

885
00:28:50,630 --> 00:28:48,320
i learned is we're doing manifest

886
00:28:51,990 --> 00:28:50,640
planning is everybody has a has

887
00:28:53,990 --> 00:28:52,000
some skin in the game and wants a little

888
00:28:55,669 --> 00:28:54,000

different thing uh suff would really

889
00:28:58,310 --> 00:28:55,679
obviously like his resupply as late as

890
00:29:00,710 --> 00:28:58,320
possible before the the big honking

891
00:29:01,830 --> 00:29:00,720
payload bay of the shuttle goes away

892
00:29:03,350 --> 00:29:01,840
and so

893
00:29:05,590 --> 00:29:03,360
he has this drive to do it as late as

894
00:29:06,870 --> 00:29:05,600
possible uh the the manifest and the

895
00:29:08,470 --> 00:29:06,880
flows down here have a thing the

896
00:29:09,990 --> 00:29:08,480
workforce doesn't play into it we'd be

897
00:29:12,470 --> 00:29:10,000
able to go longer i think what's really

898
00:29:14,230 --> 00:29:12,480
going to drive us is the budget um and

899
00:29:15,510 --> 00:29:14,240
and uh and not so much a workforce

900
00:29:18,070 --> 00:29:15,520
question but just a

901
00:29:19,669 --> 00:29:18,080
at some point the end's coming and does

902
00:29:21,269 --> 00:29:19,679
moving one month later change anything

903
00:29:23,110 --> 00:29:21,279
for the workforce or not

904
00:29:24,789 --> 00:29:23,120
no if it truly helps us out on station

905
00:29:26,870 --> 00:29:24,799
resupply and we have the money to do it

906
00:29:28,310 --> 00:29:26,880
then then sure we should do that uh if

907
00:29:29,750 --> 00:29:28,320
the money's not going to be there then

908
00:29:31,269 --> 00:29:29,760
we probably ought to just go when we're

909
00:29:33,350 --> 00:29:31,279
ready so that's going to be more of a

910
00:29:38,789 --> 00:29:33,360
headquarters budget action to see to see

911
00:29:44,870 --> 00:29:41,350
yes uh stefano golidan for italian

912
00:29:46,870 --> 00:29:44,880
television i have one question which

913
00:29:49,110 --> 00:29:46,880

probably will sound some simple too

914
00:29:51,029 --> 00:29:49,120
simplistic i don't know but i find it

915
00:29:53,190 --> 00:29:51,039
hard to understand why

916
00:29:55,590 --> 00:29:53,200
and a follow-on

917
00:29:56,950 --> 00:29:55,600
vehicle launch vehicle cannot be based

918
00:29:59,990 --> 00:29:56,960
on an e.t

919
00:30:02,950 --> 00:30:00,000
uh you know couple with two boosters and

920
00:30:05,830 --> 00:30:02,960
you know engines and cargo on top i mean

921
00:30:06,710 --> 00:30:05,840
obviously it sounds very you know i'm

922
00:30:13,430 --> 00:30:06,720
like

923
00:30:14,630 --> 00:30:13,440
understand a little bit more why it is

924
00:30:16,950 --> 00:30:14,640
so difficult

925
00:30:18,870 --> 00:30:16,960
well that actually is the uh the the

926
00:30:21,269 --> 00:30:18,880
design that we've kind of decided upon

927
00:30:22,950 --> 00:30:21,279
is a shuttle derived follow-on

928
00:30:24,310 --> 00:30:22,960
that uses the same size core as an

929
00:30:25,029 --> 00:30:24,320
external tank

930
00:30:28,310 --> 00:30:25,039
with

931
00:30:29,990 --> 00:30:28,320
to be replaced eventually

932
00:30:31,669 --> 00:30:30,000
by by a different set of engines but

933
00:30:33,029 --> 00:30:31,679
basically fly out the fleet of shuttle

934
00:30:35,669 --> 00:30:33,039
engines that we have

935
00:30:37,190 --> 00:30:35,679
using solid rocket motors on the sides

936
00:30:38,549 --> 00:30:37,200
they could be four segment to start with

937
00:30:40,310 --> 00:30:38,559
and expanded to five segment like we

938
00:30:42,230 --> 00:30:40,320

were planning on doing and have test

939
00:30:44,470 --> 00:30:42,240
experience with uh and then you put an

940
00:30:46,710 --> 00:30:44,480
upper stage and a and a crew module on

941
00:30:48,310 --> 00:30:46,720
top so that's effectively what we have

942
00:30:49,750 --> 00:30:48,320
baselined as our new

943
00:30:51,590 --> 00:30:49,760
space launch system

944
00:30:53,669 --> 00:30:51,600
the exact trade details

945
00:30:55,110 --> 00:30:53,679
is a different part of my job so i'm not

946
00:30:56,630 --> 00:30:55,120
i'm not in on all that as to how we

947
00:30:58,230 --> 00:30:56,640
trade it off and and why we pick one

948
00:30:59,909 --> 00:30:58,240
architecture over another

949
00:31:01,909 --> 00:30:59,919
and to say anything is a final decision

950
00:31:04,230 --> 00:31:01,919
is really not not fair because there are

951
00:31:06,070 --> 00:31:04,240
so many variables in play

952
00:31:07,269 --> 00:31:06,080
you got to look at total cost to get up

953
00:31:08,950 --> 00:31:07,279
and operating initially you got to look

954
00:31:10,470 --> 00:31:08,960
at life cycle cost you look at

955
00:31:11,669 --> 00:31:10,480
development costs and what's the right

956
00:31:12,549 --> 00:31:11,679
figure of merit that you want to trade

957
00:31:14,149 --> 00:31:12,559
on

958
00:31:15,990 --> 00:31:14,159
so those studies have happened they're

959
00:31:17,430 --> 00:31:16,000
still ongoing they'll probably keep

960
00:31:19,909 --> 00:31:17,440
going until we actually have a new

961
00:31:21,990 --> 00:31:19,919
vehicle sitting on the pad um there's

962
00:31:23,110 --> 00:31:22,000
actually a group of people at

963
00:31:25,509 --> 00:31:23,120

marshall and headquarters whose

964
00:31:27,350 --> 00:31:25,519
full-time job is to constantly design

965
00:31:28,950 --> 00:31:27,360
new launch vehicles and trade off their

966
00:31:30,789 --> 00:31:28,960
their pros and cons and so i think that

967
00:31:32,149 --> 00:31:30,799
that team will always have a job because

968
00:31:34,230 --> 00:31:32,159
we're always looking to expand and

969
00:31:36,310 --> 00:31:34,240
change and see what we can do better so

970
00:31:37,750 --> 00:31:36,320
so but yeah it's a follow-on vehicle's

971
00:31:39,269 --> 00:31:37,760
coming it's just you can't just throw

972
00:31:41,269 --> 00:31:39,279
the pieces together and hook them up and

973
00:31:43,350 --> 00:31:41,279
launch you got to go do all the analysis

974
00:31:45,029 --> 00:31:43,360
all the math and and and obviously work

975
00:31:46,789 --> 00:31:45,039
all the budget that goes with it

976
00:31:48,310 --> 00:31:46,799
i wish i could tell you that it doesn't

977
00:31:50,070 --> 00:31:48,320
take nearly as much time or money but

978
00:31:51,669 --> 00:31:50,080
that's apparently what it does yeah that

979
00:31:54,630 --> 00:31:51,679
was my question i mean

980
00:31:56,950 --> 00:31:54,640
why so much money when all of these

981
00:31:59,110 --> 00:31:56,960
systems or all these parts are proven

982
00:32:01,750 --> 00:31:59,120
and i understand that coupling them in

983
00:32:03,669 --> 00:32:01,760
in a different configuration may be a

984
00:32:05,509 --> 00:32:03,679
challenge but i

985
00:32:08,070 --> 00:32:05,519
what i wanted to know was i mean why

986
00:32:09,509 --> 00:32:08,080
would it take so long and so much money

987
00:32:10,549 --> 00:32:09,519
yeah i can't answer the specifics

988
00:32:12,389 --> 00:32:10,559

because i don't know the details of that

989
00:32:13,750 --> 00:32:12,399
new design and what drives it but just

990
00:32:15,190 --> 00:32:13,760
as an example

991
00:32:17,590 --> 00:32:15,200
in the main engine systems that you know

992
00:32:19,350 --> 00:32:17,600
the shuttle main engine is uh is is an

993
00:32:21,430 --> 00:32:19,360
amazing marvel of technology and it's

994
00:32:23,269 --> 00:32:21,440
running it at basically probably the

995
00:32:26,070 --> 00:32:23,279
peak performance of a liquid hydrogen

996
00:32:30,149 --> 00:32:28,630
turbo pump type based engine and there's

997
00:32:32,149 --> 00:32:30,159
not many more tweaks we could do to it

998
00:32:33,029 --> 00:32:32,159
and it's it's not sensitive but it's

999
00:32:34,630 --> 00:32:33,039
very

1000
00:32:36,549 --> 00:32:34,640
it likes to have a certain set of inlet

1001
00:32:38,230 --> 00:32:36,559
pressures and temperatures and it needs

1002
00:32:39,750 --> 00:32:38,240
its flow conditions to be right and

1003
00:32:41,590 --> 00:32:39,760
we've designed the whole main propulsion

1004
00:32:43,029 --> 00:32:41,600
system that feeds that propellant into a

1005
00:32:44,470 --> 00:32:43,039
set of three of them that are manifolded

1006
00:32:45,990 --> 00:32:44,480
together we know how we get the flow to

1007
00:32:48,630 --> 00:32:46,000
line up just right not have any

1008
00:32:50,470 --> 00:32:48,640
recirculation not have any cavitation

1009
00:32:52,470 --> 00:32:50,480
and bubbles in the line now you go make

1010
00:32:54,230 --> 00:32:52,480
it a five engine system that you got to

1011
00:32:56,310 --> 00:32:54,240
go redesign all that and

1012
00:32:58,230 --> 00:32:56,320
and because of the lessons we've learned

1013
00:33:00,070 --> 00:32:58,240

the hard way here at nasa is we want to

1014
00:33:01,750 --> 00:33:00,080
make sure we test and not just fly so

1015
00:33:02,950 --> 00:33:01,760
you want to go build that up in a test

1016
00:33:04,549 --> 00:33:02,960
article you want to put it in the stand

1017
00:33:06,789 --> 00:33:04,559
you want to run it and bang it against

1018
00:33:08,389 --> 00:33:06,799
now the engine itself we know is robust

1019
00:33:10,070 --> 00:33:08,399
but the engine's only as good as the as

1020
00:33:11,909 --> 00:33:10,080
the inlet conditions feeding it and so

1021
00:33:13,750 --> 00:33:11,919
that's just an example

1022
00:33:15,430 --> 00:33:13,760
space flight's complicated uh some of

1023
00:33:17,269 --> 00:33:15,440
the answers are easy some of them are

1024
00:33:18,710 --> 00:33:17,279
really hard just the uh you know we

1025
00:33:20,789 --> 00:33:18,720
could talk about the the thing scott

1026
00:33:23,110 --> 00:33:20,799
talked about today with the iss rack

1027
00:33:24,870 --> 00:33:23,120
it's a it's a brace with two turnbuckles

1028
00:33:26,470 --> 00:33:24,880
on it and a lock nut you'd think that's

1029
00:33:28,470 --> 00:33:26,480
a pretty simple load analysis to show

1030
00:33:30,070 --> 00:33:28,480
why that's okay but if you look at all

1031
00:33:32,149 --> 00:33:30,080
the different environments that it will

1032
00:33:34,470 --> 00:33:32,159
fly through the different configurations

1033
00:33:36,070 --> 00:33:34,480
how much stowage is is hard mounted to

1034
00:33:37,509 --> 00:33:36,080
it how much is soft mounted to it the

1035
00:33:39,509 --> 00:33:37,519
fact that the crew reconfigures it on

1036
00:33:40,789 --> 00:33:39,519
orbit all those pieces have to be looked

1037
00:33:41,669 --> 00:33:40,799
at to make sure we didn't do anything

1038
00:33:42,870 --> 00:33:41,679

wrong

1039
00:33:44,789 --> 00:33:42,880
and caused a problem that we didn't

1040
00:33:45,750 --> 00:33:44,799
expect and so you're going to go throw a

1041
00:33:50,630 --> 00:33:45,760
new vehicle together you want to make

1042
00:33:55,669 --> 00:33:52,389
jim siegel celebration independent

1043
00:33:58,870 --> 00:33:55,679
newspaper um i'm interested in if you

1044
00:34:01,750 --> 00:33:58,880
could maybe mike or mike uh describe a

1045
00:34:03,350 --> 00:34:01,760
few of the specific modifications that

1046
00:34:06,870 --> 00:34:03,360
are being made to

1047
00:34:08,790 --> 00:34:06,880
34 and 35 as a consequence of the issues

1048
00:34:11,430 --> 00:34:08,800
that came up on this flight

1049
00:34:13,669 --> 00:34:11,440
what specific processes or hardware were

1050
00:34:14,950 --> 00:34:13,679
revised are going to be changed

1051
00:34:17,589 --> 00:34:14,960
it's we're going to basically do the

1052
00:34:19,589 --> 00:34:17,599
same mechanical structural modification

1053
00:34:23,190 --> 00:34:19,599
to the external tank so on this external

1054
00:34:25,109 --> 00:34:23,200
tank we we pulled the foam off of the uh

1055
00:34:27,109 --> 00:34:25,119
the inner tank region where it bolts to

1056
00:34:28,790 --> 00:34:27,119
the uh oxygen tank that's the tank at

1057
00:34:30,310 --> 00:34:28,800
the top of the external tank so the

1058
00:34:31,750 --> 00:34:30,320
flange that goes around there at the top

1059
00:34:33,990 --> 00:34:31,760
of the inner tank

1060
00:34:35,430 --> 00:34:34,000
we remove that foam we go into the

1061
00:34:37,589 --> 00:34:35,440
stringer tops that are bolted right

1062
00:34:39,430 --> 00:34:37,599
there we take off

1063
00:34:41,589 --> 00:34:39,440

and drill out about five fasteners four

1064
00:34:43,669 --> 00:34:41,599
or five fasteners and add what we call a

1065
00:34:45,510 --> 00:34:43,679
radius block which is basically a

1066
00:34:47,430 --> 00:34:45,520
thin aluminum band

1067
00:34:49,510 --> 00:34:47,440
of metal that reinforces that area so

1068
00:34:52,710 --> 00:34:49,520
any load that gets added into that

1069
00:34:54,950 --> 00:34:52,720
system due to assembly or uh or

1070
00:34:57,190 --> 00:34:54,960
or at loading during cryoloading or

1071
00:34:59,190 --> 00:34:57,200
ascent loads gets absorbed and carried

1072
00:35:01,670 --> 00:34:59,200
by this extra reinforced band as opposed

1073
00:35:02,550 --> 00:35:01,680
to the potentially weak metal underneath

1074
00:35:03,829 --> 00:35:02,560
it

1075
00:35:05,190 --> 00:35:03,839
so that same modification will be

1076
00:35:07,030 --> 00:35:05,200
applied to the next two tanks we just

1077
00:35:12,310 --> 00:35:07,040
finished that modification for

1078
00:35:13,910 --> 00:35:12,320
uh et-131 et-122 which flies on sts-134

1079
00:35:16,790 --> 00:35:13,920
in a couple weeks we'll start that

1080
00:35:20,310 --> 00:35:16,800
modification on et-138 which is the tank

1081
00:35:21,910 --> 00:35:20,320
for sts-135 so from uh actual physical

1082
00:35:25,109 --> 00:35:21,920
modifications to the vehicles that's the

1083
00:35:26,870 --> 00:35:25,119
same mod gonna be on all three vehicles

1084
00:35:28,710 --> 00:35:26,880
okay come over here

1085
00:35:30,950 --> 00:35:28,720
james bond with uh niko nicodoga

1086
00:35:33,190 --> 00:35:30,960
question for uh

1087
00:35:36,230 --> 00:35:33,200
mike moses and uh for scott the first

1088
00:35:39,109 --> 00:35:36,240

one is has the russian soyuz fly round

1089
00:35:40,710 --> 00:35:39,119
been approved and if and when it is when

1090
00:35:41,750 --> 00:35:40,720
will that happen and will we see that

1091
00:35:43,270 --> 00:35:41,760
live

1092
00:35:45,510 --> 00:35:43,280
and the question for scott when is the

1093
00:35:48,390 --> 00:35:45,520
first opportunity that we'll see r2 on

1094
00:35:50,870 --> 00:35:48,400
the outside of the iss

1095
00:35:52,470 --> 00:35:50,880
so on the on the fly a fly around fly

1096
00:35:53,910 --> 00:35:52,480
out of the soyuz

1097
00:35:56,069 --> 00:35:53,920
we still have a lot of work to do the

1098
00:35:57,670 --> 00:35:56,079
russians are off building trajectories

1099
00:35:59,349 --> 00:35:57,680
we think we've narrowed in on on a

1100
00:36:02,150 --> 00:35:59,359
flight path that they would they would

1101
00:36:03,829 --> 00:36:02,160
then fly now it basically falls to the

1102
00:36:05,510 --> 00:36:03,839
the the resources team on the station

1103
00:36:07,109 --> 00:36:05,520
side to go look at at finding

1104
00:36:10,230 --> 00:36:07,119
appropriate for the attitude we need to

1105
00:36:12,310 --> 00:36:10,240
be in uh power loads and thermal uh

1106
00:36:14,069 --> 00:36:12,320
issues to say that we can we can we can

1107
00:36:15,750 --> 00:36:14,079
stay in that attitude for about the hour

1108
00:36:17,670 --> 00:36:15,760
that it would take to do this fly around

1109
00:36:19,510 --> 00:36:17,680
uh everybody expects that should work

1110
00:36:21,109 --> 00:36:19,520
but we got to go do all that math um and

1111
00:36:23,270 --> 00:36:21,119
that's going to take longer than before

1112
00:36:25,270 --> 00:36:23,280
launch so we kind of put the line in the

1113
00:36:27,430 --> 00:36:25,280

sand that by flight day six we need to

1114
00:36:29,030 --> 00:36:27,440
have made the decision uh and then we

1115
00:36:30,630 --> 00:36:29,040
would probably execute by adding an

1116
00:36:32,470 --> 00:36:30,640
extra day into the mission

1117
00:36:34,069 --> 00:36:32,480
either after flight day nine or after

1118
00:36:35,910 --> 00:36:34,079
flight day ten so in the flight day nine

1119
00:36:39,349 --> 00:36:35,920
or ten time frame is when we'd add a day

1120
00:36:40,710 --> 00:36:39,359
to go do this fly around um and so we'll

1121
00:36:42,550 --> 00:36:40,720
start talking about it pretty much as

1122
00:36:44,870 --> 00:36:42,560
soon as we get on orbit and get a status

1123
00:36:46,150 --> 00:36:44,880
every day uh and when if we know we're

1124
00:36:47,750 --> 00:36:46,160
ready to make the call we'll make it but

1125
00:36:50,470 --> 00:36:47,760
if we need to we'll go probably as late

1126
00:36:52,470 --> 00:36:50,480
as flight day six or so

1127
00:36:54,069 --> 00:36:52,480
just to do that fly around yeah the way

1128
00:36:55,990 --> 00:36:54,079
we laid it out is the the amount of

1129
00:36:57,430 --> 00:36:56,000
activities needed for the crew on orbit

1130
00:36:58,390 --> 00:36:57,440
uh we would need to add that extra day

1131
00:37:00,310 --> 00:36:58,400
in there to give them the time to

1132
00:37:03,109 --> 00:37:00,320
execute this maneuver

1133
00:37:05,190 --> 00:37:03,119
and as far as r2 is concerned i haven't

1134
00:37:07,270 --> 00:37:05,200
seen the latest plan forward for getting

1135
00:37:09,349 --> 00:37:07,280
him unpacked and set up in the lab but

1136
00:37:10,630 --> 00:37:09,359
it may take a couple of months to get to

1137
00:37:11,910 --> 00:37:10,640
that because there's an awful lot for

1138
00:37:13,829 --> 00:37:11,920

the crew to do with all the hardware

1139
00:37:15,430 --> 00:37:13,839
that we're flying up and it's a fairly

1140
00:37:17,190 --> 00:37:15,440
involved process to get him out of his

1141
00:37:18,470 --> 00:37:17,200
launch enclosure which you know is

1142
00:37:20,470 --> 00:37:18,480
pretty beefy and has got a lot of

1143
00:37:21,510 --> 00:37:20,480
fasteners that the crew has to undo and

1144
00:37:23,190 --> 00:37:21,520
then when they set him up they're going

1145
00:37:25,430 --> 00:37:23,200
to set him up in the u.s laboratory

1146
00:37:27,589 --> 00:37:25,440
along with a task board for him to to

1147
00:37:29,670 --> 00:37:27,599
manipulate uh there are no one there's

1148
00:37:32,470 --> 00:37:29,680
no intention of taking this version of

1149
00:37:33,510 --> 00:37:32,480
r2 outside that's maybe a follow-on

1150
00:37:35,190 --> 00:37:33,520
version

1151
00:37:37,030 --> 00:37:35,200
later on you know if we prove the

1152
00:37:38,870 --> 00:37:37,040
concept and prove that it works well

1153
00:37:40,790 --> 00:37:38,880
inside and we can control it make it do

1154
00:37:42,069 --> 00:37:40,800
what we wanted to do then ultimately

1155
00:37:43,910 --> 00:37:42,079
perhaps we can give it some more

1156
00:37:47,430 --> 00:37:43,920
challenging and dangerous tasks go do

1157
00:37:53,030 --> 00:37:49,829
space flight magazine one quick question

1158
00:37:54,870 --> 00:37:53,040
what exactly is the status of 135

1159
00:37:56,710 --> 00:37:54,880
whether it's been approved another

1160
00:37:58,470 --> 00:37:56,720
question is for um

1161
00:37:59,829 --> 00:37:58,480
the mikes and scott

1162
00:38:01,670 --> 00:37:59,839
can you talk a little bit about a

1163
00:38:03,910 --> 00:38:01,680

history of rolling the shuttle back with

1164
00:38:06,310 --> 00:38:03,920
the payload in there and not taking it

1165
00:38:07,750 --> 00:38:06,320
out and and why you don't have to check

1166
00:38:09,430 --> 00:38:07,760
the payload you said you didn't have to

1167
00:38:10,870 --> 00:38:09,440
check the payload in the in the cargo

1168
00:38:13,430 --> 00:38:10,880
bay at all

1169
00:38:14,470 --> 00:38:13,440
see so the 135 question um

1170
00:38:16,310 --> 00:38:14,480
we've done

1171
00:38:17,270 --> 00:38:16,320
in headquarters and with the shuttle

1172
00:38:18,790 --> 00:38:17,280
program

1173
00:38:20,630 --> 00:38:18,800
and our space operations mission

1174
00:38:22,710 --> 00:38:20,640
director the budget folks have have

1175
00:38:25,109 --> 00:38:22,720
cranked the numbers out and shown that

1176
00:38:26,150 --> 00:38:25,119
uh for uh for a cr that we would get

1177
00:38:27,829 --> 00:38:26,160
that would run through the end of the

1178
00:38:29,109 --> 00:38:27,839
year as a government funding bill if

1179
00:38:31,670 --> 00:38:29,119
that's the funding levels we get for

1180
00:38:33,270 --> 00:38:31,680
nasa uh we have a plan in place to be

1181
00:38:35,990 --> 00:38:33,280
able to shuffle the money around and

1182
00:38:37,270 --> 00:38:36,000
fund the flight of sts-135 so

1183
00:38:39,510 --> 00:38:37,280
uh

1184
00:38:41,190 --> 00:38:39,520
i'll i'll say it generically how i how i

1185
00:38:43,349 --> 00:38:41,200
portray it to the troops the the actual

1186
00:38:44,790 --> 00:38:43,359
math i don't understand but effectively

1187
00:38:46,950 --> 00:38:44,800
we've gotten the letter from

1188
00:38:49,190 --> 00:38:46,960

headquarters saying uh we will be able

1189
00:38:50,710 --> 00:38:49,200
to fly sts-135 regardless of what

1190
00:38:52,310 --> 00:38:50,720
happens with the nasa budget now there's

1191
00:38:53,910 --> 00:38:52,320
some caveats right they could slash our

1192
00:38:55,510 --> 00:38:53,920
budget and we'd have to go redo the math

1193
00:38:57,430 --> 00:38:55,520
but for the given scenarios we see

1194
00:38:58,950 --> 00:38:57,440
coming uh we we think we have a way to

1195
00:39:00,870 --> 00:38:58,960
fund this uh this mission to be able to

1196
00:39:02,710 --> 00:39:00,880
fly it so for all intents and purposes

1197
00:39:04,390 --> 00:39:02,720
we've switched to the that's now that's

1198
00:39:07,430 --> 00:39:04,400
an in that's a manifested mission it's

1199
00:39:09,270 --> 00:39:07,440
planned and we are launching sts-135

1200
00:39:11,270 --> 00:39:09,280
and as far as the rollback is concerned

1201
00:39:13,270 --> 00:39:11,280
this isn't the first time that we have

1202
00:39:14,630 --> 00:39:13,280
gone back to the vab with a payload on

1203
00:39:16,470 --> 00:39:14,640
board in the in the history of the

1204
00:39:18,150 --> 00:39:16,480
program it's been done a couple of times

1205
00:39:20,470 --> 00:39:18,160
i don't know exactly how many but it has

1206
00:39:22,069 --> 00:39:20,480
been done before and once we're secured

1207
00:39:24,230 --> 00:39:22,079
in the payload bay and in the fittings

1208
00:39:26,150 --> 00:39:24,240
uh it's a it's a relatively benign

1209
00:39:27,990 --> 00:39:26,160
environment for the payload elements

1210
00:39:30,069 --> 00:39:28,000
there's a condition purge running into

1211
00:39:32,950 --> 00:39:30,079
the payload bay keeps the hardware dry

1212
00:39:35,510 --> 00:39:32,960
and cool and uh and certainly the

1213
00:39:37,270 --> 00:39:35,520

vibration and loads environment is is

1214
00:39:39,589 --> 00:39:37,280
much less severe than what we see at

1215
00:39:40,870 --> 00:39:39,599
liftoff anyway and through ascent so

1216
00:39:43,109 --> 00:39:40,880
we're quite content to sit in the

1217
00:39:45,030 --> 00:39:43,119
orbiter for as long as is necessary and

1218
00:39:47,190 --> 00:39:45,040
ride around with it as as required in

1219
00:39:48,950 --> 00:39:47,200
fact for hurricane scenarios it would be

1220
00:39:50,950 --> 00:39:48,960
very common for us to stay on board and

1221
00:39:55,589 --> 00:39:50,960
go back with the vehicle if we had to

1222
00:40:01,030 --> 00:39:56,870
denise

1223
00:40:02,950 --> 00:40:01,040
marcia mentioned earlier discovery is

1224
00:40:05,270 --> 00:40:02,960
the fleet leader and i was wondering if

1225
00:40:07,270 --> 00:40:05,280
mike leinbach if um having flown the

1226
00:40:08,230 --> 00:40:07,280
most missions um and also the return to

1227
00:40:09,910 --> 00:40:08,240
flight missions how would you

1228
00:40:11,270 --> 00:40:09,920
characterize discovery space flying

1229
00:40:13,510 --> 00:40:11,280
career

1230
00:40:15,190 --> 00:40:13,520
well she's been an amazing machine

1231
00:40:16,150 --> 00:40:15,200
she's she's done everything we've asked

1232
00:40:18,069 --> 00:40:16,160
over

1233
00:40:20,069 --> 00:40:18,079
you mentioned the two return to flight

1234
00:40:21,589 --> 00:40:20,079
missions and those are special for the

1235
00:40:23,270 --> 00:40:21,599
processing team

1236
00:40:25,589 --> 00:40:23,280
in fact part of the tribute in the

1237
00:40:27,109 --> 00:40:25,599
firing room is is based on the fact that

1238
00:40:28,950 --> 00:40:27,119

that discovery flew both of the return

1239
00:40:30,790 --> 00:40:28,960
to flight missions and as you can

1240
00:40:32,550 --> 00:40:30,800
imagine getting uh the shuttle program

1241
00:40:35,109 --> 00:40:32,560
back to flying after an accident is no

1242
00:40:36,470 --> 00:40:35,119
small feat and uh so discovery came

1243
00:40:38,390 --> 00:40:36,480
through in flying colors on both of

1244
00:40:41,030 --> 00:40:38,400
those

1245
00:40:43,750 --> 00:40:41,040
she flies really really well i mean very

1246
00:40:45,589 --> 00:40:43,760
very few problems on orbit and i expect

1247
00:40:46,390 --> 00:40:45,599
that to be the same this time

1248
00:40:47,750 --> 00:40:46,400
and

1249
00:40:49,829 --> 00:40:47,760
again we'll turn it over to steve

1250
00:40:51,510 --> 00:40:49,839
lindsey and the crew at liftoff and and

1251
00:40:53,670 --> 00:40:51,520
the flight directors out of houston and

1252
00:40:55,829 --> 00:40:53,680
they'll perform the mission she'll

1253
00:40:58,150 --> 00:40:55,839
complete number 39 and then she'll be

1254
00:41:00,150 --> 00:40:58,160
retired

1255
00:41:01,670 --> 00:41:00,160
second rule please emily baldwin

1256
00:41:02,710 --> 00:41:01,680
astronomy now and my question's for

1257
00:41:04,150 --> 00:41:02,720
scott i was wondering if you could

1258
00:41:06,470 --> 00:41:04,160
elaborate on the different science

1259
00:41:07,670 --> 00:41:06,480
missions that you're uh you're flying on

1260
00:41:10,150 --> 00:41:07,680
this mission

1261
00:41:11,670 --> 00:41:10,160
okay well again uh robonaut 2 is one of

1262
00:41:13,910 --> 00:41:11,680
the investigations that we're flying

1263
00:41:15,990 --> 00:41:13,920

he's a big one and then express rack 8

1264
00:41:17,990 --> 00:41:16,000
which is back in the module is is a rack

1265
00:41:19,430 --> 00:41:18,000
that on orbit we can plug smaller

1266
00:41:21,510 --> 00:41:19,440
experiments into

1267
00:41:23,190 --> 00:41:21,520
it has a fridge freezer in it now that's

1268
00:41:25,190 --> 00:41:23,200
going uphill with us

1269
00:41:27,349 --> 00:41:25,200
up on the in the mid deck we have a

1270
00:41:29,589 --> 00:41:27,359
variety of different experiments first

1271
00:41:31,750 --> 00:41:29,599
of all we have some freezers fridge

1272
00:41:32,870 --> 00:41:31,760
freezers to bring back some samples from

1273
00:41:34,390 --> 00:41:32,880
on orbit

1274
00:41:36,390 --> 00:41:34,400
the crew has been collecting urine and

1275
00:41:37,910 --> 00:41:36,400
saliva samples blood samples over the

1276
00:41:39,910 --> 00:41:37,920
course of time and and we need to get

1277
00:41:41,190 --> 00:41:39,920
those back home in a conditioned state

1278
00:41:43,190 --> 00:41:41,200
so they'll be preserved for the

1279
00:41:44,630 --> 00:41:43,200
investigators on the ground

1280
00:41:46,790 --> 00:41:44,640
we're also launching two animal

1281
00:41:49,190 --> 00:41:46,800
enclosure modules each of those contain

1282
00:41:51,349 --> 00:41:49,200
eight mice and they will be studying

1283
00:41:53,829 --> 00:41:51,359
those mice and how they react to

1284
00:41:55,190 --> 00:41:53,839
basically a respiratory illness

1285
00:41:57,510 --> 00:41:55,200
rsv

1286
00:41:59,510 --> 00:41:57,520
we have a couple of national lab

1287
00:42:01,030 --> 00:41:59,520
pathfinder payloads these are payloads

1288
00:42:03,270 --> 00:42:01,040

that are in a series that are supposed

1289
00:42:05,030 --> 00:42:03,280
to be you know expanding our sphere from

1290
00:42:06,710 --> 00:42:05,040
outside of nasa you know getting other

1291
00:42:08,309 --> 00:42:06,720
folks involved and doing research on the

1292
00:42:09,910 --> 00:42:08,319
station

1293
00:42:12,790 --> 00:42:09,920
both of them are biological in their

1294
00:42:15,190 --> 00:42:12,800
nature we have a couple of

1295
00:42:16,870 --> 00:42:15,200
experiments associated with

1296
00:42:18,790 --> 00:42:16,880
materials processing

1297
00:42:21,030 --> 00:42:18,800
and seeing how materials react in the

1298
00:42:23,030 --> 00:42:21,040
unique microgravity environment and then

1299
00:42:26,470 --> 00:42:23,040
we have a very unique one that's looking

1300
00:42:28,790 --> 00:42:26,480
at the growth of fungi in space as you

1301
00:42:30,630 --> 00:42:28,800
may have heard we actually get fungi

1302
00:42:32,630 --> 00:42:30,640
growing on some of the surfaces in the

1303
00:42:34,390 --> 00:42:32,640
in the space station and so it's pretty

1304
00:42:36,150 --> 00:42:34,400
important that we learn how to combat

1305
00:42:37,750 --> 00:42:36,160
that and so this experiment will help

1306
00:42:40,710 --> 00:42:37,760
give us some more insight as to how to

1307
00:42:45,910 --> 00:42:42,550
robert

1308
00:42:47,670 --> 00:42:45,920
with a question i think from mike

1309
00:42:50,309 --> 00:42:47,680
leinbach um

1310
00:42:54,630 --> 00:42:50,319
with tomorrow's atv docking

1311
00:42:56,309 --> 00:42:54,640
just from a procedures standpoint um

1312
00:42:57,990 --> 00:42:56,319
is there a certain milestone in the in

1313
00:42:59,750 --> 00:42:58,000

the docking procedure soft dock hard

1314
00:43:00,790 --> 00:42:59,760
dock where you then can say well we

1315
00:43:02,790 --> 00:43:00,800
don't have to worry about this any

1316
00:43:04,550 --> 00:43:02,800
longer and is there someone within the

1317
00:43:06,069 --> 00:43:04,560
iss program the iss flight director that

1318
00:43:08,790 --> 00:43:06,079
needs to give you a

1319
00:43:10,309 --> 00:43:08,800
uh a go to say that this is um this is

1320
00:43:11,829 --> 00:43:10,319
now no longer a concern and you can

1321
00:43:12,790 --> 00:43:11,839
continue on with discovery's launch

1322
00:43:14,390 --> 00:43:12,800
thanks

1323
00:43:16,230 --> 00:43:14,400
yeah in fact we got a good uh good

1324
00:43:18,390 --> 00:43:16,240
update this morning from the iss program

1325
00:43:20,309 --> 00:43:18,400
that the atv has performed a couple of

1326
00:43:21,829 --> 00:43:20,319
of the major burns and they went fine

1327
00:43:23,430 --> 00:43:21,839
and so right now everything's on track

1328
00:43:25,270 --> 00:43:23,440
for a docking tomorrow

1329
00:43:27,190 --> 00:43:25,280
we will be fully fueled with the

1330
00:43:29,030 --> 00:43:27,200
external tank assuming we start on time

1331
00:43:31,109 --> 00:43:29,040
by the time they dock

1332
00:43:33,430 --> 00:43:31,119
they dock at 10 46 tomorrow we should be

1333
00:43:34,309 --> 00:43:33,440
done fueling at 10 25.

1334
00:43:35,670 --> 00:43:34,319
obviously we have a direct

1335
00:43:37,349 --> 00:43:35,680
communications path to the flight

1336
00:43:38,790 --> 00:43:37,359
directors in houston both on the shuttle

1337
00:43:41,190 --> 00:43:38,800
side and the station side they'll tell

1338
00:43:42,630 --> 00:43:41,200

us if there any issues being worked with

1339
00:43:44,550 --> 00:43:42,640
the docking itself

1340
00:43:45,430 --> 00:43:44,560
if they're minor in nature we'll press

1341
00:43:47,109 --> 00:43:45,440
on

1342
00:43:48,710 --> 00:43:47,119
if they turn out to be more significant

1343
00:43:50,150 --> 00:43:48,720
than the mission management team mike

1344
00:43:51,589 --> 00:43:50,160
will tell us

1345
00:43:53,109 --> 00:43:51,599
what the issue is and whether we need to

1346
00:43:55,670 --> 00:43:53,119
stand down for the day or whatever the

1347
00:43:57,430 --> 00:43:55,680
case may be so we've talked our our way

1348
00:43:58,870 --> 00:43:57,440
through that whole scenario we believe

1349
00:44:01,270 --> 00:43:58,880
we have a good plan in place to deal

1350
00:44:05,190 --> 00:44:01,280
with any any issues that may that may

1351
00:44:06,950 --> 00:44:05,200
develop not expecting any but again we

1352
00:44:08,309 --> 00:44:06,960
have good communications to those guys

1353
00:44:09,589 --> 00:44:08,319
in houston and they'll let us know

1354
00:44:12,630 --> 00:44:09,599
what's going on

1355
00:44:13,750 --> 00:44:12,640
throughout the whole countdown

1356
00:44:18,710 --> 00:44:13,760
todd

1357
00:44:21,270 --> 00:44:18,720
for mike and one for mike

1358
00:44:24,309 --> 00:44:21,280
for mike lineback i was wondering what

1359
00:44:26,870 --> 00:44:24,319
your thoughts are about um having one of

1360
00:44:29,670 --> 00:44:26,880
your own a former ksc person on board

1361
00:44:32,790 --> 00:44:29,680
it's only happened i think a handful of

1362
00:44:34,950 --> 00:44:32,800
times and for mike moses i was wondering

1363
00:44:38,069 --> 00:44:34,960

what impact there would be

1364
00:44:42,950 --> 00:44:38,079
on either launch or if you were on orbit

1365
00:44:46,550 --> 00:44:45,270
yeah you can have that one yeah

1366
00:44:49,270 --> 00:44:46,560
let's see

1367
00:44:50,630 --> 00:44:49,280
as far as as nikki goes a good friend

1368
00:44:53,430 --> 00:44:50,640
we've been friends for a long long time

1369
00:44:55,270 --> 00:44:53,440
but i remember as a test director and

1370
00:44:57,190 --> 00:44:55,280
she was an orbiter project engineer

1371
00:44:58,710 --> 00:44:57,200
essentially the chief engineer for a

1372
00:45:00,150 --> 00:44:58,720
particular vehicle

1373
00:45:03,510 --> 00:45:00,160
we work together in the firing room and

1374
00:45:05,430 --> 00:45:03,520
so we go a long long way back

1375
00:45:07,670 --> 00:45:05,440
she may be the luckiest person at kc to

1376
00:45:09,750 --> 00:45:07,680
become an astronaut and fly a couple of

1377
00:45:11,270 --> 00:45:09,760
times uh i may be the second luckiest

1378
00:45:13,829 --> 00:45:11,280
person at ksc to become a launch

1379
00:45:15,589 --> 00:45:13,839
director we go a long way back it'll be

1380
00:45:17,510 --> 00:45:15,599
very very cool to send her off again

1381
00:45:18,950 --> 00:45:17,520
tomorrow

1382
00:45:20,870 --> 00:45:18,960
and then on the uh on the government

1383
00:45:23,270 --> 00:45:20,880
shutdown question you know

1384
00:45:24,150 --> 00:45:23,280
way above my focus right now i'm looking

1385
00:45:25,910 --> 00:45:24,160
at that

1386
00:45:27,589 --> 00:45:25,920
technical readiness to fly so i don't i

1387
00:45:29,349 --> 00:45:27,599
don't know the answer to that one

1388
00:45:32,309 --> 00:45:29,359

um i'm sure someone's thought about it

1389
00:45:34,550 --> 00:45:32,319
though

1390
00:45:36,069 --> 00:45:34,560
marcia marcia done associated press for

1391
00:45:38,470 --> 00:45:36,079
mike leinbach again

1392
00:45:40,710 --> 00:45:38,480
how many months of once discovery is

1393
00:45:41,829 --> 00:45:40,720
back how many months do you expect the

1394
00:45:44,390 --> 00:45:41,839
routine

1395
00:45:46,470 --> 00:45:44,400
post flight stuff to take and how long

1396
00:45:48,950 --> 00:45:46,480
do you think it would be before you had

1397
00:45:50,470 --> 00:45:48,960
the shuttle ready to hand over to

1398
00:45:52,230 --> 00:45:50,480
the museum

1399
00:45:53,510 --> 00:45:52,240
well let's see we go through the the

1400
00:45:55,190 --> 00:45:53,520
standard

1401
00:45:56,630 --> 00:45:55,200
turnaround process and the safing of the

1402
00:45:58,550 --> 00:45:56,640
vehicle

1403
00:46:00,390 --> 00:45:58,560
if if for some chance we happen to land

1404
00:46:01,829 --> 00:46:00,400
in at the dryden flight research center

1405
00:46:03,990 --> 00:46:01,839
this time there are a couple of tasks we

1406
00:46:05,430 --> 00:46:04,000
will not perform out there just because

1407
00:46:07,670 --> 00:46:05,440
we don't need to to get ready for the

1408
00:46:08,870 --> 00:46:07,680
next flight for for another flight so

1409
00:46:10,870 --> 00:46:08,880
we'll get her back here it'll probably

1410
00:46:11,829 --> 00:46:10,880
be about three weeks or so of standard

1411
00:46:13,270 --> 00:46:11,839
uh

1412
00:46:15,430 --> 00:46:13,280
mission safing

1413
00:46:16,950 --> 00:46:15,440

um certain payload mid decks we're gonna

1414
00:46:17,910 --> 00:46:16,960
have to take out for scott those types

1415
00:46:19,349 --> 00:46:17,920
of things

1416
00:46:21,030 --> 00:46:19,359
um but

1417
00:46:23,109 --> 00:46:21,040
we're gonna take our time we're not

1418
00:46:24,950 --> 00:46:23,119
gonna rush we've we've got a plan laid

1419
00:46:26,630 --> 00:46:24,960
out we have a whole team called the

1420
00:46:28,790 --> 00:46:26,640
transition and retirement team in fact

1421
00:46:31,109 --> 00:46:28,800
stephanie stillson's leading discoveries

1422
00:46:32,550 --> 00:46:31,119
uh tnr team and she has a very very

1423
00:46:34,309 --> 00:46:32,560
detailed plan that goes out several

1424
00:46:36,630 --> 00:46:34,319
months to to get the vehicle ready and

1425
00:46:38,150 --> 00:46:36,640
safe and and get in a position where we

1426
00:46:39,510 --> 00:46:38,160
where we could turn it over to somebody

1427
00:46:40,950 --> 00:46:39,520
else we're not gonna we're not gonna

1428
00:46:42,790 --> 00:46:40,960
we're not gonna rush through it we'll

1429
00:46:44,470 --> 00:46:42,800
take our time but

1430
00:46:46,630 --> 00:46:44,480
i think it's mid-summer something like

1431
00:46:49,990 --> 00:46:46,640
that we show on on paper that it could

1432
00:46:52,630 --> 00:46:50,000
be ready to go something like that

1433
00:46:54,870 --> 00:46:52,640
irene irene klotz with reuters i have

1434
00:46:56,630 --> 00:46:54,880
two questions for mike moses

1435
00:46:58,470 --> 00:46:56,640
since this is uh discovery's last trip

1436
00:47:00,630 --> 00:46:58,480
to the space station is there anything

1437
00:47:02,309 --> 00:47:00,640
on the shuttle that it won't be needing

1438
00:47:05,349 --> 00:47:02,319

for flight anymore that's going to be

1439
00:47:06,230 --> 00:47:05,359
left on the out on the station

1440
00:47:07,430 --> 00:47:06,240
um

1441
00:47:09,829 --> 00:47:07,440
no yeah we don't we don't have any

1442
00:47:11,670 --> 00:47:09,839
planned scavenge type activities i know

1443
00:47:12,309 --> 00:47:11,680
we're doing standard resupply changeouts

1444
00:47:15,510 --> 00:47:12,319
of

1445
00:47:17,190 --> 00:47:15,520
stuff like that but

1446
00:47:19,589 --> 00:47:17,200
but no nothing nothing that's a

1447
00:47:20,870 --> 00:47:19,599
dedicated you can strip the vehicle

1448
00:47:23,030 --> 00:47:20,880
because we're not flying it again kind

1449
00:47:24,710 --> 00:47:23,040
of plan

1450
00:47:27,589 --> 00:47:24,720
for scott um what's the status of the

1451
00:47:28,390 --> 00:47:27,599
payloads for sts-135

1452
00:47:33,030 --> 00:47:28,400
okay

1453
00:47:35,270 --> 00:47:33,040
135 we have a fm2 rafaello

1454
00:47:37,510 --> 00:47:35,280
mplm it's going to fly up and back and

1455
00:47:39,270 --> 00:47:37,520
this will be our last chance to bring

1456
00:47:41,990 --> 00:47:39,280
big things home

1457
00:47:44,390 --> 00:47:42,000
internal things home and that module is

1458
00:47:46,150 --> 00:47:44,400
in its processing campaign right now and

1459
00:47:47,349 --> 00:47:46,160
they're in the process of getting racks

1460
00:47:49,829 --> 00:47:47,359
installed they've already been through

1461
00:47:52,390 --> 00:47:49,839
their subsystem testing it's proceeding

1462
00:47:54,870 --> 00:47:52,400
very well and joe delay and his team are

1463
00:47:56,150 --> 00:47:54,880

on track to go fly in in june also

1464
00:47:57,910 --> 00:47:56,160
flying on that mission we have a

1465
00:48:00,150 --> 00:47:57,920
lightweight impess carrier

1466
00:48:03,750 --> 00:48:00,160
in the back that's going to have

1467
00:48:05,190 --> 00:48:03,760
a payload on it it's a refueling payload

1468
00:48:07,510 --> 00:48:05,200
that we're going to fly that goddard has

1469
00:48:09,910 --> 00:48:07,520
developed that we can go practice some

1470
00:48:11,990 --> 00:48:09,920
of the techniques to robotically refuel

1471
00:48:13,510 --> 00:48:12,000
spacecraft in the future and also

1472
00:48:14,470 --> 00:48:13,520
there's an ammonia tank assembly the

1473
00:48:15,750 --> 00:48:14,480
assembly that we're going to be

1474
00:48:17,270 --> 00:48:15,760
launching with

1475
00:48:19,109 --> 00:48:17,280
several hundred pounds of anhydrous

1476
00:48:21,270 --> 00:48:19,119
ammonia that we'll be leaving behind and

1477
00:48:23,109 --> 00:48:21,280
all of that hardware is is proceeding

1478
00:48:27,750 --> 00:48:23,119
well towards that launch wherever that

1479
00:48:33,430 --> 00:48:28,950
james

1480
00:48:34,549 --> 00:48:33,440
scott and one for mike limbach scott as

1481
00:48:36,069 --> 00:48:34,559
well as

1482
00:48:37,270 --> 00:48:36,079
this being discovery's last flight it'll

1483
00:48:40,230 --> 00:48:37,280
be the last for

1484
00:48:41,670 --> 00:48:40,240
leonardo um last in a shuttle anyway so

1485
00:48:43,109 --> 00:48:41,680
um i just wondered if you could talk a

1486
00:48:45,349 --> 00:48:43,119
little bit about the mods that you made

1487
00:48:46,870 --> 00:48:45,359
to uh get it ready for long duration

1488
00:48:49,589 --> 00:48:46,880

flight and and what it's like from the

1489
00:48:52,390 --> 00:48:49,599
payload side of things to uh have one of

1490
00:48:54,390 --> 00:48:52,400
your long-term uh pieces of hardware uh

1491
00:48:56,870 --> 00:48:54,400
to have to say goodbye to that leave the

1492
00:48:58,549 --> 00:48:56,880
nest and not come home yeah um

1493
00:49:01,030 --> 00:48:58,559
let's see uh leonardo has been part of

1494
00:49:03,109 --> 00:49:01,040
our family for over a decade and so in

1495
00:49:05,510 --> 00:49:03,119
some respects it's going to be you know

1496
00:49:07,990 --> 00:49:05,520
sad to see him go but then

1497
00:49:09,430 --> 00:49:08,000
on the other hand it's he's going to a

1498
00:49:11,190 --> 00:49:09,440
better place he's going to be left

1499
00:49:12,710 --> 00:49:11,200
behind on the station

1500
00:49:14,309 --> 00:49:12,720
i can't believe this i can't believe i

1501
00:49:15,750 --> 00:49:14,319
said that either but you know we're

1502
00:49:18,069 --> 00:49:15,760
going to we're going to actually put put

1503
00:49:20,230 --> 00:49:18,079
it to use long term and uh i did the

1504
00:49:23,030 --> 00:49:20,240
math a while back and and figured out

1505
00:49:25,430 --> 00:49:23,040
that so far leonardo only has 40 million

1506
00:49:27,190 --> 00:49:25,440
miles on it you know that's a cream puff

1507
00:49:29,030 --> 00:49:27,200
as far as spacecraft go

1508
00:49:31,990 --> 00:49:29,040
91 days in orbit but we're going to

1509
00:49:34,390 --> 00:49:32,000
leave it up there for 10 years or more

1510
00:49:36,470 --> 00:49:34,400
and if i did the math right that equates

1511
00:49:37,670 --> 00:49:36,480
to about one and a half billion miles

1512
00:49:39,990 --> 00:49:37,680
that we're going to put on it over the

1513
00:49:41,510 --> 00:49:40,000

course of time and so maybe even you

1514
00:49:42,870 --> 00:49:41,520
know by the time i'm ready to retire

1515
00:49:45,030 --> 00:49:42,880
it'll still be up there flying around

1516
00:49:46,790 --> 00:49:45,040
the earth so it's not gone it's not

1517
00:49:49,190 --> 00:49:46,800
sitting in a museum somewhere it's in

1518
00:49:50,549 --> 00:49:49,200
space where all spacecraft belong so

1519
00:49:52,470 --> 00:49:50,559
that's that's something that makes takes

1520
00:49:54,549 --> 00:49:52,480
the edge off a little bit there um as

1521
00:49:56,150 --> 00:49:54,559
far as the mods that were performed to

1522
00:49:58,470 --> 00:49:56,160
it we um

1523
00:50:00,309 --> 00:49:58,480
the primary modification was to armor it

1524
00:50:02,950 --> 00:50:00,319
up a little bit so that it can withstand

1525
00:50:04,470 --> 00:50:02,960
the micrometeoroid and space debris flux

1526
00:50:05,910 --> 00:50:04,480
that you'll see over that 10-year

1527
00:50:09,030 --> 00:50:05,920
lifetime in space

1528
00:50:11,990 --> 00:50:09,040
so there was a very clever design

1529
00:50:14,630 --> 00:50:12,000
that the italians and we came up with to

1530
00:50:16,230 --> 00:50:14,640
to place some nextil kevlar fabric

1531
00:50:18,470 --> 00:50:16,240
panels underneath some of the debris

1532
00:50:20,549 --> 00:50:18,480
shields to give us that extra armor that

1533
00:50:22,069 --> 00:50:20,559
we need to protect the module we also

1534
00:50:23,510 --> 00:50:22,079
did some other things we removed some

1535
00:50:25,990 --> 00:50:23,520
hardware to reduce weight so we could

1536
00:50:27,510 --> 00:50:26,000
carry more useful payloads up to space

1537
00:50:30,470 --> 00:50:27,520
we also made it a little easier for the

1538
00:50:32,710 --> 00:50:30,480

crew to work inside the module and then

1539
00:50:33,910 --> 00:50:32,720
we also left another special thing or

1540
00:50:35,109 --> 00:50:33,920
two that i can't tell you about inside

1541
00:50:36,230 --> 00:50:35,119
the module

1542
00:50:37,510 --> 00:50:36,240
one thing i can tell you about we have a

1543
00:50:39,030 --> 00:50:37,520
banner that's flying in the module that

1544
00:50:40,390 --> 00:50:39,040
we've all signed and the idea is we're

1545
00:50:42,549 --> 00:50:40,400
going to get it out and bring it home

1546
00:50:44,150 --> 00:50:42,559
and put it on display in torino at the

1547
00:50:45,670 --> 00:50:44,160
plant where the where the module was

1548
00:50:47,030 --> 00:50:45,680
built so that's a little piece of us

1549
00:50:47,829 --> 00:50:47,040
that's going on the flight that's coming

1550
00:50:48,950 --> 00:50:47,839
home

1551
00:50:50,309 --> 00:50:48,960
and

1552
00:50:51,750 --> 00:50:50,319
i think was there a third part to that

1553
00:50:53,829 --> 00:50:51,760
question okay that was it all right

1554
00:50:55,510 --> 00:50:53,839
thanks

1555
00:50:58,309 --> 00:50:55,520
mike as currently scheduled should

1556
00:51:00,150 --> 00:50:58,319
endeavor be on the pad when uh discovery

1557
00:51:00,950 --> 00:51:00,160
touches down and

1558
00:51:05,829 --> 00:51:00,960
no

1559
00:51:07,990 --> 00:51:05,839
to the vab next monday the 28th and then

1560
00:51:09,829 --> 00:51:08,000
out to the launch pad on the ninth so it

1561
00:51:13,109 --> 00:51:09,839
all goes according to plan discovery be

1562
00:51:17,270 --> 00:51:14,870
are there any further questions yeah

1563
00:51:19,750 --> 00:51:17,280

just a quick one i just thought about

1564
00:51:22,870 --> 00:51:19,760
um do you plan to

1565
00:51:25,670 --> 00:51:22,880
take the inner liner or the cargo bay

1566
00:51:27,670 --> 00:51:25,680
of the shuttle i mean of discovery and

1567
00:51:29,750 --> 00:51:27,680
hand out a little piece to each other

1568
00:51:31,910 --> 00:51:29,760
workers or other parts of the shuttle to

1569
00:51:34,870 --> 00:51:31,920
the ksc workers

1570
00:51:37,270 --> 00:51:34,880
there is a there's a dedicated team uh

1571
00:51:39,910 --> 00:51:37,280
looking at uh ways to commemorate the

1572
00:51:41,430 --> 00:51:39,920
program and the orbiters themselves

1573
00:51:43,190 --> 00:51:41,440
and uh i'll be honest with you i'm not

1574
00:51:45,750 --> 00:51:43,200
sure the payload bay liner is part of it

1575
00:51:47,270 --> 00:51:45,760
but but i suspect it probably is

1576
00:51:49,109 --> 00:51:47,280
uh we've done that in the past we've

1577
00:51:50,470 --> 00:51:49,119
made bookmarks out of them that type of

1578
00:51:52,710 --> 00:51:50,480
thing cut out a one inch square and

1579
00:51:54,630 --> 00:51:52,720
laminated on a bookmark

1580
00:51:56,630 --> 00:51:54,640
something like that i'm sure is being

1581
00:51:58,069 --> 00:51:56,640
planned especially for this the

1582
00:52:00,230 --> 00:51:58,079
discovery team

1583
00:52:01,829 --> 00:52:00,240
again a whole dedicated team looking at

1584
00:52:04,950 --> 00:52:01,839
at the morale of the workforce and what

1585
00:52:07,829 --> 00:52:04,960
can we do to to uh to um

1586
00:52:10,150 --> 00:52:07,839
you know commemorate the program and and

1587
00:52:11,270 --> 00:52:10,160
have something physical that we can hand

1588
00:52:13,270 --> 00:52:11,280

out

1589
00:52:15,829 --> 00:52:13,280
that we can show our families

1590
00:52:18,309 --> 00:52:15,839
uh and be able to describe how proud we

1591
00:52:20,069 --> 00:52:18,319
are of having worked in this program so

1592
00:52:21,589 --> 00:52:20,079
there yeah there's something going on

1593
00:52:23,990 --> 00:52:21,599
there i'm not quite sure about the liner

1594
00:52:28,150 --> 00:52:25,349
okay that's all the time we have for

1595
00:52:30,230 --> 00:52:28,160
today's sts-133 pre-launch news

1596
00:52:32,950 --> 00:52:30,240
conference a couple of notes today there

1597
00:52:34,790 --> 00:52:32,960
will be a demonstration of modification

1598
00:52:37,589 --> 00:52:34,800
work done to discovery's external fuel

1599
00:52:40,069 --> 00:52:37,599
tank in the nasa news center at 1 30 pm

1600
00:52:45,990 --> 00:52:40,079
eastern time that will be shown on

1601
00:52:49,670 --> 00:52:47,030
channel

1602
00:52:51,109 --> 00:52:49,680
slash nasa kennedy again the rotating

1603
00:52:53,589 --> 00:52:51,119
service structure will be moved away

1604
00:52:55,829 --> 00:52:53,599
from discovery tonight at 8 pm eastern

1605
00:52:58,390 --> 00:52:55,839
time and nasa tv coverage for launch

1606
00:53:02,390 --> 00:52:58,400
activities will begin live tomorrow

1607
00:53:04,549 --> 00:53:02,400
morning at 7 15 a.m eastern