
NASA

1
00:00:07,700 --> 00:00:04,900
good afternoon and welcome to our

2
00:00:09,770 --> 00:00:07,710
sts-135 Flight Readiness review news

3
00:00:11,600 --> 00:00:09,780
conference which followed today's

4
00:00:14,030 --> 00:00:11,610
meeting here at Kennedy Space Center to

5
00:00:17,300 --> 00:00:14,040
determine the launch date for sts-135

6
00:00:18,890 --> 00:00:17,310
and with us today on our panel at NASA's

7
00:00:21,010 --> 00:00:18,900
associate administrator for Space

8
00:00:24,080 --> 00:00:21,020
Operations mr. bill Gerstenmaier

9
00:00:26,509 --> 00:00:24,090
afternoon space shuttle program launch

10
00:00:28,759 --> 00:00:26,519
integration manager Mike Moses Jeffery

11
00:00:31,160 --> 00:00:28,769
and shuttle launch director Mike

12
00:00:33,260 --> 00:00:31,170
Leinbach afternoon everybody we'll begin

13
00:00:34,729 --> 00:00:33,270

with comments and then we'll be happy to

14
00:00:38,810 --> 00:00:34,739
take your questions mr. Gerstenmaier

15
00:00:41,240 --> 00:00:38,820
thanks Mike we set july eight the for

16
00:00:43,940 --> 00:00:41,250
the launch that I think the in-plane

17
00:00:46,700 --> 00:00:43,950
time is eleven twenty six a.m. we had a

18
00:00:49,880 --> 00:00:46,710
very thorough review like our previous

19
00:00:52,729 --> 00:00:49,890
FR RS we spent quite a bit of time going

20
00:00:54,110 --> 00:00:52,739
over each activity that is going to

21
00:00:55,610 --> 00:00:54,120
occur on this flight there's some unique

22
00:00:57,020 --> 00:00:55,620
things that are associated with this

23
00:00:59,119 --> 00:00:57,030
flight the fact we have four crew

24
00:01:00,979 --> 00:00:59,129
members cuts down a little bit on some

25
00:01:02,450 --> 00:01:00,989
of the crew time to get things done so

26
00:01:04,039 --> 00:01:02,460
we had to make some adjustments to make

27
00:01:06,679 --> 00:01:04,049
sure that that would all fit and that

28
00:01:10,039 --> 00:01:06,689
all worked out well we also have the

29
00:01:11,990 --> 00:01:10,049
unique contingency crew support plan in

30
00:01:13,670 --> 00:01:12,000
case we have orbiter damage we're going

31
00:01:16,190 --> 00:01:13,680
to use the Soyuz spacecraft which we

32
00:01:18,050 --> 00:01:16,200
talked about before we reviewed that in

33
00:01:20,060 --> 00:01:18,060
a lot of detail we went over exactly

34
00:01:22,850 --> 00:01:20,070
what equipment is pre-positioned where

35
00:01:25,969 --> 00:01:22,860
what our options are if we go into that

36
00:01:28,190 --> 00:01:25,979
activity and kind of the bottom outcome

37
00:01:29,630 --> 00:01:28,200
of that whole discussion was that even

38
00:01:32,510 --> 00:01:29,640

though we're using a different means to

39
00:01:34,039 --> 00:01:32,520
provide crew rescue capability it's as

40
00:01:35,569 --> 00:01:34,049
least as good as what we had with the

41
00:01:37,069 --> 00:01:35,579
shuttle in some ways it's actually

42
00:01:38,719 --> 00:01:37,079
better than what we had with the shuttle

43
00:01:41,090 --> 00:01:38,729
and the fact we would have some medical

44
00:01:43,190 --> 00:01:41,100
capability to return crew members on a

45
00:01:44,899 --> 00:01:43,200
Soyuz if we needed to sometime during

46
00:01:46,730 --> 00:01:44,909
that period so there's there's some

47
00:01:48,499 --> 00:01:46,740
unique advantages of this alternate

48
00:01:51,230 --> 00:01:48,509
scenario that it's not just a one for

49
00:01:52,819 --> 00:01:51,240
one difference there's actually a good

50
00:01:55,219 --> 00:01:52,829
trade between the two we spent quite a

51
00:01:58,459 --> 00:01:55,229
bit talking time talking about that we

52
00:02:01,910 --> 00:01:58,469
also reviewed the previous anomalies we

53
00:02:05,359 --> 00:02:01,920
saw on the vehicles that flew before we

54
00:02:08,510 --> 00:02:05,369
talked about the tire fire that we saw

55
00:02:10,369 --> 00:02:08,520
in the runway a post landing again we

56
00:02:12,140 --> 00:02:10,379
think that's almost a nominal kind of

57
00:02:14,149 --> 00:02:12,150
occurrence the small amount of

58
00:02:15,470 --> 00:02:14,159
brake fluid or hydraulic fluid that

59
00:02:17,210 --> 00:02:15,480
could be there that would flash would

60
00:02:19,610 --> 00:02:17,220
leave no suit didn't rip any temp

61
00:02:21,319 --> 00:02:19,620
sensors there's some very small wires in

62
00:02:23,240 --> 00:02:21,329
that area so there was no really heat

63
00:02:24,710 --> 00:02:23,250

associated with that it could be an

64
00:02:26,539 --> 00:02:24,720
occurrence that actually occurs during

65
00:02:28,309 --> 00:02:26,549
daylight landings if there's a small

66
00:02:30,710 --> 00:02:28,319
amount of fluid there that would would

67
00:02:32,569 --> 00:02:30,720
burn off or flash off and we would not

68
00:02:35,300 --> 00:02:32,579
see it during a daylight landing but we

69
00:02:38,479 --> 00:02:35,310
reviewed that in extensive details we

70
00:02:40,550 --> 00:02:38,489
went over really a very thorough review

71
00:02:42,979 --> 00:02:40,560
I was continually impressed by the teams

72
00:02:44,960 --> 00:02:42,989
how much they continued to dig into each

73
00:02:46,670 --> 00:02:44,970
and every problem we talked about the

74
00:02:48,410 --> 00:02:46,680
main engine valve that leaked during the

75
00:02:50,990 --> 00:02:48,420
tanking test we spent quite a bit of

76
00:02:53,420 --> 00:02:51,000
time going over that they've dismantled

77
00:02:55,610 --> 00:02:53,430
the valve about California they found a

78
00:02:57,530 --> 00:02:55,620
small particle in the valve on the valve

79
00:02:59,149 --> 00:02:57,540
seat that could be a contributor to what

80
00:03:00,979 --> 00:02:59,159
we saw on the pad so that's an

81
00:03:02,420 --> 00:03:00,989
encouraging thing that by changing that

82
00:03:04,970 --> 00:03:02,430
component out we've got a good

83
00:03:06,800 --> 00:03:04,980
configuration out on the launch pad I

84
00:03:09,020 --> 00:03:06,810
was also tremendously impressed by the

85
00:03:12,020 --> 00:03:09,030
team and the ability for them to keep

86
00:03:13,520 --> 00:03:12,030
working issues that come up the fuel

87
00:03:15,110 --> 00:03:13,530
valve change out was new work for the

88
00:03:16,970 --> 00:03:15,120

teams down here at Kennedy they did a

89
00:03:20,479 --> 00:03:16,980
great job of working that into the flow

90
00:03:21,920 --> 00:03:20,489
and getting that activity done so again

91
00:03:23,569 --> 00:03:21,930
I think overall it was a very thorough

92
00:03:25,490 --> 00:03:23,579
review it wasn't much different than our

93
00:03:27,170 --> 00:03:25,500
other flight ratings reviews as I've

94
00:03:30,289 --> 00:03:27,180
told you before I kind of you know

95
00:03:31,879 --> 00:03:30,299
really wanted us to stay on target and

96
00:03:33,649 --> 00:03:31,889
keep thinking about the mission in front

97
00:03:35,420 --> 00:03:33,659
of us keep thinking about our the task

98
00:03:37,819 --> 00:03:35,430
that we've got to go do this flight is

99
00:03:40,069 --> 00:03:37,829
incredibly important to space station

100
00:03:43,490 --> 00:03:40,079
the cargo that is coming up on this

101
00:03:45,080 --> 00:03:43,500
flight is is really mandatory for for

102
00:03:47,119 --> 00:03:45,090
Space Station you can see that in our

103
00:03:48,890 --> 00:03:47,129
minimum duration flight duration for

104
00:03:50,599 --> 00:03:48,900
this mission it's a 10-day mission and

105
00:03:53,569 --> 00:03:50,609
that essentially allows us to get all

106
00:03:55,699 --> 00:03:53,579
the cargo off of the MPL em and return

107
00:03:57,379 --> 00:03:55,709
some cargo on the MPL em in the shuttle

108
00:03:59,689 --> 00:03:57,389
even if in the event we have a shuttle

109
00:04:01,759 --> 00:03:59,699
anomaly that wants us to return early so

110
00:04:03,559 --> 00:04:01,769
that kind of implies to you how critical

111
00:04:05,180 --> 00:04:03,569
this mission is from a resupply

112
00:04:07,430 --> 00:04:05,190
standpoint that we're willing to stay on

113
00:04:09,770 --> 00:04:07,440

orbit with some small orbiter failures

114
00:04:11,569 --> 00:04:09,780
to get these minimum critical transfer

115
00:04:13,610 --> 00:04:11,579
tasks done so the teams have done a

116
00:04:16,009 --> 00:04:13,620
great job I think they did a tremendous

117
00:04:17,689 --> 00:04:16,019
job today of staying on point talking

118
00:04:19,129 --> 00:04:17,699
about what we needed to talk about get

119
00:04:21,170 --> 00:04:19,139
ready for the mission get ready for the

120
00:04:23,089 --> 00:04:21,180
launch and make sure that we are really

121
00:04:24,649 --> 00:04:23,099
ready to go do this mission like we've

122
00:04:25,370 --> 00:04:24,659
done the missions before so there wasn't

123
00:04:27,620 --> 00:04:25,380
much

124
00:04:29,630 --> 00:04:27,630
discussion no fanfare no unique

125
00:04:31,550 --> 00:04:29,640
activities at all with the FR I tried to

126
00:04:32,900 --> 00:04:31,560
keep it as much as we could and the only

127
00:04:34,550 --> 00:04:32,910
thing at the end was a little different

128
00:04:36,950 --> 00:04:34,560
was that Mike suffered a knee gave a

129
00:04:38,480 --> 00:04:36,960
picture to John Shannon of the fly

130
00:04:40,610 --> 00:04:38,490
around of the orbiter attached to

131
00:04:44,420 --> 00:04:40,620
station so the station program has it's

132
00:04:46,700 --> 00:04:44,430
a self-portrait per se or Soyuz portrait

133
00:04:48,170 --> 00:04:46,710
I guess and I'll turn it over to Mike

134
00:04:50,750 --> 00:04:48,180
for any other comments all right thanks

135
00:04:53,180 --> 00:04:50,760
Bill let's see ya as bill mentioned a

136
00:04:54,770 --> 00:04:53,190
really thorough review today he covered

137
00:04:57,800 --> 00:04:54,780
a lot of the technical issues we also

138
00:04:59,990 --> 00:04:57,810

talked an unexplained anomaly that we

139
00:05:02,240 --> 00:05:00,000
had we saw in some of the imagery on the

140
00:05:04,220 --> 00:05:02,250
last mission right at SRB Sep one of the

141
00:05:06,200 --> 00:05:04,230
cameras we have mounted on the SRV that

142
00:05:08,420 --> 00:05:06,210
looks back at the external tank inner

143
00:05:10,490 --> 00:05:08,430
tank captured a little cylindrical

144
00:05:12,680 --> 00:05:10,500
debris piece tumbling by we've never

145
00:05:14,060 --> 00:05:12,690
seen anything like that before and so it

146
00:05:16,370 --> 00:05:14,070
really got us curious as to what that

147
00:05:18,380 --> 00:05:16,380
could be we've done an extensive

148
00:05:20,570 --> 00:05:18,390
investigation of all the returned

149
00:05:22,520 --> 00:05:20,580
hardware nothing's missing all the

150
00:05:25,340 --> 00:05:22,530
on-orbit photos we took of the external

151
00:05:26,420 --> 00:05:25,350
tank since we don't recover that and we

152
00:05:28,250 --> 00:05:26,430
didn't see anything there that looked

153
00:05:29,990 --> 00:05:28,260
like it was obvious we then went to the

154
00:05:31,550 --> 00:05:30,000
next level and just literally looked at

155
00:05:33,970 --> 00:05:31,560
all the components in that system up

156
00:05:36,710 --> 00:05:33,980
near that attach point and looked from a

157
00:05:38,060 --> 00:05:36,720
geometrical perspective what parts are

158
00:05:40,670 --> 00:05:38,070
there that looked like that and what

159
00:05:42,800 --> 00:05:40,680
could be in that area and went through

160
00:05:44,270 --> 00:05:42,810
all that exhaustive stuff at the end of

161
00:05:46,310 --> 00:05:44,280
the day we really didn't come up with

162
00:05:49,040 --> 00:05:46,320
any any candidates we found one

163
00:05:50,960 --> 00:05:49,050

component in the SRB system as it

164
00:05:52,760 --> 00:05:50,970
attaches to the external tank there's a

165
00:05:54,590 --> 00:05:52,770
grounding strap that basically connects

166
00:05:56,900 --> 00:05:54,600
the external tank side hardware over to

167
00:05:58,160 --> 00:05:56,910
the SRB side hardware and there's two

168
00:06:00,410 --> 00:05:58,170
connectors that plug into a little

169
00:06:02,270 --> 00:06:00,420
coupler and the coupler can detach on

170
00:06:03,470 --> 00:06:02,280
either end so as this if you think of it

171
00:06:05,900 --> 00:06:03,480
it's a string with the connector in the

172
00:06:07,490 --> 00:06:05,910
middle and it pulls apart one end is

173
00:06:09,230 --> 00:06:07,500
going to come off and not the other it's

174
00:06:10,280 --> 00:06:09,240
you know if you have a little connector

175
00:06:11,390 --> 00:06:10,290
in the middle and you pull it's not

176
00:06:13,730 --> 00:06:11,400
going to come off on both sides

177
00:06:16,190 --> 00:06:13,740
whichever one's got the lowest pull

178
00:06:18,200 --> 00:06:16,200
force will release we've we get this

179
00:06:19,820 --> 00:06:18,210
part back on the SRBs about half the

180
00:06:21,980 --> 00:06:19,830
time we see that the couplers on this

181
00:06:23,600 --> 00:06:21,990
SRB side the assumption is the other

182
00:06:26,150 --> 00:06:23,610
half of the time it's on the ET side but

183
00:06:27,980 --> 00:06:26,160
we really can't prove that we did a lot

184
00:06:29,840 --> 00:06:27,990
of testing and analysis and pull testing

185
00:06:32,330 --> 00:06:29,850
to show that we can't make this come off

186
00:06:34,850 --> 00:06:32,340
in both sides at the same time and make

187
00:06:37,370 --> 00:06:34,860
this uncontained debris so it's a very

188
00:06:39,070 --> 00:06:37,380

unlikely release point but it's about

189
00:06:41,090 --> 00:06:39,080
the only thing left in the system that

190
00:06:43,430 --> 00:06:41,100
geometrically looks like that that would

191
00:06:45,350 --> 00:06:43,440
be exposed at that same time frame so we

192
00:06:48,230 --> 00:06:45,360
kind of focused on that is a use that as

193
00:06:49,550 --> 00:06:48,240
our worst case our worst case look and

194
00:06:51,140 --> 00:06:49,560
we looked at it just to make sure we

195
00:06:54,500 --> 00:06:51,150
understood what would happen if it did

196
00:06:55,640 --> 00:06:54,510
come off and again the real rationale

197
00:06:57,770 --> 00:06:55,650
there is it's an extremely unlikely

198
00:06:59,510 --> 00:06:57,780
thing to happen we validated our design

199
00:07:01,490 --> 00:06:59,520
we did test the show that we cannot

200
00:07:03,470 --> 00:07:01,500
create this this piece of debris to

201
00:07:05,690 --> 00:07:03,480
liberate but even if it did we have high

202
00:07:07,160 --> 00:07:05,700
confidence in our tools are on orbit

203
00:07:08,630 --> 00:07:07,170
inspections and our imagery techniques

204
00:07:10,520 --> 00:07:08,640
to be able to detect if it did hit the

205
00:07:11,870 --> 00:07:10,530
shuttle and cause damage to the orbiter

206
00:07:13,580 --> 00:07:11,880
we would detect that and then be able to

207
00:07:15,410 --> 00:07:13,590
implement all the processes we have in

208
00:07:17,720 --> 00:07:15,420
place to address any damage that it

209
00:07:19,220 --> 00:07:17,730
might cause if it did actually release

210
00:07:21,670 --> 00:07:19,230
and then did actually transport and hit

211
00:07:24,050 --> 00:07:21,680
us but it was again like bill said and a

212
00:07:25,490 --> 00:07:24,060
testament to the investigation you know

213
00:07:27,590 --> 00:07:25,500

even here with one flight to go we went

214
00:07:29,750 --> 00:07:27,600
to the ants degree to look what possibly

215
00:07:31,850 --> 00:07:29,760
could be there we did a bunch of testing

216
00:07:33,590 --> 00:07:31,860
we did a bunch of camera testing to

217
00:07:35,150 --> 00:07:33,600
really try to verify and validate that

218
00:07:37,190 --> 00:07:35,160
we understood even though it was an

219
00:07:38,390 --> 00:07:37,200
unexplained piece of debris that we

220
00:07:40,400 --> 00:07:38,400
really did understand as much as we

221
00:07:42,560 --> 00:07:40,410
possibly could and understand the risk

222
00:07:45,230 --> 00:07:42,570
that that poses to us and deemed that it

223
00:07:46,640 --> 00:07:45,240
was not at all to a level where we

224
00:07:48,290 --> 00:07:46,650
needed to be worried about it and it was

225
00:07:49,550 --> 00:07:48,300
acceptable to go ahead and fly even

226
00:07:51,980 --> 00:07:49,560
though we don't know exactly what the

227
00:07:54,350 --> 00:07:51,990
source of that debris was on the

228
00:07:57,380 --> 00:07:54,360
external tank side we did a tanking test

229
00:07:59,240 --> 00:07:57,390
now two weeks ago the main purpose there

230
00:08:01,130 --> 00:07:59,250
was to test the modifications we made to

231
00:08:02,570 --> 00:08:01,140
the inner tank stringers you recall a

232
00:08:04,220 --> 00:08:02,580
few missions back we had cracks on those

233
00:08:06,260 --> 00:08:04,230
stringers that we had to modify this

234
00:08:08,630 --> 00:08:06,270
tank is flying inner tank stringers made

235
00:08:11,330 --> 00:08:08,640
from that same metal from the lot that

236
00:08:13,730 --> 00:08:11,340
is a little defective and so we needed

237
00:08:15,830 --> 00:08:13,740
to preemptively go reinforce the inner

238
00:08:17,300 --> 00:08:15,840

tank we did that the tanking test was

239
00:08:19,670 --> 00:08:17,310
just kind of the icing on the cake to

240
00:08:21,110 --> 00:08:19,680
verify that that we truly understood all

241
00:08:23,180 --> 00:08:21,120
our models and all our inputs that there

242
00:08:25,850 --> 00:08:23,190
were no other forces at work that would

243
00:08:27,860 --> 00:08:25,860
cause cracks we did x-rays of the the

244
00:08:30,200 --> 00:08:27,870
oxygen side flange and the hydrogen side

245
00:08:31,940 --> 00:08:30,210
flange as they face the shuttle so on

246
00:08:33,409 --> 00:08:31,950
the front side of that tank and found no

247
00:08:35,510 --> 00:08:33,419
cracks at all so that tanking test went

248
00:08:37,219 --> 00:08:35,520
off really well at the same time we were

249
00:08:39,260 --> 00:08:37,229
able to get a good check of the the foam

250
00:08:40,760 --> 00:08:39,270
on the external tank it performed

251
00:08:43,700 --> 00:08:40,770
fantastic it looks like it's in really

252
00:08:45,530 --> 00:08:43,710
great shape and as as bill said it had

253
00:08:46,820 --> 00:08:45,540
the the secondary effective in the main

254
00:08:48,620 --> 00:08:46,830
engine system as we were flowing the

255
00:08:50,390 --> 00:08:48,630
cold hydrogen through we discovered a

256
00:08:52,580 --> 00:08:50,400
leaky valve on the main engine that on

257
00:08:53,900 --> 00:08:52,590
launch day would have caused us a scrub

258
00:08:55,610 --> 00:08:53,910
had to go in and do an R&R that would

259
00:08:57,260 --> 00:08:55,620
have the latest about a week so it was

260
00:08:58,670 --> 00:08:57,270
really for tortoise to have that one

261
00:09:00,230 --> 00:08:58,680
identified ahead of time and and

262
00:09:02,630 --> 00:09:00,240
screened out it kind of a reinforcement

263
00:09:04,160 --> 00:09:02,640

of the it doesn't hurt to test what you

264
00:09:05,780 --> 00:09:04,170
fly every once in a while just to know

265
00:09:10,340 --> 00:09:05,790
what you're doing so that was a really

266
00:09:11,870 --> 00:09:10,350
good thing the the SRB guys showed us we

267
00:09:14,720 --> 00:09:11,880
had a shoot failure parachute fell on

268
00:09:17,150 --> 00:09:14,730
the one of the SRBs have one of the

269
00:09:18,920 --> 00:09:17,160
three on an SRB had a rip go through it

270
00:09:19,970 --> 00:09:18,930
again they went through to the ants

271
00:09:21,620 --> 00:09:19,980
degree to look at all the different

272
00:09:23,300 --> 00:09:21,630
things that could happen we haven't had

273
00:09:25,760 --> 00:09:23,310
very many shoots fail in the history of

274
00:09:27,200 --> 00:09:25,770
the program but the damage is there to

275
00:09:29,570 --> 00:09:27,210
show that this was probably deployment

276
00:09:32,480 --> 00:09:29,580
damage kind of a rub as it comes out of

277
00:09:35,000 --> 00:09:32,490
the out of the the canister it kind of

278
00:09:37,160 --> 00:09:35,010
probably custom heating and reefed a

279
00:09:38,570 --> 00:09:37,170
little little early a little higher rate

280
00:09:40,490 --> 00:09:38,580
it was also the first shoot on that set

281
00:09:42,410 --> 00:09:40,500
of 32 reef therefore it took the highest

282
00:09:44,240 --> 00:09:42,420
load and it just basically ripped itself

283
00:09:45,890 --> 00:09:44,250
apart the other two shoots carried the

284
00:09:47,780 --> 00:09:45,900
load just fine impact velocity was right

285
00:09:49,070 --> 00:09:47,790
about what it should be we but the

286
00:09:50,780 --> 00:09:49,080
systems designed to have a shoot failure

287
00:09:52,700 --> 00:09:50,790
without any problems at all but again

288
00:09:54,650 --> 00:09:52,710

another good testament of the the detail

289
00:09:56,060 --> 00:09:54,660
that we went into even on the last

290
00:09:57,680 --> 00:09:56,070
flight to make sure we understood the

291
00:09:58,910 --> 00:09:57,690
hardware for that that's a recovery

292
00:10:00,380 --> 00:09:58,920
thing you know it doesn't affect the

293
00:10:01,370 --> 00:10:00,390
safety of the crew at all but we didn't

294
00:10:02,810 --> 00:10:01,380
want to make sure we understood that we

295
00:10:05,390 --> 00:10:02,820
didn't have any pre-existing problems

296
00:10:06,740 --> 00:10:05,400
that might affect the next flight and

297
00:10:07,790 --> 00:10:06,750
then as bill said we've done the orbiter

298
00:10:09,920 --> 00:10:07,800
side we talked a little bit about that

299
00:10:11,600 --> 00:10:09,930
break fire just to make sure we truly

300
00:10:13,990 --> 00:10:11,610
understood its condition so again really

301
00:10:16,130 --> 00:10:14,000
good example of the detail we went into

302
00:10:17,390 --> 00:10:16,140
but to focus on the mission a second

303
00:10:18,920 --> 00:10:17,400
just to go through some of the details I

304
00:10:20,570 --> 00:10:18,930
don't think you guys have had the the

305
00:10:22,550 --> 00:10:20,580
pre-flight briefings yet from the from

306
00:10:24,140 --> 00:10:22,560
the mo d folks and so you'll hear a lot

307
00:10:26,360 --> 00:10:24,150
of this at the end of the week but

308
00:10:28,700 --> 00:10:26,370
basically it's a 12-day mission we're

309
00:10:30,890 --> 00:10:28,710
looking to try to get an extra day right

310
00:10:33,440 --> 00:10:30,900
now we it's a 12 plus zero we don't have

311
00:10:35,600 --> 00:10:33,450
the consumables to have an extra day but

312
00:10:37,460 --> 00:10:35,610
but that's bookkeeping a fair number of

313
00:10:39,230 --> 00:10:37,470

things one is to give Mike and the

314
00:10:40,310 --> 00:10:39,240
launch team some some launch attempts

315
00:10:42,710 --> 00:10:40,320
before we have to top off those

316
00:10:43,970 --> 00:10:42,720
cryotanks if we happen to go on time on

317
00:10:46,730 --> 00:10:43,980
the first attempt will carry a little

318
00:10:48,320 --> 00:10:46,740
bit of extra cry up to orbit and then

319
00:10:50,600 --> 00:10:48,330
the other thing they've looked at is the

320
00:10:52,790 --> 00:10:50,610
MPL em as it's in the cargo bay has some

321
00:10:54,380 --> 00:10:52,800
shell heaters in it basically some low

322
00:10:55,780 --> 00:10:54,390
temp eaters that turn on just to keep

323
00:10:58,250 --> 00:10:55,790
the temperatures and condensed

324
00:10:59,900 --> 00:10:58,260
condensation down they've looked at the

325
00:11:02,300 --> 00:10:59,910
specific attitude we're flying in the

326
00:11:03,830 --> 00:11:02,310
specific thermal profile and the station

327
00:11:05,190 --> 00:11:03,840
program is okay to not turn those

328
00:11:06,840 --> 00:11:05,200
heaters on before we

329
00:11:09,180 --> 00:11:06,850
doc and then also leave them off after

330
00:11:11,250 --> 00:11:09,190
we undock that power savings will be

331
00:11:13,020 --> 00:11:11,260
enough if we do go on time to

332
00:11:14,910 --> 00:11:13,030
potentially give us or get us very close

333
00:11:16,140 --> 00:11:14,920
to having the capability of adding an

334
00:11:18,450 --> 00:11:16,150
extra day we'll call that an

335
00:11:20,040 --> 00:11:18,460
energy-dependent day we'll have to wait

336
00:11:22,200 --> 00:11:20,050
and assess that we'll go ahead and get

337
00:11:23,970 --> 00:11:22,210
dr. station we'll go ahead and not power

338
00:11:25,320 --> 00:11:23,980

up those heaters and then after about

339
00:11:26,910 --> 00:11:25,330
two or three days a doctor station we'll

340
00:11:27,990 --> 00:11:26,920
see how the consumptions going and be

341
00:11:30,030 --> 00:11:28,000
able to make the decision on whether we

342
00:11:31,920 --> 00:11:30,040
have enough to stay up one more day as

343
00:11:33,540 --> 00:11:31,930
bill said it's pretty important to us in

344
00:11:34,890 --> 00:11:33,550
addition to all the cargo going up to

345
00:11:36,720 --> 00:11:34,900
station one of the things I found

346
00:11:38,910 --> 00:11:36,730
interesting today is the MPL m's packed

347
00:11:41,850 --> 00:11:38,920
about a third full of food it's taken up

348
00:11:43,710 --> 00:11:41,860
about a year supply of food the return

349
00:11:45,810 --> 00:11:43,720
cargo is also equally important to get

350
00:11:48,210 --> 00:11:45,820
off of station most of its in the some

351
00:11:50,640 --> 00:11:48,220
of its in the oru science we want back

352
00:11:51,990 --> 00:11:50,650
but a lot of it's in that just trash and

353
00:11:54,870 --> 00:11:52,000
clean up the stowage situation on

354
00:11:57,210 --> 00:11:54,880
station we're kind of doing a surge here

355
00:11:59,610 --> 00:11:57,220
and priests owing a lot of gear up on

356
00:12:01,140 --> 00:11:59,620
station to get us another year of life

357
00:12:03,710 --> 00:12:01,150
time in case we do have some problems

358
00:12:05,760 --> 00:12:03,720
with with the the commercial orbital

359
00:12:07,500 --> 00:12:05,770
resupply vehicles that are that are out

360
00:12:08,730 --> 00:12:07,510
there and they get delayed so this is

361
00:12:09,780 --> 00:12:08,740
trying to guys buy some insurance but

362
00:12:11,760 --> 00:12:09,790
what that does is put the stowage

363
00:12:13,140 --> 00:12:11,770

situation on station in a real crunch so

364
00:12:15,570 --> 00:12:13,150
the most we can offload the stuff they

365
00:12:17,400 --> 00:12:15,580
don't need with the better to fit the

366
00:12:20,040 --> 00:12:17,410
timeline the MPL Em's coming back about

367
00:12:21,450 --> 00:12:20,050
75 to 80 percent full if we could get

368
00:12:22,950 --> 00:12:21,460
that extra day on orbit we'd be able to

369
00:12:25,170 --> 00:12:22,960
get it packed one hundred percent full

370
00:12:26,520 --> 00:12:25,180
and be able to get the last little bit

371
00:12:28,590 --> 00:12:26,530
of stuff off station so it's a really

372
00:12:30,870 --> 00:12:28,600
important goal for us we're not going to

373
00:12:32,340 --> 00:12:30,880
do anything heroic to get it but it is

374
00:12:33,900 --> 00:12:32,350
something we're going to strive to try

375
00:12:37,080 --> 00:12:33,910
to gain that extra day if we can and

376
00:12:38,490 --> 00:12:37,090
turn this into a 13-day mission just to

377
00:12:40,470 --> 00:12:38,500
step through the timeline flight day

378
00:12:42,330 --> 00:12:40,480
three is the regular rendezvous and dock

379
00:12:44,580 --> 00:12:42,340
on flight day for we'll go put the MPL

380
00:12:46,980 --> 00:12:44,590
em on station flight day five will be

381
00:12:49,020 --> 00:12:46,990
the only e VA for this mission and it's

382
00:12:50,700 --> 00:12:49,030
going to be it'll be done out of the ISS

383
00:12:52,410 --> 00:12:50,710
airlock just like all the EV aces we've

384
00:12:54,060 --> 00:12:52,420
done lately but it'll be the station

385
00:12:55,770 --> 00:12:54,070
crew doing that Eve a not the shuttle

386
00:12:56,760 --> 00:12:55,780
crew with the four-person shuttle crew

387
00:12:58,500 --> 00:12:56,770
we wanted to keep their training

388
00:13:00,000 --> 00:12:58,510

requirements to a minimum and not have

389
00:13:01,740 --> 00:13:00,010
them have to have any specific UVA

390
00:13:04,790 --> 00:13:01,750
training so the station team will be

391
00:13:06,660 --> 00:13:04,800
going out their main tasks are basically

392
00:13:08,730 --> 00:13:06,670
in the back of the payload Bay in

393
00:13:11,430 --> 00:13:08,740
addition to the MPL em we're flying an

394
00:13:13,740 --> 00:13:11,440
lmc cargo carrier it's a just a a cross

395
00:13:16,740 --> 00:13:13,750
bay cargo carrier on the way up hill

396
00:13:18,600 --> 00:13:16,750
there is a robotics refueling module in

397
00:13:19,049 --> 00:13:18,610
our RM made by the Goddard Space Flight

398
00:13:21,149 --> 00:13:19,059
Center

399
00:13:24,599 --> 00:13:21,159
that's basically a testbed for robotics

400
00:13:27,109 --> 00:13:24,609
refueling demos it's kind of a very

401
00:13:30,689 --> 00:13:27,119
fancy tinker toy Lego system for the

402
00:13:32,879 --> 00:13:30,699
spdm to go up on orbit and and try and

403
00:13:35,579 --> 00:13:32,889
practice techniques of how you do remote

404
00:13:37,499 --> 00:13:35,589
refueling of satellites that's going to

405
00:13:39,359 --> 00:13:37,509
be left on station and then we're flying

406
00:13:41,219 --> 00:13:39,369
up an empty carrier to bring back down

407
00:13:42,959 --> 00:13:41,229
with us the failed pump module if you

408
00:13:45,269 --> 00:13:42,969
remember oh it's now probably going on a

409
00:13:47,789 --> 00:13:45,279
year we've had one of our external

410
00:13:49,559 --> 00:13:47,799
thermal cooling loop system pump modules

411
00:13:51,059 --> 00:13:49,569
failed we do want to bring that one back

412
00:13:52,889 --> 00:13:51,069
for failure analysis so its up on

413
00:13:55,049 --> 00:13:52,899

station right now waiting to bring back

414
00:13:56,309 --> 00:13:55,059
down so the tasks of the EBA are to

415
00:13:58,019 --> 00:13:56,319
basically bring the failed pump module

416
00:13:59,879 --> 00:13:58,029
back into the payload bay take this

417
00:14:01,949 --> 00:13:59,889
refueling module over to station stow it

418
00:14:03,539 --> 00:14:01,959
on station and then a couple other get

419
00:14:06,599 --> 00:14:03,549
ahead tasks out on the the exterior

420
00:14:08,579 --> 00:14:06,609
station so that's evie a day the MPN

421
00:14:09,929 --> 00:14:08,589
would stay out until flight day 10 when

422
00:14:11,519 --> 00:14:09,939
it gets put back in the shuttle payload

423
00:14:13,079 --> 00:14:11,529
Bay and then the next day would be

424
00:14:14,489 --> 00:14:13,089
undocking and it looks like a normal

425
00:14:16,919 --> 00:14:14,499
timeline after that even though it's a

426
00:14:18,689 --> 00:14:16,929
four-person crew we done doc do a fly

427
00:14:20,879 --> 00:14:18,699
around and then do our late inspection

428
00:14:22,709 --> 00:14:20,889
one other thing we're going to do in

429
00:14:24,179 --> 00:14:22,719
addition you saw last time we wanted to

430
00:14:26,399 --> 00:14:24,189
get the Soyuz fly around to get some of

431
00:14:28,109 --> 00:14:26,409
that engineering view and just the

432
00:14:30,119 --> 00:14:28,119
aesthetic views of a shuttle dock to

433
00:14:31,679 --> 00:14:30,129
station this time we normally do a fly

434
00:14:33,569 --> 00:14:31,689
around the shuttle comes out backs off

435
00:14:36,479 --> 00:14:33,579
and then does a fly around what we call

436
00:14:37,979 --> 00:14:36,489
the x axis of the station which is the

437
00:14:39,749 --> 00:14:37,989
views you've seen all along that kind of

438
00:14:41,729 --> 00:14:39,759

the station solar arrays make it look

439
00:14:42,809 --> 00:14:41,739
like a TIE fighter up in orbit this time

440
00:14:44,399 --> 00:14:42,819
we're going to back out the arm bar the

441
00:14:46,949 --> 00:14:44,409
station is going to turn 90 degrees and

442
00:14:48,089 --> 00:14:46,959
point its long axis at it so the trust

443
00:14:49,529 --> 00:14:48,099
with the solar arrays on it are going to

444
00:14:51,419 --> 00:14:49,539
be pointed at the station or the shuttle

445
00:14:53,219 --> 00:14:51,429
and then we'll fly around that long axis

446
00:14:54,779 --> 00:14:53,229
and so we'll get a different angle on

447
00:14:57,119 --> 00:14:54,789
some of the hardware some of those

448
00:14:58,769 --> 00:14:57,129
pieces of station don't get quite the

449
00:15:00,479 --> 00:14:58,779
photographic coverage that they would on

450
00:15:02,249 --> 00:15:00,489
a normal shuttle fly around so we're

451
00:15:03,629 --> 00:15:02,259
going to do this one to try to gain some

452
00:15:05,399 --> 00:15:03,639
last-minute views before we lose that

453
00:15:07,019 --> 00:15:05,409
capability of having those high

454
00:15:09,689 --> 00:15:07,029
resolution pictures taken by the shuttle

455
00:15:11,249 --> 00:15:09,699
crew to save time because we have to

456
00:15:12,449 --> 00:15:11,259
wait while the station maneuvers 90

457
00:15:13,679 --> 00:15:12,459
degrees we're only going to do a half of

458
00:15:15,509 --> 00:15:13,689
a lap flyer I'm not going to go the

459
00:15:17,039 --> 00:15:15,519
whole way around so a half a lap on a

460
00:15:19,169 --> 00:15:17,049
different axis should provide us some

461
00:15:21,179 --> 00:15:19,179
pretty unique views of the station for

462
00:15:23,339 --> 00:15:21,189
an engineering evaluation of how that

463
00:15:26,249 --> 00:15:23,349

system is doing after so many years up

464
00:15:28,019 --> 00:15:26,259
in orbit and then flight day 13 his

465
00:15:29,849 --> 00:15:28,029
entry setting us up for a landing on

466
00:15:31,199 --> 00:15:29,859
July twentieth I think the time is

467
00:15:32,249 --> 00:15:31,209
tweaking a little bit but it's around

468
00:15:34,979 --> 00:15:32,259
seven a.m. local

469
00:15:36,659 --> 00:15:34,989
I'm it was 630 for a while but that's

470
00:15:37,829 --> 00:15:36,669
going to be there's some reboost going

471
00:15:39,299 --> 00:15:37,839
on the station so that time is going to

472
00:15:41,669 --> 00:15:39,309
move just a little bit but it's in the

473
00:15:43,829 --> 00:15:41,679
ballpark of 7am on July twentieth which

474
00:15:46,679 --> 00:15:43,839
is pretty historical data to be landing

475
00:15:49,019 --> 00:15:46,689
anyway so so that's the mission in a

476
00:15:51,479 --> 00:15:49,029
nutshell it seems simple on paper it's

477
00:15:52,650 --> 00:15:51,489
just an MP am but like bill said the

478
00:15:54,569 --> 00:15:52,660
stuff inside that MP limb is

479
00:15:56,579 --> 00:15:54,579
unbelievably critical to the future of

480
00:15:57,749 --> 00:15:56,589
space station and so it's going to take

481
00:16:00,090 --> 00:15:57,759
a lot of effort to get it all out and

482
00:16:02,069 --> 00:16:00,100
repacked in and in the right config so

483
00:16:03,090 --> 00:16:02,079
really looking forward to achieve in

484
00:16:04,710 --> 00:16:03,100
this mission putting station where it

485
00:16:07,309 --> 00:16:04,720
needs to be and finishing strong with

486
00:16:10,259 --> 00:16:07,319
the shuttle program here with sts-135

487
00:16:12,239 --> 00:16:10,269
okay thanks Mike well say Atlantis is in

488
00:16:14,400 --> 00:16:12,249

great shape out the pad the remaining

489
00:16:16,169 --> 00:16:14,410
pad flow is very very standard for us we

490
00:16:18,059 --> 00:16:16,179
got our ordnance connected up last night

491
00:16:19,949 --> 00:16:18,069
will close the payload bay doors for

492
00:16:21,419 --> 00:16:19,959
flight tomorrow afternoon tomorrow

493
00:16:23,849 --> 00:16:21,429
evening and thursday morning will

494
00:16:26,129 --> 00:16:23,859
pressurize the high-pressure gas bottles

495
00:16:28,529 --> 00:16:26,139
on the orbiter those are the NPS and

496
00:16:31,409 --> 00:16:28,539
hyper bottles that pressurize those

497
00:16:33,029 --> 00:16:31,419
systems it will close out the afte by

498
00:16:34,590 --> 00:16:33,039
friday and we'll be able to take all

499
00:16:36,389 --> 00:16:34,600
three days of the holiday weekend off

500
00:16:38,069 --> 00:16:36,399
come back to pick up launch countdown on

501
00:16:39,809 --> 00:16:38,079
tuesday the fifth and it's going to be

502
00:16:41,549 --> 00:16:39,819
very very easy pad flow force the

503
00:16:43,499 --> 00:16:41,559
remainder the way not expecting anything

504
00:16:46,049 --> 00:16:43,509
to crop up that would cause us to work

505
00:16:48,059 --> 00:16:46,059
this weekend the launch countdown itself

506
00:16:49,650 --> 00:16:48,069
is really one of the most standard ones

507
00:16:52,889 --> 00:16:49,660
we've had in quite some time we haven't

508
00:16:55,529 --> 00:16:52,899
we do not have a PSD offload this time

509
00:16:57,659 --> 00:16:55,539
it's a non spits vehicle and so we will

510
00:17:00,329 --> 00:16:57,669
not be offloading any of the locks in

511
00:17:02,249 --> 00:17:00,339
the fuel cell system and the rest of the

512
00:17:05,100 --> 00:17:02,259
countdown is very standard will go for

513
00:17:07,619 --> 00:17:05,110

opening of the launch window 1121 local

514
00:17:08,909 --> 00:17:07,629
time on the eighth preferred time 11 26

515
00:17:11,669 --> 00:17:08,919
and that's probably what we will shoot

516
00:17:14,429 --> 00:17:11,679
for from a scrub turnaround perspective

517
00:17:16,980 --> 00:17:14,439
there is a delta on the range on the on

518
00:17:18,750 --> 00:17:16,990
the fourteenth and that would cause us

519
00:17:20,759 --> 00:17:18,760
to stand down after our launch attempt

520
00:17:22,740 --> 00:17:20,769
on on the 10th so we have attempts on

521
00:17:24,779 --> 00:17:22,750
the 8th 9th and 10th and then we would

522
00:17:26,340 --> 00:17:24,789
stand down for the Delta so that would

523
00:17:29,759 --> 00:17:26,350
give us two attempts in three days and

524
00:17:32,129 --> 00:17:29,769
hopefully that will be plenty 24 verses

525
00:17:34,590 --> 00:17:32,139
48 if we get into a scrub scenario on

526
00:17:36,570 --> 00:17:34,600
launch day I can all look at the reason

527
00:17:38,360 --> 00:17:36,580
for the scrub and the time of the scrub

528
00:17:40,590 --> 00:17:38,370
itself relative to the visitors in town

529
00:17:42,210 --> 00:17:40,600
again we're expecting somewhere between

530
00:17:43,350 --> 00:17:42,220
a half a million and three quarters of a

531
00:17:44,370 --> 00:17:43,360
million visitors and the local

532
00:17:46,080 --> 00:17:44,380
communities

533
00:17:48,270 --> 00:17:46,090
that would it would cause the launch

534
00:17:49,980 --> 00:17:48,280
team and all other processing elements a

535
00:17:51,660 --> 00:17:49,990
delay in getting home and being able to

536
00:17:53,370 --> 00:17:51,670
come back for a 24-hour scrub turn

537
00:17:55,230 --> 00:17:53,380
around if we scrub late in the launch

538
00:17:56,520 --> 00:17:55,240

window so we have that plan in place

539
00:17:58,890 --> 00:17:56,530
from a few flights ago and will

540
00:18:00,930 --> 00:17:58,900
implement that if we need to so team

541
00:18:03,000 --> 00:18:00,940
Atlantis is feeling good about the about

542
00:18:04,680 --> 00:18:03,010
the flow and the launch countdown and

543
00:18:06,360 --> 00:18:04,690
hopefully we'll be able to to get her

544
00:18:09,540 --> 00:18:06,370
off the ground on on pride of the eight

545
00:18:11,880 --> 00:18:09,550
on the schedule Mike okay thank you Mike

546
00:18:13,380 --> 00:18:11,890
we'll begin with questions here at

547
00:18:15,060 --> 00:18:13,390
Kennedy Space Center and then we'll go

548
00:18:17,100 --> 00:18:15,070
over to Johnson Space Center in Houston

549
00:18:20,070 --> 00:18:17,110
and then take a question from the phone

550
00:18:22,770 --> 00:18:20,080
line and then return to Kennedy to

551
00:18:24,390 --> 00:18:22,780
follow up and wrap things up please wait

552
00:18:25,770 --> 00:18:24,400
for the microphone state your name and

553
00:18:27,630 --> 00:18:25,780
affiliation and to whom you're

554
00:18:29,700 --> 00:18:27,640
addressing your question and we'll start

555
00:18:31,710 --> 00:18:29,710
with Marcia Marcia Dunn Associated Press

556
00:18:33,570 --> 00:18:31,720
for bill um you mentioned the Soyuz

557
00:18:37,940 --> 00:18:33,580
rotation and how that you know would

558
00:18:41,130 --> 00:18:37,950
play in is one in 560 still the best

559
00:18:48,570 --> 00:18:41,140
risk estimate for that possibly

560
00:18:50,610 --> 00:18:48,580
happening why I don't know that's the

561
00:18:54,240 --> 00:18:50,620
number that the commander had been using

562
00:18:57,180 --> 00:18:54,250
for them yeah I know I don't know what

563
00:18:58,470 --> 00:18:57,190

that would be based on it I don't I

564
00:19:00,150 --> 00:18:58,480
don't know we'd have to go we'll have to

565
00:19:03,330 --> 00:19:00,160
go look at that and get back with you

566
00:19:05,370 --> 00:19:03,340
I'd that doesn't ring a bell to me

567
00:19:06,870 --> 00:19:05,380
because rmmod slightly different other

568
00:19:08,640 --> 00:19:06,880
things are different so I don't know

569
00:19:09,660 --> 00:19:08,650
where that comes from but we'll do a

570
00:19:11,070 --> 00:19:09,670
little homework and figure out where

571
00:19:12,330 --> 00:19:11,080
that number comes from and see if it's

572
00:19:13,770 --> 00:19:12,340
the right number it probably is if the

573
00:19:17,070 --> 00:19:13,780
commander said I'm just not familiar

574
00:19:19,530 --> 00:19:17,080
with it fine and it would be for four

575
00:19:21,630 --> 00:19:19,540
separate Soyuz coming up for each of the

576
00:19:23,580 --> 00:19:21,640
four or wood to them be piggybacking on

577
00:19:24,870 --> 00:19:23,590
one potentially could you just review

578
00:19:26,250 --> 00:19:24,880
how that would work because I've heard

579
00:19:28,650 --> 00:19:26,260
different scenarios for that as well

580
00:19:30,900 --> 00:19:28,660
yeah I think we would we would again

581
00:19:32,490 --> 00:19:30,910
kind of play it by ear and see which way

582
00:19:34,620 --> 00:19:32,500
we go we could actually put two on a

583
00:19:36,570 --> 00:19:34,630
couple Soyuz we have one seat liner in

584
00:19:38,370 --> 00:19:36,580
the npl em that's going up on shuttle

585
00:19:40,410 --> 00:19:38,380
that could be used right away with one

586
00:19:42,510 --> 00:19:40,420
of the slaves so that makes sense the

587
00:19:44,250 --> 00:19:42,520
way we laid it out at least for planning

588
00:19:45,660 --> 00:19:44,260

purposes we left all the sources on

589
00:19:47,790 --> 00:19:45,670
their original launch dates where they

590
00:19:49,950 --> 00:19:47,800
are right now in the manifest it turns

591
00:19:51,510 --> 00:19:49,960
out there seven resupply options during

592
00:19:53,670 --> 00:19:51,520
that period there's seven progress

593
00:19:55,020 --> 00:19:53,680
vehicles that will be flying during that

594
00:19:57,690 --> 00:19:55,030
period so there's lots of options to

595
00:19:59,430 --> 00:19:57,700
carry up unique supplies and gear

596
00:20:01,139 --> 00:19:59,440
what I think where we do it is we looked

597
00:20:03,690 --> 00:20:01,149
at it kind of from a worst case which is

598
00:20:05,730 --> 00:20:03,700
leave everything where it is and perturb

599
00:20:07,919 --> 00:20:05,740
the manifest the absolute minimum that

600
00:20:09,960 --> 00:20:07,929
we we could and that's totally

601
00:20:11,970 --> 00:20:09,970
acceptable to us but then we would see

602
00:20:13,529 --> 00:20:11,980
how the situation panned out we'd see

603
00:20:15,899 --> 00:20:13,539
where we are with consumables we'd see

604
00:20:17,669 --> 00:20:15,909
how where we are with crew health how

605
00:20:19,379 --> 00:20:17,679
things are moving and then we can adapt

606
00:20:21,990 --> 00:20:19,389
and change around so it's a very

607
00:20:23,490 --> 00:20:22,000
flexible plan and really what we did is

608
00:20:25,230 --> 00:20:23,500
we laid out to make sure that there was

609
00:20:27,180 --> 00:20:25,240
a credible path through this plan that

610
00:20:29,220 --> 00:20:27,190
could lead to success and could get our

611
00:20:32,460 --> 00:20:29,230
crews home in the remote possibility

612
00:20:34,440 --> 00:20:32,470
that we had to go do this just to get

613
00:20:36,690 --> 00:20:34,450

rid of an orbiter on orbit and again I

614
00:20:38,759 --> 00:20:36,700
think I stress to everyone even in the

615
00:20:40,980 --> 00:20:38,769
review is that we don't really think

616
00:20:42,750 --> 00:20:40,990
this is a likely case this is kind of

617
00:20:44,549 --> 00:20:42,760
due diligence on our part to make sure

618
00:20:46,950 --> 00:20:44,559
we are prepared that we have laid out a

619
00:20:49,649 --> 00:20:46,960
logical plan that we can use and

620
00:20:51,210 --> 00:20:49,659
implement if this this problem occurs

621
00:20:53,190 --> 00:20:51,220
and that's the way we treat it it's got

622
00:20:55,230 --> 00:20:53,200
lots of flexibility and it in an exact

623
00:20:57,960 --> 00:20:55,240
way we would implement it will kind of

624
00:21:01,139 --> 00:20:57,970
depend upon how exactly things break is

625
00:21:03,680 --> 00:21:01,149
as we go through the process Jay yeah

626
00:21:07,560 --> 00:21:03,690
bill I have a real long question here

627
00:21:10,169 --> 00:21:07,570
when Atlantis goes up that's the last

628
00:21:14,519 --> 00:21:10,179
vehicle you have or even in your plans

629
00:21:16,200 --> 00:21:14,529
that can do an externally VA repair no

630
00:21:19,139 --> 00:21:16,210
air locks the way I understand it are

631
00:21:22,680 --> 00:21:19,149
planned on any future vehicles now with

632
00:21:24,840 --> 00:21:22,690
that out when he first started launching

633
00:21:28,620 --> 00:21:24,850
the Space Station NASA made the promise

634
00:21:31,769 --> 00:21:28,630
to this planet that it would bring back

635
00:21:34,320 --> 00:21:31,779
a controlled space station and put it in

636
00:21:37,710 --> 00:21:34,330
the Pacific Ocean because of the

637
00:21:39,330 --> 00:21:37,720
problems that we had with Skylab Skylab

638
00:21:41,639 --> 00:21:39,340

they thought was going to hit as you

639
00:21:45,600 --> 00:21:41,649
remember the Pacific Ocean wound up

640
00:21:47,789 --> 00:21:45,610
hitting the Outlands of Australia with

641
00:21:50,700 --> 00:21:47,799
the station three times larger than

642
00:21:53,519 --> 00:21:50,710
Skylab you would lay a footprint across

643
00:21:56,370 --> 00:21:53,529
the whole United States almost with

644
00:21:58,830 --> 00:21:56,380
lethal debris if you had an uncontrolled

645
00:22:01,200 --> 00:21:58,840
space station come back that you could

646
00:22:04,590 --> 00:22:01,210
not repair in orbit but let's suppose

647
00:22:06,899 --> 00:22:04,600
that we get through all the potential

648
00:22:09,480 --> 00:22:06,909
hazards we never have to abandon the

649
00:22:10,250 --> 00:22:09,490
space station and 2020 rolls around and

650
00:22:13,640 --> 00:22:10,260
you've got of

651
00:22:16,520 --> 00:22:13,650
you've got to come up with a plan so a

652
00:22:18,620 --> 00:22:16,530
way I'm told you have three choices you

653
00:22:21,470 --> 00:22:18,630
can continue the space station build a

654
00:22:25,310 --> 00:22:21,480
space city on it continued perpetually

655
00:22:27,950 --> 00:22:25,320
in orbit or you can return it home or

656
00:22:30,830 --> 00:22:27,960
you could destroy it to smithereens in

657
00:22:35,540 --> 00:22:30,840
orbit with all of these small pieces

658
00:22:38,120 --> 00:22:35,550
coming back in but how can you without

659
00:22:40,400 --> 00:22:38,130
the shuttle okay do you have enough

660
00:22:43,370 --> 00:22:40,410
propulsion on board with this space

661
00:22:46,670 --> 00:22:43,380
station system itself or using smaller

662
00:22:49,450 --> 00:22:46,680
rockets and all to control the space

663
00:22:53,570 --> 00:22:49,460

station and bring it back safely without

664
00:22:55,190 --> 00:22:53,580
being a threat to the population the

665
00:22:57,760 --> 00:22:55,200
answer to that is yes and what we've

666
00:23:00,170 --> 00:22:57,770
done is we're required to protect

667
00:23:02,870 --> 00:23:00,180
propellant on board to keep adequate

668
00:23:04,610 --> 00:23:02,880
attitude control for space station so in

669
00:23:06,350 --> 00:23:04,620
fact you'll see a start raising the

670
00:23:10,280 --> 00:23:06,360
altitude of station and that's because

671
00:23:12,500 --> 00:23:10,290
the solar of solar maximum is picking up

672
00:23:14,690 --> 00:23:12,510
and the drag is increasing on station so

673
00:23:16,670 --> 00:23:14,700
we have a requirement to be 180 days

674
00:23:18,260 --> 00:23:16,680
away from where we would drift down to

675
00:23:20,300 --> 00:23:18,270
it to an altitude but we would have

676
00:23:21,950 --> 00:23:20,310
problems and then we need to keep enough

677
00:23:24,560 --> 00:23:21,960
propellant on board that we can actually

678
00:23:27,800 --> 00:23:24,570
reboost ourselves higher so we can have

679
00:23:29,690 --> 00:23:27,810
360 days before we drift down to this

680
00:23:31,760 --> 00:23:29,700
altitude where it becomes tough to

681
00:23:33,380 --> 00:23:31,770
control the space station so we've got a

682
00:23:35,660 --> 00:23:33,390
basic plan that we're going to stay well

683
00:23:38,090 --> 00:23:35,670
above the altitude that we required to

684
00:23:41,150 --> 00:23:38,100
keep attitude control on space station

685
00:23:43,460 --> 00:23:41,160
we have multitude of redundancy in our

686
00:23:45,200 --> 00:23:43,470
attitude control systems we can use the

687
00:23:47,480 --> 00:23:45,210
progress vehicles to provide attitude

688
00:23:49,610 --> 00:23:47,490

control we can use the service module

689
00:23:51,740 --> 00:23:49,620
thrusters to provide add to control as

690
00:23:53,780 --> 00:23:51,750
you all know our control moment gyros

691
00:23:56,530 --> 00:23:53,790
can provide attitude control there's

692
00:23:59,480 --> 00:23:56,540
four of those we have four spares of

693
00:24:01,430 --> 00:23:59,490
control moma gyros on orbit we can

694
00:24:03,020 --> 00:24:01,440
replace those we only need two of those

695
00:24:04,700 --> 00:24:03,030
to maintain attitude control we can

696
00:24:06,710 --> 00:24:04,710
probably maintain attitude control with

697
00:24:08,450 --> 00:24:06,720
just one of those so in a whole variety

698
00:24:10,340 --> 00:24:08,460
of scenarios we are going to keep

699
00:24:12,770 --> 00:24:10,350
attitude control and if we can keep

700
00:24:15,980 --> 00:24:12,780
attitude control it's it's relatively

701
00:24:18,890 --> 00:24:15,990
easy to target to put space station into

702
00:24:20,720 --> 00:24:18,900
a deorbit path that would do it it into

703
00:24:22,040 --> 00:24:20,730
the ocean and would not put any risk at

704
00:24:23,090 --> 00:24:22,050
all on the earth as long as we can

705
00:24:25,250 --> 00:24:23,100
maintain attitude

706
00:24:27,529 --> 00:24:25,260
troll so we have adequate ability to

707
00:24:29,180 --> 00:24:27,539
keep it from a system standpoint as you

708
00:24:31,610 --> 00:24:29,190
saw last summer when their ammonia pump

709
00:24:33,740 --> 00:24:31,620
went down we have the ability to do EVs

710
00:24:35,930 --> 00:24:33,750
out of the space station which we can do

711
00:24:38,450 --> 00:24:35,940
we can repair components we have the

712
00:24:40,580 --> 00:24:38,460
spare parts on orbit to do those things

713
00:24:42,380 --> 00:24:40,590

and we'll do that before we degrade down

714
00:24:45,490 --> 00:24:42,390
to where we would lose attitude control

715
00:24:48,529 --> 00:24:45,500
we also have a limited capability to do

716
00:24:50,720 --> 00:24:48,539
EVs out of the saw use the saw use has

717
00:24:52,400 --> 00:24:50,730
an orbital compartment you can use that

718
00:24:54,650 --> 00:24:52,410
orbital compartment to do some limited

719
00:24:56,779 --> 00:24:54,660
EVs so we do have even in a remote

720
00:25:00,380 --> 00:24:56,789
remote contingency situation ability to

721
00:25:02,600 --> 00:25:00,390
do some EVs from from from the Soyuz

722
00:25:04,730 --> 00:25:02,610
then the last thing is our components

723
00:25:07,010 --> 00:25:04,740
our attitude control hardware on side

724
00:25:09,560 --> 00:25:07,020
Space Station it's designed operated a

725
00:25:11,090 --> 00:25:09,570
vacuum so if we had some evacuation

726
00:25:12,830 --> 00:25:11,100
event that took all the pressure out of

727
00:25:14,810 --> 00:25:12,840
space station the electronics components

728
00:25:16,850 --> 00:25:14,820
that keep these attitude control systems

729
00:25:19,159 --> 00:25:16,860
are there and we would use those to

730
00:25:20,810 --> 00:25:19,169
maintain attitude control so if we lose

731
00:25:23,180 --> 00:25:20,820
attitude control even if we had a

732
00:25:24,740 --> 00:25:23,190
shuttle it's really tough to get a

733
00:25:27,260 --> 00:25:24,750
shuttle up there to dock with the solar

734
00:25:29,750 --> 00:25:27,270
rays and the radiators and all that

735
00:25:32,270 --> 00:25:29,760
component to capture a tumbling station

736
00:25:34,669 --> 00:25:32,280
to come so our job whether we had a

737
00:25:36,470 --> 00:25:34,679
shuttle or not is to prevent that

738
00:25:38,510 --> 00:25:36,480

occurrence from happening and we need to

739
00:25:40,940 --> 00:25:38,520
make sure we keep attitude control and I

740
00:25:42,980 --> 00:25:40,950
believe you can't say it's it's

741
00:25:44,960 --> 00:25:42,990
impossible but there's a tremendous

742
00:25:46,430 --> 00:25:44,970
amount of robustness that keeps us from

743
00:25:48,740 --> 00:25:46,440
losing attitude control which ultimately

744
00:25:51,200 --> 00:25:48,750
provides us with the capability to do a

745
00:25:53,240 --> 00:25:51,210
safety orbit of space station so the

746
00:25:55,789 --> 00:25:53,250
bottom line is unless you have a

747
00:25:58,730 --> 00:25:55,799
derelict something that you have no

748
00:26:02,120 --> 00:25:58,740
control over people killed on board or

749
00:26:03,799 --> 00:26:02,130
abandoned that's the only threat that

750
00:26:06,409 --> 00:26:03,809
you a situation where you going to have

751
00:26:09,049 --> 00:26:06,419
a threat of this coming in uncontrolled

752
00:26:10,190 --> 00:26:09,059
and hitting the planet is that what

753
00:26:12,500 --> 00:26:10,200
you're saying it would have to be a

754
00:26:15,169 --> 00:26:12,510
pretty unique set of multiple

755
00:26:16,490 --> 00:26:15,179
circumstances that that you know if you

756
00:26:18,320 --> 00:26:16,500
if you got hit by some large piece of

757
00:26:19,909 --> 00:26:18,330
debris and portions of the station were

758
00:26:21,560 --> 00:26:19,919
evacuated we would still have attitude

759
00:26:24,380 --> 00:26:21,570
control we could still do those things

760
00:26:26,360 --> 00:26:24,390
so there's probably a case I don't know

761
00:26:28,549 --> 00:26:26,370
how to string it together but I'm sure

762
00:26:29,960 --> 00:26:28,559
if we SAT around long and if we could

763
00:26:32,210 --> 00:26:29,970

come up with a case but it's going to be

764
00:26:34,659 --> 00:26:32,220
multiple failures deep where we would be

765
00:26:39,700 --> 00:26:34,669
in this situation okay thank you so much

766
00:26:41,349 --> 00:26:39,710
Irene um thanks Irene Klotz with Reuters

767
00:26:44,470 --> 00:26:41,359
I have a couple questions for you bill

768
00:26:47,619 --> 00:26:44,480
um do you have any identification of

769
00:26:51,609 --> 00:26:47,629
that orbital debris that caused the soya

770
00:26:53,830 --> 00:26:51,619
as shelter this morning no we don't know

771
00:26:55,840 --> 00:26:53,840
what it we don't know what it's it

772
00:26:58,239 --> 00:26:55,850
doesn't have an idea just listen our

773
00:27:00,789 --> 00:26:58,249
table is unknown it's in a fairly highly

774
00:27:04,060 --> 00:27:00,799
elliptic orbit it's a inclined at about

775
00:27:06,609 --> 00:27:04,070
62 degrees inclination we did some post

776
00:27:08,470 --> 00:27:06,619
paths tracking information where we

777
00:27:10,659 --> 00:27:08,480
tracked the object after it came past

778
00:27:12,519 --> 00:27:10,669
station and then if we kind of backtrack

779
00:27:14,080 --> 00:27:12,529
to how close it came to station we think

780
00:27:15,849 --> 00:27:14,090
it came within about three hundred and

781
00:27:18,460 --> 00:27:15,859
thirty five meters of space station

782
00:27:20,619 --> 00:27:18,470
based on kind of just the best estimate

783
00:27:23,109 --> 00:27:20,629
of our trajectory back calculating so it

784
00:27:25,149 --> 00:27:23,119
was probably the closest object to space

785
00:27:26,979 --> 00:27:25,159
station that is actually come by space

786
00:27:29,320 --> 00:27:26,989
station and we didn't have any

787
00:27:31,779 --> 00:27:29,330
information that it was coming until it

788
00:27:34,450 --> 00:27:31,789

was very very close and we didn't have

789
00:27:37,119 --> 00:27:34,460
an option to do a maneuver we're working

790
00:27:39,070 --> 00:27:37,129
with our Russian partners to see if we

791
00:27:40,960 --> 00:27:39,080
can shorten a timeline to do maneuvers

792
00:27:43,269 --> 00:27:40,970
you know today it takes us a couple days

793
00:27:45,369 --> 00:27:43,279
to actually get the maneuver timeline

794
00:27:47,830 --> 00:27:45,379
loaded in station and actually try to do

795
00:27:49,330 --> 00:27:47,840
a maneuver to avoid debris we're working

796
00:27:50,830 --> 00:27:49,340
with the Russians to make some software

797
00:27:52,419 --> 00:27:50,840
changes where we can do that in a much

798
00:27:54,249 --> 00:27:52,429
more expedient manner so if we get late

799
00:27:55,960 --> 00:27:54,259
notification of an object will have the

800
00:27:57,940 --> 00:27:55,970
ability to move and so we're working on

801
00:27:58,960 --> 00:27:57,950
improving that for the future did you

802
00:28:01,330 --> 00:27:58,970
say

803
00:28:03,190 --> 00:28:01,340
we don't know the size of it and I don't

804
00:28:04,630 --> 00:28:03,200
have the mass of it I've asked folks

805
00:28:06,399 --> 00:28:04,640
right now it's just listed in the

806
00:28:09,549 --> 00:28:06,409
catalog is unknown so then that means we

807
00:28:11,080 --> 00:28:09,559
don't know exactly where it came from so

808
00:28:13,000 --> 00:28:11,090
therefore it's tough to get the mass in

809
00:28:14,710 --> 00:28:13,010
size but if we get it we'll get it to

810
00:28:17,289 --> 00:28:14,720
public affairs and they'll let you guys

811
00:28:19,620 --> 00:28:17,299
know thanks um and you touched on this

812
00:28:23,409 --> 00:28:19,630
in your comments earlier about the

813
00:28:26,289 --> 00:28:23,419

cruise soja seat liners so there's one

814
00:28:27,970 --> 00:28:26,299
that's going to be flying on 135 and the

815
00:28:29,770 --> 00:28:27,980
other three are just going to be in

816
00:28:31,210 --> 00:28:29,780
storage in case they're needed yeah

817
00:28:33,190 --> 00:28:31,220
they're in storage and they could either

818
00:28:35,500 --> 00:28:33,200
be flown up on the progress vehicle

819
00:28:37,360 --> 00:28:35,510
ahead of time in pre-positioned or they

820
00:28:38,560 --> 00:28:37,370
could be launched on the Soyuz that

821
00:28:41,830 --> 00:28:38,570
would actually return those crew members

822
00:28:43,870 --> 00:28:41,840
and we would make that decision again as

823
00:28:45,279 --> 00:28:43,880
we got into the situation on station it

824
00:28:47,529 --> 00:28:45,289
would it be more critical to fly

825
00:28:49,270 --> 00:28:47,539
supplies up on the progress or would be

826
00:28:50,440 --> 00:28:49,280
more important to get the seat liners up

827
00:28:52,539 --> 00:28:50,450
so then if they had a medical problem

828
00:28:54,490 --> 00:28:52,549
that could come home on Soyuz we would

829
00:28:55,539 --> 00:28:54,500
make that decision if the event occurred

830
00:28:58,330 --> 00:28:55,549
but we've got a couple different options

831
00:29:01,480 --> 00:28:58,340
to get them on orbit thanks and probably

832
00:29:03,340 --> 00:29:01,490
for either you or for like Moses um do

833
00:29:05,289 --> 00:29:03,350
you have any other details about the

834
00:29:07,539 --> 00:29:05,299
particle that was found in the fuel

835
00:29:10,029 --> 00:29:07,549
valve the size or what you think it

836
00:29:14,260 --> 00:29:10,039
might have been I'll see the size was I

837
00:29:16,029 --> 00:29:14,270
think it was 88 microns by 14 microns it

838
00:29:18,580 --> 00:29:16,039

was aight thousands by 14,000

839
00:29:19,840 --> 00:29:18,590
unbelievably small the picture they

840
00:29:21,490 --> 00:29:19,850
showed us was about the size of an eight

841
00:29:23,320 --> 00:29:21,500
and a half eleven sheet of paper so it

842
00:29:26,649 --> 00:29:23,330
looked very menacing but it was a

843
00:29:28,990 --> 00:29:26,659
unbelievably tiny particle and it's not

844
00:29:31,919 --> 00:29:29,000
uncommon to find debris in this fuel

845
00:29:34,600 --> 00:29:31,929
valve and d'bries is a big stretch small

846
00:29:38,409 --> 00:29:34,610
contamination the way this sits that's

847
00:29:41,200 --> 00:29:38,419
kind of the natural sump as as fluid

848
00:29:43,480 --> 00:29:41,210
would circulate through so all of this

849
00:29:45,010 --> 00:29:43,490
stuff is well below the the

850
00:29:46,930 --> 00:29:45,020
contamination cleaning criteria so this

851
00:29:48,880 --> 00:29:46,940
is stuff that's acceptable to the engine

852
00:29:51,039 --> 00:29:48,890
the filters can handle it all that it

853
00:29:53,080 --> 00:29:51,049
just happens to probably got itself on a

854
00:29:56,380 --> 00:29:53,090
sealing surface which generated the leak

855
00:29:58,149 --> 00:29:56,390
and they were they were very hesitant to

856
00:29:59,620 --> 00:29:58,159
say that that's the root cause we've

857
00:30:01,120 --> 00:29:59,630
seen this kind of stuff before that

858
00:30:03,610 --> 00:30:01,130
doesn't cause leaks we've seen this

859
00:30:06,580 --> 00:30:03,620
stuff before that does so it's it's not

860
00:30:08,500 --> 00:30:06,590
conclusive proof but it is a good a good

861
00:30:11,080 --> 00:30:08,510
idea that that's that's a likely cause

862
00:30:12,460 --> 00:30:11,090
of that leak one of the main problems

863
00:30:15,610 --> 00:30:12,470

with this valve that we've had

864
00:30:17,590 --> 00:30:15,620
in the past in the long past was there

865
00:30:19,180 --> 00:30:17,600
was a not a purge downstream and so as

866
00:30:20,799 --> 00:30:19,190
the hydrogen gets liquid hydrogen gets

867
00:30:23,860 --> 00:30:20,809
on the upstream side of this valve the

868
00:30:25,060 --> 00:30:23,870
downstream side forms nitrogen ice it's

869
00:30:27,430 --> 00:30:25,070
cold enough that the nitrogen in the air

870
00:30:28,870 --> 00:30:27,440
solidifies right out and forms on the

871
00:30:31,000 --> 00:30:28,880
valve which lifts up the sealing surface

872
00:30:32,919 --> 00:30:31,010
and then causes a small hydrogen leak a

873
00:30:34,120 --> 00:30:32,929
couple thing right that the temperatures

874
00:30:36,100 --> 00:30:34,130
are very small and hydrogen is a very

875
00:30:37,870 --> 00:30:36,110
small particle so it gets out very

876
00:30:40,570 --> 00:30:37,880
quickly you don't need a very big gap

877
00:30:42,399 --> 00:30:40,580
before it leaks and so we've long ago

878
00:30:44,020 --> 00:30:42,409
implemented this helium purge to kind of

879
00:30:46,090 --> 00:30:44,030
keep that out and that's taken care of

880
00:30:47,620 --> 00:30:46,100
the problem you can't ever tell if you

881
00:30:49,330 --> 00:30:47,630
had nitrogen ice because by the time the

882
00:30:51,159 --> 00:30:49,340
valve cools down enough or i should say

883
00:30:52,510 --> 00:30:51,169
warms up enough to be able to go out and

884
00:30:55,539 --> 00:30:52,520
take a look at it the ice is melted and

885
00:30:56,950 --> 00:30:55,549
it's gone so we weren't surprised that

886
00:30:58,960 --> 00:30:56,960
we didn't find a smoking gun we were

887
00:31:00,940 --> 00:30:58,970
kind of feeling a little good we found

888
00:31:02,560 --> 00:31:00,950

this little piece of particle but the

889
00:31:05,710 --> 00:31:02,570
bottom line is the new valve should be

890
00:31:07,330 --> 00:31:05,720
just fine and the true bottom line is if

891
00:31:09,100 --> 00:31:07,340
it happens to leak again we have all the

892
00:31:11,500 --> 00:31:09,110
right protocols and procedures in place

893
00:31:13,240 --> 00:31:11,510
to keep us in a safe configuration out

894
00:31:15,100 --> 00:31:13,250
at the launch pad it would result in

895
00:31:16,299 --> 00:31:15,110
another scrub but but that would be what

896
00:31:18,220 --> 00:31:16,309
the right thing to do that day if this

897
00:31:20,200 --> 00:31:18,230
leak does come back again but we don't

898
00:31:21,190 --> 00:31:20,210
have any any reason to suspect that we

899
00:31:25,899 --> 00:31:21,200
didn't get rid of the problem by

900
00:31:29,560 --> 00:31:25,909
changing out the valve todd halvorson of

901
00:31:34,090 --> 00:31:29,570
florida today for I guess curse maybe

902
00:31:36,010 --> 00:31:34,100
Mike Moses I've been thinking about the

903
00:31:39,760 --> 00:31:36,020
number of EPA's you guys have been doing

904
00:31:43,630 --> 00:31:39,770
annually for 10 or 11 years now and it

905
00:31:46,960 --> 00:31:43,640
probably ranges about 15 or 20 if I'm if

906
00:31:50,919 --> 00:31:46,970
I'm not mistaken and i was wondering now

907
00:31:55,060 --> 00:31:50,929
that is some way is done how many EBA is

908
00:31:57,880 --> 00:31:55,070
a year do you anticipate having to do to

909
00:32:00,279 --> 00:31:57,890
maintain the space station and I'ma

910
00:32:02,860 --> 00:32:00,289
follow I think we're looking about one

911
00:32:03,790 --> 00:32:02,870
evaa year is roughly will we predict

912
00:32:07,290 --> 00:32:03,800
them

913
00:32:09,820 --> 00:32:07,300

and again they'll be predominantly for

914
00:32:11,710 --> 00:32:09,830
for maintenance kind of activities there

915
00:32:13,330 --> 00:32:11,720
may be a little bit of payload activity

916
00:32:15,490 --> 00:32:13,340
associated with that what we'll do is

917
00:32:17,710 --> 00:32:15,500
we'll wait until enough things back up

918
00:32:19,510 --> 00:32:17,720
in that in the job jar that we're ready

919
00:32:20,620 --> 00:32:19,520
to go do an EV a you can kind of see

920
00:32:22,180 --> 00:32:20,630
what the Russians are doing with their

921
00:32:24,370 --> 00:32:22,190
EV aids are going to do an EV a this

922
00:32:26,110 --> 00:32:24,380
summer they're doing about 1 to 2 EV as

923
00:32:28,480 --> 00:32:26,120
a year so I think we'll be in about that

924
00:32:31,300 --> 00:32:28,490
same range probably one EV a or so a

925
00:32:32,530 --> 00:32:31,310
year once once we get once once it well

926
00:32:34,030 --> 00:32:32,540
once we're done we're really done with

927
00:32:36,310 --> 00:32:34,040
assembly so now we're done with assembly

928
00:32:38,650 --> 00:32:36,320
now we're in more just maintenance right

929
00:32:42,610 --> 00:32:38,660
so that would be a total of about three

930
00:32:44,890 --> 00:32:42,620
or four to us to Russian yeah probably i

931
00:32:46,960 --> 00:32:44,900
would say three probably two russian and

932
00:32:48,730 --> 00:32:46,970
one US and the other thing that you're

933
00:32:50,680 --> 00:32:48,740
going to start seeing us do into is

934
00:32:52,900 --> 00:32:50,690
grass started using dexter for more

935
00:32:56,050 --> 00:32:52,910
activities you know we had planned about

936
00:32:57,880 --> 00:32:56,060
a year ago to do a remote power control

937
00:32:59,680 --> 00:32:57,890
module change out with dexter remember

938
00:33:01,030 --> 00:32:59,690

and we tried to pull and the forces were

939
00:33:03,250 --> 00:33:01,040
larger than we thought so we had to

940
00:33:05,710 --> 00:33:03,260
reprogram dexter to use both arms

941
00:33:07,060 --> 00:33:05,720
instead of just one to pull because was

942
00:33:10,150 --> 00:33:07,070
just pulling on one there was too much

943
00:33:12,400 --> 00:33:10,160
bounce when the when the device came

944
00:33:14,770 --> 00:33:12,410
unstuck so we're going to go do that

945
00:33:16,750 --> 00:33:14,780
again probably this fall you also see us

946
00:33:18,190 --> 00:33:16,760
doing all these refueling tasks that was

947
00:33:20,380 --> 00:33:18,200
that Mike talked about a little bit

948
00:33:23,940 --> 00:33:20,390
earlier that's going to really bring out

949
00:33:26,260 --> 00:33:23,950
dexter is being able to do some pretty

950
00:33:28,450 --> 00:33:26,270
some pretty interesting tasks that

951
00:33:29,710 --> 00:33:28,460
before would have only been done with EV

952
00:33:32,440 --> 00:33:29,720
a so you're going to see you start

953
00:33:34,330 --> 00:33:32,450
moving up now on the robotic side to do

954
00:33:35,950 --> 00:33:34,340
much more robotic kind of things because

955
00:33:37,810 --> 00:33:35,960
a lot of our orbital replacement units

956
00:33:40,330 --> 00:33:37,820
are meant to be replaced with robotics

957
00:33:42,280 --> 00:33:40,340
so even back to Jay's comment there's

958
00:33:44,020 --> 00:33:42,290
some components out there on the station

959
00:33:47,020 --> 00:33:44,030
that you would have said today we're

960
00:33:48,490 --> 00:33:47,030
only EV a interchangeable or fixable I

961
00:33:49,780 --> 00:33:48,500
will tell you in the future we start

962
00:33:52,030 --> 00:33:49,790
using Dexter you're going to start

963
00:33:53,560 --> 00:33:52,040

seeing us doing a lot of robot robotic

964
00:33:55,240 --> 00:33:53,570
maintenance on the outside with Dexter

965
00:33:56,770 --> 00:33:55,250
to keep up components so that's kind of

966
00:33:58,450 --> 00:33:56,780
the next phase so we went through the EV

967
00:34:00,310 --> 00:33:58,460
a phase now we're going to push the

968
00:34:01,540 --> 00:34:00,320
robots to see how far we can get with

969
00:34:04,750 --> 00:34:01,550
maintenance with robots and that's

970
00:34:08,169 --> 00:34:04,760
coming on-station it's really

971
00:34:11,740 --> 00:34:08,179
interesting I'm thinking you guys have

972
00:34:14,360 --> 00:34:11,750
done what 159 or 100 hundred and sixty

973
00:34:16,820 --> 00:34:14,370
ebas now too

974
00:34:19,790 --> 00:34:16,830
assemble the space station and it seems

975
00:34:23,780 --> 00:34:19,800
to me that there have not been a whole

976
00:34:26,030 --> 00:34:23,790
lot of you know big deal kind of events

977
00:34:30,440 --> 00:34:26,040
or incidents that have happened if you

978
00:34:32,030 --> 00:34:30,450
look back at the assembly period what

979
00:34:35,300 --> 00:34:32,040
would you say were the the most

980
00:34:39,130 --> 00:34:35,310
significant you know events i can

981
00:34:42,710 --> 00:34:39,140
remember an ammonia leak on the destiny

982
00:34:44,630 --> 00:34:42,720
install mission and then stuff with the

983
00:34:46,040 --> 00:34:44,640
gloves i mean what would you say whereas

984
00:34:49,610 --> 00:34:46,050
the most significant things you've

985
00:34:51,500 --> 00:34:49,620
encountered well that's tough you know

986
00:34:53,540 --> 00:34:51,510
when you're sitting in Mission Control

987
00:34:55,100 --> 00:34:53,550
and you're running your flight plan any

988
00:34:56,420 --> 00:34:55,110

little thing seems like it's a big deal

989
00:34:59,210 --> 00:34:56,430
to you but when you step back at the end

990
00:35:00,590 --> 00:34:59,220
of the mission you look at the recap you

991
00:35:02,720 --> 00:35:00,600
know I don't know that there's very much

992
00:35:05,600 --> 00:35:02,730
on that list even those those ammonia

993
00:35:07,610 --> 00:35:05,610
couplers that had problems that was not

994
00:35:11,330 --> 00:35:07,620
an unanticipated thing we had the backup

995
00:35:13,130 --> 00:35:11,340
plans we needed we had a few areas that

996
00:35:15,200 --> 00:35:13,140
have gotten nicknames like the rat's

997
00:35:16,520 --> 00:35:15,210
nest and and stuff where there's a lot

998
00:35:18,620 --> 00:35:16,530
of connections and a lot of access

999
00:35:20,870 --> 00:35:18,630
difficulties and again they were they

1000
00:35:23,270 --> 00:35:20,880
were known to be challenged points and I

1001
00:35:25,160 --> 00:35:23,280
think what you take away from it is not

1002
00:35:27,590 --> 00:35:25,170
so much the the things that went wrong

1003
00:35:29,570 --> 00:35:27,600
but all the work that went in to make

1004
00:35:31,670 --> 00:35:29,580
sure that they didn't go wrong I think

1005
00:35:34,070 --> 00:35:31,680
number of opportunities to have an issue

1006
00:35:36,530 --> 00:35:34,080
with an e VA in a station assembly was

1007
00:35:38,840 --> 00:35:36,540
was a very big number and the team did

1008
00:35:39,830 --> 00:35:38,850
an amazing job of making sure we never

1009
00:35:42,020 --> 00:35:39,840
found ourselves in one of those

1010
00:35:44,390 --> 00:35:42,030
situations so I can think of more

1011
00:35:45,860 --> 00:35:44,400
examples where we avoided a problem than

1012
00:35:47,780 --> 00:35:45,870
we actually had problems and that's a

1013
00:35:50,120 --> 00:35:47,790

that's a testament to the to the EV a

1014
00:35:51,830 --> 00:35:50,130
team and the station team to come up

1015
00:35:55,040 --> 00:35:51,840
with a very good system that that's got

1016
00:35:56,870 --> 00:35:55,050
a lot of robustness to it I will take

1017
00:35:58,250 --> 00:35:56,880
questions from two more reporters here

1018
00:36:02,830 --> 00:35:58,260
then we'll head off to Johnson Space

1019
00:36:07,460 --> 00:36:05,420
if I might line back this is obviously

1020
00:36:10,280 --> 00:36:07,470
the last time you going through the frr

1021
00:36:11,900 --> 00:36:10,290
process for a shuttle mission and many

1022
00:36:13,700 --> 00:36:11,910
of the workers working towards this last

1023
00:36:15,410 --> 00:36:13,710
mission know that they're going to be

1024
00:36:17,000 --> 00:36:15,420
out of work and losing their jobs once

1025
00:36:18,770 --> 00:36:17,010
that the orbiters back down on the

1026
00:36:21,020 --> 00:36:18,780
ground again how does everybody here

1027
00:36:22,400 --> 00:36:21,030
separate that emotion that knowledge in

1028
00:36:24,230 --> 00:36:22,410
their minds from the need to do a

1029
00:36:26,390 --> 00:36:24,240
thorough and professional job preparing

1030
00:36:27,860 --> 00:36:26,400
for this last mission and can you also

1031
00:36:30,440 --> 00:36:27,870
tell me a little bit more about the

1032
00:36:33,260 --> 00:36:30,450
general mood and atmosphere around KSC

1033
00:36:34,790 --> 00:36:33,270
is the program Weinstein please yeah I

1034
00:36:37,010 --> 00:36:34,800
think you use the right word use the

1035
00:36:38,720 --> 00:36:37,020
word professional and describing the

1036
00:36:40,460 --> 00:36:38,730
team and that's not just the launch team

1037
00:36:42,920 --> 00:36:40,470
as the processing team it's the ground

1038
00:36:44,180 --> 00:36:42,930

support team everyone that touches the

1039
00:36:46,280 --> 00:36:44,190
vehicle or the ground support equipment

1040
00:36:47,750 --> 00:36:46,290
as a true professional here at the

1041
00:36:50,540 --> 00:36:47,760
Kennedy Space Center and indeed

1042
00:36:52,580 --> 00:36:50,550
throughout the program and so with that

1043
00:36:54,560 --> 00:36:52,590
professionalism and their dedication to

1044
00:36:56,300 --> 00:36:54,570
the program over many many years comes

1045
00:36:58,940 --> 00:36:56,310
that becomes a commitment an internal

1046
00:37:00,500 --> 00:36:58,950
commitment to do the job right and as I

1047
00:37:03,020 --> 00:37:00,510
said before when when the folks are

1048
00:37:05,180 --> 00:37:03,030
doing their work on this amazing machine

1049
00:37:07,790 --> 00:37:05,190
I don't worry about it i know they're

1050
00:37:10,850 --> 00:37:07,800
going to do their job as perfectly as

1051
00:37:12,560 --> 00:37:10,860
they have in the past yes they know the

1052
00:37:15,290 --> 00:37:12,570
end is coming of course and we've known

1053
00:37:16,940 --> 00:37:15,300
for quite some time contractors have

1054
00:37:19,340 --> 00:37:16,950
done a great job in preparing the

1055
00:37:21,890 --> 00:37:19,350
workforce for other opportunities out

1056
00:37:23,510 --> 00:37:21,900
there but nevertheless you know the end

1057
00:37:24,980 --> 00:37:23,520
of a program something that a lot of

1058
00:37:28,610 --> 00:37:24,990
these folks have been with for 30 years

1059
00:37:30,140 --> 00:37:28,620
is a it's difficult and the mood is

1060
00:37:31,880 --> 00:37:30,150
getting more and more somber as you walk

1061
00:37:33,860 --> 00:37:31,890
down the hall when you're not on the job

1062
00:37:35,510 --> 00:37:33,870
site you're walking down the hall

1063
00:37:37,250 --> 00:37:35,520

talking to folks you know the end is is

1064
00:37:39,350 --> 00:37:37,260
just weeks away now where it used to be

1065
00:37:41,540 --> 00:37:39,360
years away so it's it's turning more

1066
00:37:43,340 --> 00:37:41,550
somber and but you know we're looking

1067
00:37:45,080 --> 00:37:43,350
forward to the future too and what the

1068
00:37:46,580 --> 00:37:45,090
what NASA has planned in the future and

1069
00:37:50,120 --> 00:37:46,590
hopefully that'll be exciting for the

1070
00:37:52,190 --> 00:37:50,130
county Space Center to last question

1071
00:37:55,850 --> 00:37:52,200
here before we go to JSC from Craig

1072
00:37:59,240 --> 00:37:55,860
cobalt thanks very much Craig covault

1073
00:38:02,080 --> 00:37:59,250
with aerospace America and pitching it

1074
00:38:06,410 --> 00:38:02,090
toward the future here what kind of a

1075
00:38:09,850 --> 00:38:06,420
intensive inventory exercises underway

1076
00:38:12,500 --> 00:38:09,860
from a component part of you the the

1077
00:38:17,110 --> 00:38:12,510
kind of hardware that you can shift over

1078
00:38:20,990 --> 00:38:17,120
to the SLS the Space Launch System let's

1079
00:38:23,120 --> 00:38:21,000
at least in a conceptual vein now and

1080
00:38:29,240 --> 00:38:23,130
I'm particularly interested in SS Emmys

1081
00:38:30,530 --> 00:38:29,250
and srms sun sea from a we've had known

1082
00:38:32,360 --> 00:38:30,540
about that for a while even long before

1083
00:38:34,670 --> 00:38:32,370
SLS got to find we've kind of had that

1084
00:38:36,590 --> 00:38:34,680
that lean against our hardware to say

1085
00:38:37,700 --> 00:38:36,600
you know what does the follow-on program

1086
00:38:40,760 --> 00:38:37,710
need

1087
00:38:44,420 --> 00:38:40,770
you know we decided the SS mes we're an

1088
00:38:46,760 --> 00:38:44,430

asset that were likely needs a program

1089
00:38:48,230 --> 00:38:46,770
with bills help went out on a limb a

1090
00:38:50,480 --> 00:38:48,240
little bit to say let's go ahead and

1091
00:38:52,910 --> 00:38:50,490
protect them in in storage a little

1092
00:38:55,099 --> 00:38:52,920
longer and then and then we come up with

1093
00:38:56,240 --> 00:38:55,109
a system that might need to use them it

1094
00:39:00,320 --> 00:38:56,250
looks like we might be headed that way

1095
00:39:03,770 --> 00:39:00,330
so those assets are available the all

1096
00:39:07,400 --> 00:39:03,780
the SRB hardware is being stored in in

1097
00:39:09,800 --> 00:39:07,410
not flight condition storage but in in a

1098
00:39:12,500 --> 00:39:09,810
in a reasonable enough shape that it's

1099
00:39:15,260 --> 00:39:12,510
it's reusable and restorable if needed

1100
00:39:17,690 --> 00:39:15,270
and then there's the detailed specifics

1101
00:39:19,280 --> 00:39:17,700
of plumbing components valve components

1102
00:39:21,349 --> 00:39:19,290
that you really need to get a little

1103
00:39:22,849 --> 00:39:21,359
more maturity on the design of the next

1104
00:39:24,770 --> 00:39:22,859
vehicle before you know exactly what you

1105
00:39:27,349 --> 00:39:24,780
may or may not want to take from this

1106
00:39:29,210 --> 00:39:27,359
programs hardware and so we have all the

1107
00:39:31,280 --> 00:39:29,220
mechanisms in place to go identify that

1108
00:39:33,530 --> 00:39:31,290
hardware and then be able to take it out

1109
00:39:35,630 --> 00:39:33,540
and keep it in a you know flight spares

1110
00:39:37,550 --> 00:39:35,640
condition if needed but but that's still

1111
00:39:39,589 --> 00:39:37,560
an ongoing process it's it's basically

1112
00:39:41,000 --> 00:39:39,599
underway right now at the Marshall Space

1113
00:39:43,370 --> 00:39:41,010

Flight Center to identify what hardware

1114
00:39:45,710 --> 00:39:43,380
may or may not be needed and it's open

1115
00:39:48,079 --> 00:39:45,720
work pending on on all three vehicles as

1116
00:39:49,400 --> 00:39:48,089
we retire them down here at at Kennedy

1117
00:39:52,370 --> 00:39:49,410
to decide what needs to come out and be

1118
00:39:53,630 --> 00:39:52,380
saved and I just might add a little bit

1119
00:39:55,130 --> 00:39:53,640
to that too from it from a ground

1120
00:39:57,230 --> 00:39:55,140
processing perspective we're going

1121
00:39:58,940 --> 00:39:57,240
through a sense of that same process you

1122
00:40:00,770 --> 00:39:58,950
know we're identifying ground support

1123
00:40:03,109 --> 00:40:00,780
equipment that may be applicable to some

1124
00:40:05,030 --> 00:40:03,119
future program or if it's truly shuttle

1125
00:40:06,079 --> 00:40:05,040
unique and probably will never be used

1126
00:40:08,660 --> 00:40:06,089
by another program well that's a

1127
00:40:10,310 --> 00:40:08,670
different story but but things like an

1128
00:40:11,990 --> 00:40:10,320
ammonia servicing cart well most most

1129
00:40:14,060 --> 00:40:12,000
space vehicles have ammonia on board and

1130
00:40:16,400 --> 00:40:14,070
so things like that we're taking special

1131
00:40:18,410 --> 00:40:16,410
care not to not to throw away we're

1132
00:40:20,750 --> 00:40:18,420
inventory at all we're going to keep it

1133
00:40:22,400 --> 00:40:20,760
in good shape for the future hopefully

1134
00:40:24,050 --> 00:40:22,410
another customer will want those those

1135
00:40:26,720 --> 00:40:24,060
types of ground support equipment items

1136
00:40:28,550 --> 00:40:26,730
as well we have a transition control

1137
00:40:30,770 --> 00:40:28,560
board where we kind of look at each

1138
00:40:32,510 --> 00:40:30,780

individual component each individual

1139
00:40:34,400 --> 00:40:32,520
facility and then we try to make our

1140
00:40:36,020 --> 00:40:34,410
best judgment about just something we

1141
00:40:37,280 --> 00:40:36,030
might be able to use is this something

1142
00:40:38,780 --> 00:40:37,290
that we're not going to use those are

1143
00:40:40,790 --> 00:40:38,790
two the two broad categories and then

1144
00:40:43,190 --> 00:40:40,800
there's this kind of in gray zone and

1145
00:40:44,810 --> 00:40:43,200
then we try to figure out where we think

1146
00:40:47,210 --> 00:40:44,820
our highest probability is to keep stuff

1147
00:40:49,040 --> 00:40:47,220
around and we also look at how easy it

1148
00:40:50,930 --> 00:40:49,050
would be to replace if once we let it go

1149
00:40:52,760 --> 00:40:50,940
that's another consideration we actually

1150
00:40:54,260 --> 00:40:52,770
right a pretty thorough document where

1151
00:40:56,089 --> 00:40:54,270
we analyze each one of these components

1152
00:40:58,160 --> 00:40:56,099
to see what its value is to the Future

1153
00:40:59,839 --> 00:40:58,170
program its ability to be replaced and

1154
00:41:01,130 --> 00:40:59,849
the criticality and then we make a

1155
00:41:02,809 --> 00:41:01,140
decision about whether we want to keep

1156
00:41:04,460 --> 00:41:02,819
it around for an extended duration or

1157
00:41:06,920 --> 00:41:04,470
not so it's a it's a pretty thorough

1158
00:41:08,480 --> 00:41:06,930
process we've gone through it for a lot

1159
00:41:10,220 --> 00:41:08,490
of the major components up to this point

1160
00:41:14,150 --> 00:41:10,230
we'll continue to do that through the

1161
00:41:16,099 --> 00:41:14,160
remainder this year okay well let's take

1162
00:41:20,240 --> 00:41:16,109
questions now from Houston the Johnson

1163
00:41:22,490 --> 00:41:20,250

Space Center go ahead please yeah thanks

1164
00:41:26,809 --> 00:41:22,500
mark kuro for aviation week I think this

1165
00:41:29,569 --> 00:41:26,819
is for Mike Leinbach up once the launch

1166
00:41:33,140 --> 00:41:29,579
period opens on july eight how many days

1167
00:41:35,599 --> 00:41:33,150
can you go before you have to resurface

1168
00:41:37,640 --> 00:41:35,609
the PRS d in order to preserve the

1169
00:41:39,620 --> 00:41:37,650
12-day mission is it is it can you go

1170
00:41:42,980 --> 00:41:39,630
through the 10th is that way you we

1171
00:41:44,809 --> 00:41:42,990
implied earlier or is that too long yeah

1172
00:41:47,030 --> 00:41:44,819
no that's that's exactly right Craig we

1173
00:41:49,940 --> 00:41:47,040
can go all the way through the 10th with

1174
00:41:52,099 --> 00:41:49,950
no problems at all and again if we're

1175
00:41:53,990 --> 00:41:52,109
still on the ground after the tenth you

1176
00:41:55,280 --> 00:41:54,000
know I suspect the shuttle program along

1177
00:41:56,930 --> 00:41:55,290
with the Delta program will talk about

1178
00:41:58,880 --> 00:41:56,940
other opportunities but right now we're

1179
00:42:00,470 --> 00:41:58,890
we're saying we have 8th 9th and 10th

1180
00:42:05,620 --> 00:42:00,480
launch and we would not have to top off

1181
00:42:09,680 --> 00:42:07,849
hi this is Robert Pearlman with

1182
00:42:12,800 --> 00:42:09,690
collectspace.com with a question I think

1183
00:42:14,930 --> 00:42:12,810
for Mike Moses I believe the current

1184
00:42:16,819 --> 00:42:14,940
projections are that if it lands lands

1185
00:42:19,880 --> 00:42:16,829
on any other day but July twentieth

1186
00:42:22,880 --> 00:42:19,890
it'll be a night landing is that correct

1187
00:42:24,500 --> 00:42:22,890
and would there be any consideration by

1188
00:42:26,599 --> 00:42:24,510

the program because this is the last

1189
00:42:28,250 --> 00:42:26,609
landing to do some type of other orbital

1190
00:42:31,160 --> 00:42:28,260
maneuver to bring back landing to the

1191
00:42:34,339 --> 00:42:31,170
day so that the last landing can be seen

1192
00:42:36,440 --> 00:42:34,349
in full daylight Thanks yeah Robert no

1193
00:42:38,599 --> 00:42:36,450
no specific accommodations being made

1194
00:42:40,130 --> 00:42:38,609
just for that reason but yeah the

1195
00:42:42,260 --> 00:42:40,140
landing time would back up a little bit

1196
00:42:45,140 --> 00:42:42,270
there's a whole list of constraints that

1197
00:42:49,069 --> 00:42:45,150
go into deorbit burn planning cross

1198
00:42:50,720 --> 00:42:49,079
range capability attitude lighting

1199
00:42:53,690 --> 00:42:50,730
conditions are one of them you want to

1200
00:42:55,910 --> 00:42:53,700
avoid the direct glare of sunrise or

1201
00:42:58,220 --> 00:42:55,920
sunset so we go through that whole list

1202
00:43:00,800 --> 00:42:58,230
and that would drive what the right the

1203
00:43:02,930 --> 00:43:00,810
right burn or over to adjustment to get

1204
00:43:04,760 --> 00:43:02,940
the burn where it needs to be but no

1205
00:43:05,960 --> 00:43:04,770
nothing on that list says

1206
00:43:12,170 --> 00:43:05,970
try to make it a daylight landing just

1207
00:43:14,600 --> 00:43:12,180
because it's the last one unison Sarah

1208
00:43:17,390 --> 00:43:14,610
ABC News 4 bill bill would you take me

1209
00:43:19,880 --> 00:43:17,400
to what happens when you get notice of a

1210
00:43:22,040 --> 00:43:19,890
conjunction the process who gets the

1211
00:43:24,610 --> 00:43:22,050
phone call at midnight and what steps

1212
00:43:26,900 --> 00:43:24,620
you take and how you analyze it

1213
00:43:30,020 --> 00:43:26,910

typically what happens is the flight

1214
00:43:31,400 --> 00:43:30,030
dynamic officer I think it's the it's

1215
00:43:32,930 --> 00:43:31,410
got a different name in the station

1216
00:43:34,730 --> 00:43:32,940
world but it's essentially the person

1217
00:43:36,380 --> 00:43:34,740
that keeps track of the orbital

1218
00:43:38,060 --> 00:43:36,390
mechanics of the station and does

1219
00:43:40,190 --> 00:43:38,070
reboost planning those kind of things

1220
00:43:41,930 --> 00:43:40,200
they'd get a notification they would

1221
00:43:43,910 --> 00:43:41,940
immediately inform the flight director

1222
00:43:45,140 --> 00:43:43,920
the flight director would then have

1223
00:43:46,880 --> 00:43:45,150
discussions with the Russian

1224
00:43:49,010 --> 00:43:46,890
counterparts about what needs to be done

1225
00:43:50,660 --> 00:43:49,020
yeah I says program would be brought

1226
00:43:52,130 --> 00:43:50,670
into the same discussion to make sure

1227
00:43:55,640 --> 00:43:52,140
that programmatically they're aware of

1228
00:43:57,800 --> 00:43:55,650
what's occurring management is needed to

1229
00:43:59,450 --> 00:43:57,810
make a decision the ISS mission

1230
00:44:01,700 --> 00:43:59,460
management team would make that decision

1231
00:44:05,090 --> 00:44:01,710
on what what the planning is for the

1232
00:44:06,890 --> 00:44:05,100
burn that me needs to be done so if we

1233
00:44:08,510 --> 00:44:06,900
know in advance will start this process

1234
00:44:10,760 --> 00:44:08,520
and we'll kind of do the preliminary

1235
00:44:12,500 --> 00:44:10,770
paperwork will exchange the burn

1236
00:44:14,150 --> 00:44:12,510
information with the Russians to get

1237
00:44:15,830 --> 00:44:14,160
ready for that activity but then when we

1238
00:44:17,660 --> 00:44:15,840

get like an immediate notification of

1239
00:44:20,720 --> 00:44:17,670
this one I think we had 14 hours notice

1240
00:44:23,090 --> 00:44:20,730
before the event in that case the flight

1241
00:44:25,580 --> 00:44:23,100
director was immediately contacted the

1242
00:44:27,260 --> 00:44:25,590
flight director then informed the ISS

1243
00:44:30,050 --> 00:44:27,270
program management team they informed

1244
00:44:31,580 --> 00:44:30,060
broader management and then we worked

1245
00:44:33,200 --> 00:44:31,590
out with the crew and the flight rules

1246
00:44:35,080 --> 00:44:33,210
are pretty specific about what we do for

1247
00:44:37,070 --> 00:44:35,090
these cases and it was essentially to

1248
00:44:38,780 --> 00:44:37,080
shelter in place to get into the

1249
00:44:40,750 --> 00:44:38,790
respective so uses and actually close

1250
00:44:43,340 --> 00:44:40,760
the hatches and prepare in case

1251
00:44:45,470 --> 00:44:43,350
something occurred and and so that's the

1252
00:44:47,090 --> 00:44:45,480
basic process that we go through and on

1253
00:44:48,680 --> 00:44:47,100
the station said that's the topo the

1254
00:44:52,010 --> 00:44:48,690
trajectory operations planning officer

1255
00:44:54,110 --> 00:44:52,020
yeah that's all the questions from JSC

1256
00:44:58,010 --> 00:44:54,120
so let's go to the phone line and see if

1257
00:45:01,120 --> 00:44:58,020
Denise Chow has any questions hi Denise

1258
00:45:04,340 --> 00:45:01,130
Chow face calm question for Mike Moses

1259
00:45:06,110 --> 00:45:04,350
mentioned that for adding an extra day

1260
00:45:08,510 --> 00:45:06,120
you'll wait until either the second or

1261
00:45:09,680 --> 00:45:08,520
third day of docked operations about the

1262
00:45:11,180 --> 00:45:09,690
latest time that you can make that

1263
00:45:13,820 --> 00:45:11,190

decision or can you sort of do a

1264
00:45:15,230 --> 00:45:13,830
wait-and-see longer than that and hold

1265
00:45:17,960 --> 00:45:15,240
off on making that decision of adding an

1266
00:45:19,200 --> 00:45:17,970
extra day yeah conceivably we certainly

1267
00:45:20,730 --> 00:45:19,210
could wait

1268
00:45:23,300 --> 00:45:20,740
and we would we would do so if we were

1269
00:45:26,339 --> 00:45:23,310
kind of marginal on the support numbers

1270
00:45:29,280 --> 00:45:26,349
talking to the the mission operations

1271
00:45:31,530 --> 00:45:29,290
team and the planning folks the day that

1272
00:45:33,450 --> 00:45:31,540
they think they dad is around the flight

1273
00:45:35,130 --> 00:45:33,460
day 89 timeframe was where you kind of

1274
00:45:36,599 --> 00:45:35,140
insert that extra day so the crew would

1275
00:45:38,730 --> 00:45:36,609
be running the normal plan up until that

1276
00:45:40,589 --> 00:45:38,740
time you'd like to give them a little

1277
00:45:42,450 --> 00:45:40,599
notice so they have time to replan and

1278
00:45:44,460 --> 00:45:42,460
reschedule but but yeah we can certainly

1279
00:45:47,460 --> 00:45:44,470
wait a little longer probably flight day

1280
00:45:52,950 --> 00:45:47,470
five or six till we till we need to make

1281
00:45:59,849 --> 00:45:52,960
any decisions Denise any other questions

1282
00:46:03,839 --> 00:45:59,859
oh ok I think that was it so we're back

1283
00:46:05,240 --> 00:46:03,849
here at Kennedy and Jay barberry bill we

1284
00:46:07,920 --> 00:46:05,250
got the announcement on the

1285
00:46:10,560 --> 00:46:07,930
multi-purpose crew vehicle everything

1286
00:46:12,750 --> 00:46:10,570
here not too long ago is any hope of

1287
00:46:15,839 --> 00:46:12,760
getting an announcement anytime soon on

1288
00:46:18,599 --> 00:46:15,849

heavy lift we're working through all the

1289
00:46:21,359 --> 00:46:18,609
trades and all the analysis that goes

1290
00:46:23,220 --> 00:46:21,369
along with that and I don't know we'll

1291
00:46:24,960 --> 00:46:23,230
see we're working as fast as we can to

1292
00:46:30,839 --> 00:46:24,970
get some kind of announcement out as

1293
00:46:32,849 --> 00:46:30,849
soon as we can for the launch marcia

1294
00:46:34,950 --> 00:46:32,859
marcia dunn Associated Press two quick

1295
00:46:37,170 --> 00:46:34,960
questions for bill did I hear you say

1296
00:46:38,970 --> 00:46:37,180
earlier that this piece of debris that

1297
00:46:41,310 --> 00:46:38,980
went by the space station this morning

1298
00:46:43,260 --> 00:46:41,320
was the closest a piece of junk has ever

1299
00:46:46,230 --> 00:46:43,270
come to the space station yeah that's

1300
00:46:48,900 --> 00:46:46,240
whatever and everything's looking great

1301
00:46:52,170 --> 00:46:48,910
for the eighth but if the launch slips

1302
00:46:56,520 --> 00:46:52,180
significantly is there a line in the

1303
00:46:58,680 --> 00:46:56,530
sand or any kind of date where you just

1304
00:47:01,970 --> 00:46:58,690
can afford to keep the shuttle sitting

1305
00:47:05,640 --> 00:47:01,980
on the pad since it is the last one

1306
00:47:07,829 --> 00:47:05,650
again I think we have sufficient funding

1307
00:47:09,300 --> 00:47:07,839
to keep trying for another period of

1308
00:47:10,770 --> 00:47:09,310
time we need to keep working with the

1309
00:47:12,810 --> 00:47:10,780
teams and make sure we're really ready

1310
00:47:15,000 --> 00:47:12,820
to go do this mission is I described

1311
00:47:17,609 --> 00:47:15,010
earlier this mission is really really

1312
00:47:19,290 --> 00:47:17,619
critical to an ISS standpoint so we want

1313
00:47:20,820 --> 00:47:19,300

to do this mission but we got to make

1314
00:47:22,560 --> 00:47:20,830
sure that in our zeal to get this

1315
00:47:23,700 --> 00:47:22,570
mission done we don't cross some safety

1316
00:47:25,650 --> 00:47:23,710
line where we don't have adequate

1317
00:47:27,300 --> 00:47:25,660
support to go staff the mission or

1318
00:47:29,579 --> 00:47:27,310
something's occurred from a team

1319
00:47:31,099 --> 00:47:29,589
standpoint that is not right you know

1320
00:47:33,499 --> 00:47:31,109
we'll do the right thing overall

1321
00:47:36,319 --> 00:47:33,509
but but we you know we have funds to go

1322
00:47:37,849 --> 00:47:36,329
ahead and continue for a while if we

1323
00:47:39,440 --> 00:47:37,859
have to keep slipping and our intent

1324
00:47:41,059 --> 00:47:39,450
would be to fly this mission as long as

1325
00:47:42,319 --> 00:47:41,069
we're ready to go fly this mission in a

1326
00:47:47,089 --> 00:47:42,329
safe manner and will continue to

1327
00:47:50,170 --> 00:47:47,099
evaluate that as we go forward how would

1328
00:47:53,359 --> 00:47:50,180
you define for a while a couple months

1329
00:47:54,650 --> 00:47:53,369
yep let's take it in and then you know

1330
00:47:55,910 --> 00:47:54,660
how we work things right I'll tell you a

1331
00:47:57,680 --> 00:47:55,920
couple months now and then I'll figure

1332
00:48:00,440 --> 00:47:57,690
out some magical plan and will extend

1333
00:48:02,150 --> 00:48:00,450
that a couple more months so so so the

1334
00:48:05,269 --> 00:48:02,160
immediate NASA to answer is a couple

1335
00:48:07,039 --> 00:48:05,279
months okay I taught and then we'll take

1336
00:48:09,440 --> 00:48:07,049
a question from Richard okay todd

1337
00:48:13,069 --> 00:48:09,450
halvorson of florida today for anybody

1338
00:48:15,380 --> 00:48:13,079

who would like to fill this one a lot of

1339
00:48:18,620 --> 00:48:15,390
people are going to be looking back at

1340
00:48:22,190 --> 00:48:18,630
30 years of shuttle operations and and

1341
00:48:24,739 --> 00:48:22,200
the money spent over time to have

1342
00:48:25,970 --> 00:48:24,749
ventures in low-earth orbit and i'm

1343
00:48:29,960 --> 00:48:25,980
thinking that some people out there

1344
00:48:32,779 --> 00:48:29,970
going to question whether the shuttle

1345
00:48:35,059 --> 00:48:32,789
program was worth the expense and i'm

1346
00:48:37,910 --> 00:48:35,069
wondering if you got that question from

1347
00:48:46,130 --> 00:48:37,920
somebody on the street what would your

1348
00:48:49,849 --> 00:48:46,140
answer be and why it's curse tomorrow's

1349
00:48:51,739 --> 00:48:49,859
money okay why I'll start a nice guys

1350
00:48:54,339 --> 00:48:51,749
can help right I would say it's

1351
00:48:57,559 --> 00:48:54,349
definitely worth our money i mean if if

1352
00:49:00,529 --> 00:48:57,569
i look at what we've accomplished you

1353
00:49:02,479 --> 00:49:00,539
know when we started this program as you

1354
00:49:04,220 --> 00:49:02,489
described earlier right we could barely

1355
00:49:05,660 --> 00:49:04,230
do space walks right and then look how

1356
00:49:06,829 --> 00:49:05,670
many spacewalks we were able to do

1357
00:49:08,779 --> 00:49:06,839
throughout the history of the shuttle

1358
00:49:11,089 --> 00:49:08,789
program not only for is assembly but in

1359
00:49:13,579 --> 00:49:11,099
general you know we've gone from where

1360
00:49:16,430 --> 00:49:13,589
we we went to space and we touch space

1361
00:49:18,049 --> 00:49:16,440
and we came back we now are really in a

1362
00:49:20,180 --> 00:49:18,059
posture where we're learning to live in

1363
00:49:23,390 --> 00:49:20,190

space and operate in space which i think

1364
00:49:25,640 --> 00:49:23,400
is a tremendous challenge to us as a

1365
00:49:27,470 --> 00:49:25,650
species and also helps us and drives us

1366
00:49:28,900 --> 00:49:27,480
from a technology standpoint I would

1367
00:49:31,309 --> 00:49:28,910
also say if you look at how

1368
00:49:33,229 --> 00:49:31,319
computational fluid dynamics has changed

1369
00:49:36,410 --> 00:49:33,239
you know what we can do today in terms

1370
00:49:37,880 --> 00:49:36,420
of debris loss is lightyears different

1371
00:49:40,549 --> 00:49:37,890
than what we could do before and that

1372
00:49:42,739 --> 00:49:40,559
same computational fluid dynamics helps

1373
00:49:44,690 --> 00:49:42,749
us design better aircraft engines helps

1374
00:49:47,240 --> 00:49:44,700
us design better wings for aircraft

1375
00:49:49,760 --> 00:49:47,250
it pays real benefits to real folks here

1376
00:49:51,410 --> 00:49:49,770
on the earth we understand combustion

1377
00:49:53,930 --> 00:49:51,420
properties much better than we've done

1378
00:49:57,290 --> 00:49:53,940
before I mean that has real benefits so

1379
00:49:59,359 --> 00:49:57,300
the technology advance of taking a step

1380
00:50:01,579 --> 00:49:59,369
or pushing beyond what you think is

1381
00:50:03,170 --> 00:50:01,589
reasonable and going for that that high

1382
00:50:05,180 --> 00:50:03,180
bar and saying that high standard for

1383
00:50:07,339 --> 00:50:05,190
yourself drives better performance for

1384
00:50:09,230 --> 00:50:07,349
the team I can also tell you that there

1385
00:50:10,910 --> 00:50:09,240
is no better workforce than this

1386
00:50:12,500 --> 00:50:10,920
workforce down here at Kennedy and

1387
00:50:14,420 --> 00:50:12,510
Houston and throughout the world to

1388
00:50:17,270 --> 00:50:14,430

support space these folks are

1389
00:50:21,050 --> 00:50:17,280
tremendously dedicated their ability to

1390
00:50:24,829 --> 00:50:21,060
plan and to schedule is is phenomenal

1391
00:50:27,109 --> 00:50:24,839
you know they have a valve failure and

1392
00:50:28,970 --> 00:50:27,119
they immediately have got plans in there

1393
00:50:31,520 --> 00:50:28,980
hi crews out there figuring out how to

1394
00:50:33,349 --> 00:50:31,530
get scaffolding out there the the engine

1395
00:50:35,359 --> 00:50:33,359
guys come tell me it's as good as

1396
00:50:37,040 --> 00:50:35,369
changing it out in the engine shop they

1397
00:50:39,020 --> 00:50:37,050
put the platforms in place so they could

1398
00:50:41,720 --> 00:50:39,030
get there there wasn't a whole lot of

1399
00:50:43,220 --> 00:50:41,730
fuss and muss they know what their job

1400
00:50:44,839 --> 00:50:43,230
is they know how to go do things they

1401
00:50:47,569 --> 00:50:44,849
know how to plan they know how to react

1402
00:50:49,430 --> 00:50:47,579
and that's invaluable in any industry or

1403
00:50:51,620 --> 00:50:49,440
any skill so these skills that people

1404
00:50:53,540 --> 00:50:51,630
have individually learned that fit on

1405
00:50:55,880 --> 00:50:53,550
their resumes today are invaluable for

1406
00:50:57,260 --> 00:50:55,890
the future so I you know I'm clearly

1407
00:50:59,450 --> 00:50:57,270
biased because I've been doing this my

1408
00:51:01,339 --> 00:50:59,460
whole life but I will tell you that I

1409
00:51:03,140 --> 00:51:01,349
think this has really pushed our country

1410
00:51:05,300 --> 00:51:03,150
well we have done a tremendous service

1411
00:51:07,700 --> 00:51:05,310
for our country and advancing technology

1412
00:51:09,559 --> 00:51:07,710
and scientific research and the program

1413
00:51:12,290 --> 00:51:09,569

was clearly worth everything we spent on

1414
00:51:14,480 --> 00:51:12,300
it to this point yeah I'd agree right

1415
00:51:16,730 --> 00:51:14,490
the technical tangible things you know

1416
00:51:18,650 --> 00:51:16,740
one of the things that the the Kennedy

1417
00:51:20,870 --> 00:51:18,660
engineering team kind of used as a

1418
00:51:22,370 --> 00:51:20,880
lesson learned the other day is as we've

1419
00:51:24,109 --> 00:51:22,380
gone through all this problems we've had

1420
00:51:25,130 --> 00:51:24,119
with orbiter wiring and how it ages over

1421
00:51:27,170 --> 00:51:25,140
the years and the fact that you can't

1422
00:51:29,630 --> 00:51:27,180
get out all of it they developed a

1423
00:51:31,670 --> 00:51:29,640
technique that basically kind of does

1424
00:51:33,710 --> 00:51:31,680
remote scanning you send a high current

1425
00:51:35,000 --> 00:51:33,720
signal down that wire and it can come

1426
00:51:36,290 --> 00:51:35,010
back and tell you if you're bleeding out

1427
00:51:38,450 --> 00:51:36,300
current because you have an insulation

1428
00:51:40,339 --> 00:51:38,460
break somewhere that's now technology

1429
00:51:43,640 --> 00:51:40,349
that's out there in industry being used

1430
00:51:45,200 --> 00:51:43,650
around the world to help reduce reduce

1431
00:51:47,329 --> 00:51:45,210
the manpower required to track down

1432
00:51:50,569 --> 00:51:47,339
wiring problems so there's all those

1433
00:51:52,520 --> 00:51:50,579
tangible direct benefits I'll step back

1434
00:51:55,250 --> 00:51:52,530
and say it's the intangible stuff that

1435
00:51:57,470 --> 00:51:55,260
always inspired me the fact that it's a

1436
00:51:58,460 --> 00:51:57,480
noble purpose to go do this kind of

1437
00:52:01,400 --> 00:51:58,470
thing in

1438
00:52:03,200 --> 00:52:01,410

in space that is just an inspiration I

1439
00:52:05,089 --> 00:52:03,210
mean to think about the stuff we're

1440
00:52:07,160 --> 00:52:05,099
doing robotically and somewhere there's

1441
00:52:08,870 --> 00:52:07,170
some kid watching dexter out there

1442
00:52:10,910 --> 00:52:08,880
remotely manipulating things and comes

1443
00:52:12,980 --> 00:52:10,920
up with some idea of how we can do that

1444
00:52:14,750 --> 00:52:12,990
differently it drives all the the

1445
00:52:17,060 --> 00:52:14,760
surgical robotics that we do here on the

1446
00:52:19,849 --> 00:52:17,070
ground all that one doesn't cause the

1447
00:52:21,470 --> 00:52:19,859
other but as a collective it shows what

1448
00:52:23,030 --> 00:52:21,480
the advancement of science and

1449
00:52:25,460 --> 00:52:23,040
technology really does for our species

1450
00:52:27,320 --> 00:52:25,470
as a as a benefit if you think about

1451
00:52:29,810 --> 00:52:27,330
what we have available to us

1452
00:52:31,910 --> 00:52:29,820
technologically today as opposed to what

1453
00:52:34,730 --> 00:52:31,920
you know the generation before us had

1454
00:52:36,230 --> 00:52:34,740
it's it's pretty remarkable to me that

1455
00:52:38,180 --> 00:52:36,240
the space program is an inspiration to

1456
00:52:40,220 --> 00:52:38,190
keep pushing on that and and so I think

1457
00:52:42,530 --> 00:52:40,230
just like Bill every dollar was worth it

1458
00:52:45,109 --> 00:52:42,540
and I think you know from my perspective

1459
00:52:48,140 --> 00:52:45,119
take a little bit of a different view of

1460
00:52:50,150 --> 00:52:48,150
it i'm more of a philosophical person

1461
00:52:52,640 --> 00:52:50,160
when it comes to describing the benefits

1462
00:52:56,300 --> 00:52:52,650
of the shuttle program and the station

1463
00:52:58,160 --> 00:52:56,310

program you know we've we've gone into

1464
00:52:59,660 --> 00:52:58,170
international partnerships and low Earth

1465
00:53:02,930 --> 00:52:59,670
orbit something that hadn't been done

1466
00:53:04,430 --> 00:53:02,940
before except for one test flight we

1467
00:53:06,260 --> 00:53:04,440
started that with a mere program and

1468
00:53:08,420 --> 00:53:06,270
prove that that we could do that with

1469
00:53:09,890 --> 00:53:08,430
the Russians International Space Station

1470
00:53:11,390 --> 00:53:09,900
program look at that and the

1471
00:53:13,849 --> 00:53:11,400
partnerships that evolved over time

1472
00:53:15,620 --> 00:53:13,859
there and it's not too much of a stretch

1473
00:53:17,510 --> 00:53:15,630
to think of Star Trek and the

1474
00:53:21,050 --> 00:53:17,520
international flavor of the bridge of

1475
00:53:23,270 --> 00:53:21,060
the spaceship Star Trek Enterprise so

1476
00:53:26,810 --> 00:53:23,280
we're really beginning the next the next

1477
00:53:29,690 --> 00:53:26,820
step of evolution in off of the planet

1478
00:53:32,240 --> 00:53:29,700
Earth I mean exploration is in the human

1479
00:53:34,550 --> 00:53:32,250
soul it's what we do it's part of what

1480
00:53:36,560 --> 00:53:34,560
makes humans human and I believe

1481
00:53:38,390 --> 00:53:36,570
learning to live and work and low Earth

1482
00:53:40,400 --> 00:53:38,400
orbit is the next step in that evolution

1483
00:53:42,320 --> 00:53:40,410
and and and the next step after that

1484
00:53:44,510 --> 00:53:42,330
will be to maybe back to the moon maybe

1485
00:53:46,760 --> 00:53:44,520
to an ER near-earth object maybe to Mars

1486
00:53:48,710 --> 00:53:46,770
I don't know but I do know that that

1487
00:53:50,150 --> 00:53:48,720
living learning to live and work in

1488
00:53:52,339 --> 00:53:50,160

low-earth orbit was the next logical

1489
00:53:54,380 --> 00:53:52,349
step and the shuttle program has proven

1490
00:53:56,510 --> 00:53:54,390
that and it's part of an evolutionary

1491
00:53:59,599 --> 00:53:56,520
process that the species will go through

1492
00:54:01,460 --> 00:53:59,609
for eons and so we will look back on

1493
00:54:03,500 --> 00:54:01,470
this I'd like to be reincarnated two or

1494
00:54:05,690 --> 00:54:03,510
three hundred years from now on and see

1495
00:54:08,359 --> 00:54:05,700
what and see what Marvel's are going to

1496
00:54:11,060 --> 00:54:08,369
be with us on this planet and elsewhere

1497
00:54:12,020 --> 00:54:11,070
of course that's not possible so we're

1498
00:54:14,150 --> 00:54:12,030
doing now what

1499
00:54:16,580 --> 00:54:14,160
what we're setting up for the next step

1500
00:54:19,790 --> 00:54:16,590
in evolution of space exploration and

1501
00:54:21,650 --> 00:54:19,800
I'm looking forward to seeing it will

1502
00:54:23,330 --> 00:54:21,660
take one last question here from richer

1503
00:54:25,730 --> 00:54:23,340
before we let these gentlemen go for the

1504
00:54:28,520 --> 00:54:25,740
day go ahead Richard luscombe for the

1505
00:54:30,740 --> 00:54:28,530
guardian for anyone who fancies it we're

1506
00:54:32,810 --> 00:54:30,750
now about to enter a period and extended

1507
00:54:34,820 --> 00:54:32,820
period of no manned launches from the

1508
00:54:36,290 --> 00:54:34,830
American space program here and when

1509
00:54:37,940 --> 00:54:36,300
previous programs are finished there's

1510
00:54:41,480 --> 00:54:37,950
always been a follow-on program coming

1511
00:54:43,040 --> 00:54:41,490
there's still uncertainty now how will

1512
00:54:44,660 --> 00:54:43,050
sort of things do you point to that NASA

1513
00:54:47,720 --> 00:54:44,670

is going to continue to do during that

1514
00:54:49,730 --> 00:54:47,730
period to inspire children to continue

1515
00:54:52,640 --> 00:54:49,740
to want to take up careers in science

1516
00:54:54,650 --> 00:54:52,650
and engineering and space how difficult

1517
00:54:56,330 --> 00:54:54,660
is it going to be without launch is

1518
00:55:01,100 --> 00:54:56,340
taking place mayor to keep that

1519
00:55:02,780 --> 00:55:01,110
inspiration you know I think one thing

1520
00:55:06,020 --> 00:55:02,790
we need to think about is how we use

1521
00:55:07,670 --> 00:55:06,030
station in more of a real world you know

1522
00:55:08,990 --> 00:55:07,680
it's it's really nice when you can come

1523
00:55:11,030 --> 00:55:09,000
here to Kennedy and you can watch a

1524
00:55:13,190 --> 00:55:11,040
launch because then in a sense you can

1525
00:55:15,980 --> 00:55:13,200
participate in that launch right you can

1526
00:55:18,110 --> 00:55:15,990
you can see the launch you can feel the

1527
00:55:21,590 --> 00:55:18,120
sound waves reflect off your body and in

1528
00:55:23,420 --> 00:55:21,600
a sense you get a real tangible feel for

1529
00:55:25,460 --> 00:55:23,430
what's going on what we need to think

1530
00:55:28,700 --> 00:55:25,470
about is in station through through

1531
00:55:30,170 --> 00:55:28,710
maybe internet connections let students

1532
00:55:32,480 --> 00:55:30,180
actually robotically we're letting

1533
00:55:34,970 --> 00:55:32,490
robotically now program spacecraft that

1534
00:55:37,310 --> 00:55:34,980
fly inside space station so how can we

1535
00:55:38,900 --> 00:55:37,320
give more of a real feel to students of

1536
00:55:40,340 --> 00:55:38,910
what's going on with space station so

1537
00:55:42,830 --> 00:55:40,350
they can get a sense that they're part

1538
00:55:45,230 --> 00:55:42,840

of the program and it's not just you

1539
00:55:47,050 --> 00:55:45,240
know select few folks doing experiments

1540
00:55:49,880 --> 00:55:47,060
in space how can we make station

1541
00:55:51,500 --> 00:55:49,890
activities more real to students and and

1542
00:55:53,420 --> 00:55:51,510
we see that even you know we're doing

1543
00:55:55,340 --> 00:55:53,430
some of these tweetup activities here

1544
00:55:57,710 --> 00:55:55,350
where we bring folks in to talk about

1545
00:55:59,480 --> 00:55:57,720
things we're doing some Ron Garon's

1546
00:56:01,190 --> 00:55:59,490
doing a fragile planet activity from

1547
00:56:02,780 --> 00:56:01,200
space station and connecting through

1548
00:56:04,370 --> 00:56:02,790
social media with folks here on the

1549
00:56:06,320 --> 00:56:04,380
ground so we need to figure out a way

1550
00:56:08,960 --> 00:56:06,330
that we could we can bridge a more

1551
00:56:10,640 --> 00:56:08,970
tangible real feel to what we're doing

1552
00:56:12,740 --> 00:56:10,650
on station so station doesn't get

1553
00:56:15,980 --> 00:56:12,750
bypassed you know there's lots of

1554
00:56:17,450 --> 00:56:15,990
benefits on station that can occur we

1555
00:56:19,460 --> 00:56:17,460
may find there's some medical things

1556
00:56:20,870 --> 00:56:19,470
that are better investigated in space

1557
00:56:23,030 --> 00:56:20,880
than they are on the ground that may

1558
00:56:24,380 --> 00:56:23,040
spawn off a commercial market for some

1559
00:56:24,990 --> 00:56:24,390
of those medical things and might be

1560
00:56:27,090 --> 00:56:25,000
another

1561
00:56:29,100 --> 00:56:27,100
Space Station dedicated that particular

1562
00:56:31,410 --> 00:56:29,110
activity so we need to see this

1563
00:56:33,660 --> 00:56:31,420

transition of where it was predominantly

1564
00:56:35,280 --> 00:56:33,670
a government activity to now where we'll

1565
00:56:36,270 --> 00:56:35,290
be maybe some more commercial activities

1566
00:56:38,760 --> 00:56:36,280
are starting to see that a little bit

1567
00:56:40,620 --> 00:56:38,770
with the cargo resupply of station we'll

1568
00:56:42,600 --> 00:56:40,630
see how those new cargo resupply

1569
00:56:44,400 --> 00:56:42,610
companies online come online this year

1570
00:56:46,590 --> 00:56:44,410
they're going to do their demonstration

1571
00:56:48,450 --> 00:56:46,600
flights this fall and then start more

1572
00:56:50,850 --> 00:56:48,460
regular service next year that's going

1573
00:56:52,650 --> 00:56:50,860
to be a huge challenge for them as we

1574
00:56:54,960 --> 00:56:52,660
know how difficult it is to operate

1575
00:56:56,280 --> 00:56:54,970
spacecraft and launch vehicles it'll be

1576
00:56:58,170 --> 00:56:56,290
interesting to see how they step up to

1577
00:57:00,000 --> 00:56:58,180
that that's another opportunity for

1578
00:57:01,650 --> 00:57:00,010
students and kids to get involved in

1579
00:57:04,290 --> 00:57:01,660
that activity and then Commercial Crew

1580
00:57:06,120 --> 00:57:04,300
may come along online it won't be too

1581
00:57:08,910 --> 00:57:06,130
long until we've got we've got the Orion

1582
00:57:11,520 --> 00:57:08,920
capsule or Orion MPCV multi-purpose crew

1583
00:57:12,960 --> 00:57:11,530
vehicle started so we're off working in

1584
00:57:14,790 --> 00:57:12,970
that activity so we can get some

1585
00:57:16,890 --> 00:57:14,800
students involved in that too so I think

1586
00:57:19,470 --> 00:57:16,900
we need to take advantage of this period

1587
00:57:21,540 --> 00:57:19,480
and don't let the momentum that we have

1588
00:57:23,850 --> 00:57:21,550

right now fall behind and did just fall

1589
00:57:25,890 --> 00:57:23,860
back on our heels and just sit back and

1590
00:57:27,660 --> 00:57:25,900
lament about what we had we need to be

1591
00:57:29,850 --> 00:57:27,670
looking forward about what the future is

1592
00:57:31,260 --> 00:57:29,860
and driving for that future are our

1593
00:57:33,930 --> 00:57:31,270
politicians are not going to support

1594
00:57:36,060 --> 00:57:33,940
that future if we the space community

1595
00:57:37,770 --> 00:57:36,070
zealots don't be push don't push for

1596
00:57:40,230 --> 00:57:37,780
that future there's no way we can expect

1597
00:57:41,880 --> 00:57:40,240
a politicians to step up and give us a

1598
00:57:44,130 --> 00:57:41,890
future in point us in the direction we

1599
00:57:46,380 --> 00:57:44,140
need to stay united keep moving forward

1600
00:57:50,690 --> 00:57:46,390
and show folks why we work so hard for

1601
00:57:54,450 --> 00:57:50,700
what we do every day here mike and mike

1602
00:57:56,400 --> 00:57:54,460
you said great all right well said thank

1603
00:57:58,080 --> 00:57:56,410
you very much when i invite you to tune

1604
00:58:00,780 --> 00:57:58,090
into and ask the television on thursday

1605
00:58:02,850 --> 00:58:00,790
for a full day's worth of sts-135

1606
00:58:05,640 --> 00:58:02,860
pre-flight briefings beginning at nine

1607
00:58:07,680 --> 00:58:05,650
a.m. eastern time on july 4th the

1608
00:58:09,270 --> 00:58:07,690
commander Chris Ferguson and his crew

1609
00:58:11,910 --> 00:58:09,280
arrives here at Kennedy Space Center at

1610
00:58:14,670 --> 00:58:11,920
2 45 p.m. that also will be carried live

1611
00:58:16,830 --> 00:58:14,680
on NASA television and again launch now

1612
00:58:19,380 --> 00:58:16,840
officially set for july eight eleven

1613
00:58:21,450 --> 00:58:19,390

twenty six a.m. eastern time you can

1614
00:58:25,710 --> 00:58:21,460
keep track of sts-135 and all the