
enter

1
00:00:05,829 --> 00:00:03,830
good afternoon and welcome to today's

2
00:00:06,950 --> 00:00:05,839
international space station program

3
00:00:09,030 --> 00:00:06,960
briefing where we're going to bring you

4
00:00:11,030 --> 00:00:09,040
up to date with the plans for upcoming

5
00:00:13,030 --> 00:00:11,040
spacewalks aboard the international

6
00:00:14,709 --> 00:00:13,040
space station with us today we have

7
00:00:17,029 --> 00:00:14,719
international space station program

8
00:00:19,189 --> 00:00:17,039
manager mike safradini and courtney

9
00:00:21,189 --> 00:00:19,199
mcmillan the lead flight director who'll

10
00:00:22,470 --> 00:00:21,199
be handling the spacewalks as they

11
00:00:23,509 --> 00:00:22,480
progress we'll start off with some

12
00:00:24,790 --> 00:00:23,519
comments

13
00:00:26,790 --> 00:00:24,800

from mike and courtney and then we'll

14
00:00:28,310 --> 00:00:26,800
move on to your questions mike

15
00:00:30,870 --> 00:00:28,320
good afternoon

16
00:00:34,069 --> 00:00:30,880
saturday afternoon later in the

17
00:00:36,389 --> 00:00:34,079
afternoon central time we lost one of

18
00:00:38,470 --> 00:00:36,399
our external active thermal control

19
00:00:41,510 --> 00:00:38,480
cooling loop pumps

20
00:00:43,350 --> 00:00:41,520
we refer to them as pms or pump modules

21
00:00:46,229 --> 00:00:43,360
this was the pump that's on the

22
00:00:48,790 --> 00:00:46,239
starboard truss s1 truss

23
00:00:52,150 --> 00:00:48,800
that flew up to the iss was installed

24
00:00:53,510 --> 00:00:52,160
back in october 2002

25
00:00:56,389 --> 00:00:53,520
at that point

26
00:00:59,110 --> 00:00:56,399
we activated the pump but did not drive

27
00:01:00,869 --> 00:00:59,120
the motor to start pumping the ammonia

28
00:01:03,430 --> 00:01:00,879
as you might recall that was the early

29
00:01:04,869 --> 00:01:03,440
phase of the assembly of the iss and we

30
00:01:06,870 --> 00:01:04,879
weren't ready

31
00:01:10,230 --> 00:01:06,880
to flow the ammonia to do the cooling of

32
00:01:13,350 --> 00:01:10,240
the bigger power systems until later

33
00:01:16,230 --> 00:01:13,360
and in fact in uh in the december 2006

34
00:01:17,190 --> 00:01:16,240
time play time frame we flew the 128.1

35
00:01:20,390 --> 00:01:17,200
mission

36
00:01:22,870 --> 00:01:20,400
at that time was that was when we

37
00:01:24,390 --> 00:01:22,880
actually configured the power system and

38
00:01:26,789 --> 00:01:24,400

activated the cooling system at that

39
00:01:28,710 --> 00:01:26,799
point we started driving these pumps

40
00:01:31,749 --> 00:01:28,720
and and all that's important information

41
00:01:33,749 --> 00:01:31,759
because uh as we do our failure analysis

42
00:01:34,870 --> 00:01:33,759
it's that's about the operational time

43
00:01:37,429 --> 00:01:34,880
on orbit

44
00:01:39,030 --> 00:01:37,439
uh that that helps us decide mean time

45
00:01:41,910 --> 00:01:39,040
between failure and see if this failure

46
00:01:43,830 --> 00:01:41,920
has any effect on that

47
00:01:46,069 --> 00:01:43,840
as a result of that anomaly the ops team

48
00:01:48,469 --> 00:01:46,079
did a fabulous job of

49
00:01:50,789 --> 00:01:48,479
reconfiguring the vehicle shedding loads

50
00:01:52,789 --> 00:01:50,799
off of that that thermal system

51
00:01:56,310 --> 00:01:52,799
and either powering off

52
00:01:58,149 --> 00:01:56,320
systems or or transferring the load to

53
00:02:00,389 --> 00:01:58,159
uh to the other

54
00:02:02,149 --> 00:02:00,399
power strings that were cooled by the

55
00:02:04,550 --> 00:02:02,159
the b pump

56
00:02:07,030 --> 00:02:04,560
on the port side of the vehicle

57
00:02:09,830 --> 00:02:07,040
so you probably heard during that period

58
00:02:11,990 --> 00:02:09,840
that we shut down two cmgs we shut down

59
00:02:15,430 --> 00:02:12,000
a gps system

60
00:02:17,350 --> 00:02:15,440
we shut down s-band stream one uh a

61
00:02:20,830 --> 00:02:17,360
number of mdms were powered down at the

62
00:02:22,550 --> 00:02:20,840
time and and many heaters were also

63
00:02:25,030 --> 00:02:22,560

deactivated

64
00:02:27,350 --> 00:02:25,040
once the configuration was stable then

65
00:02:29,430 --> 00:02:27,360
the ops team did attempt

66
00:02:33,110 --> 00:02:29,440
to reactivate the pump

67
00:02:35,270 --> 00:02:33,120
um in the the possible event that it was

68
00:02:36,470 --> 00:02:35,280
a some sort of radiation hit or

69
00:02:38,309 --> 00:02:36,480
momentary

70
00:02:39,670 --> 00:02:38,319
hit in the system and we did try to

71
00:02:41,589 --> 00:02:39,680
power it up

72
00:02:44,150 --> 00:02:41,599
and the circuit breaker breaker tripped

73
00:02:46,869 --> 00:02:44,160
again right as we sent the command to

74
00:02:49,990 --> 00:02:46,879
bring the rpms up

75
00:02:51,670 --> 00:02:50,000
the data suggests that the the motor and

76
00:02:53,990 --> 00:02:51,680
impeller are not frozen in fact the

77
00:02:54,869 --> 00:02:54,000
motor did start to to pump some of the

78
00:02:57,110 --> 00:02:54,879
uh

79
00:02:58,949 --> 00:02:57,120
of the ammonia when we when we tried to

80
00:03:01,030 --> 00:02:58,959
start it the second time

81
00:03:03,030 --> 00:03:01,040
uh so this tells us that there's a short

82
00:03:04,630 --> 00:03:03,040
somewhere in the power and the power

83
00:03:06,790 --> 00:03:04,640
feed to the motor

84
00:03:08,790 --> 00:03:06,800
between the controller and the motor

85
00:03:11,589 --> 00:03:08,800
all of that is encapsulated in what we

86
00:03:13,990 --> 00:03:11,599
call the pump modules very large oru on

87
00:03:16,710 --> 00:03:14,000
the truss that we will now have to

88
00:03:21,030 --> 00:03:18,550

after we finished that effort and the

89
00:03:22,390 --> 00:03:21,040
team got a chance to see that the the

90
00:03:25,030 --> 00:03:22,400
the loads

91
00:03:26,949 --> 00:03:25,040
and the heat on the the ddcu's that were

92
00:03:29,509 --> 00:03:26,959
not being cooled

93
00:03:31,589 --> 00:03:29,519
uh were lower than we expected we slowly

94
00:03:33,589 --> 00:03:31,599
over time have activated some of the

95
00:03:36,309 --> 00:03:33,599
other oru's we powered off

96
00:03:40,229 --> 00:03:36,319
we we only have one cmg powered off at

97
00:03:42,390 --> 00:03:40,239
this time all but one mdm is up

98
00:03:43,670 --> 00:03:42,400
both the s-band strings are available

99
00:03:44,949 --> 00:03:43,680
for use

100
00:03:46,550 --> 00:03:44,959
we still have a number of heaters

101
00:03:47,830 --> 00:03:46,560
powered off but they're available if we

102
00:03:51,190 --> 00:03:47,840
need them so

103
00:03:52,149 --> 00:03:51,200
our the the position we're in today is

104
00:03:54,390 --> 00:03:52,159
uh

105
00:03:56,390 --> 00:03:54,400
actually fairly close to nominal

106
00:03:57,910 --> 00:03:56,400
uh relative to the systems that that we

107
00:04:00,149 --> 00:03:57,920
have up

108
00:04:01,750 --> 00:04:00,159
of course some of our payload racks did

109
00:04:02,710 --> 00:04:01,760
have to get powered off

110
00:04:04,869 --> 00:04:02,720
um

111
00:04:07,110 --> 00:04:04,879
many of them are on we did we did have

112
00:04:08,309 --> 00:04:07,120
to turn off one of our our freezers

113
00:04:10,149 --> 00:04:08,319

which have

114
00:04:11,830 --> 00:04:10,159
specimens in that we have to bring home

115
00:04:13,190 --> 00:04:11,840
but before we powered

116
00:04:15,190 --> 00:04:13,200
that one off we transferred all the

117
00:04:17,509 --> 00:04:15,200
specimens into one of the melfi freezers

118
00:04:20,469 --> 00:04:17,519
and that one has been provided power

119
00:04:22,150 --> 00:04:20,479
for the for almost the entire time

120
00:04:23,670 --> 00:04:22,160
it was i think it was off for a short

121
00:04:26,150 --> 00:04:23,680
period of time but

122
00:04:27,430 --> 00:04:26,160
it has about an eight hour limit and so

123
00:04:29,510 --> 00:04:27,440
we never

124
00:04:31,990 --> 00:04:29,520
approached that so all the specimens on

125
00:04:35,110 --> 00:04:32,000
board have been protected

126
00:04:37,749 --> 00:04:35,120
since the next failure

127
00:04:40,469 --> 00:04:37,759
of a pump module would be a relatively

128
00:04:43,749 --> 00:04:40,479
significant challenge for the program

129
00:04:45,749 --> 00:04:43,759
we asked the team to uh redirect the eva

130
00:04:48,469 --> 00:04:45,759
planned on thursday to do the pump

131
00:04:50,710 --> 00:04:48,479
module r r we have four spares

132
00:04:52,629 --> 00:04:50,720
on orbit pre-positioned today in fact

133
00:04:54,550 --> 00:04:52,639
those are all the spares

134
00:04:56,469 --> 00:04:54,560
that the program has and this is part of

135
00:04:58,390 --> 00:04:56,479
the process we've

136
00:05:00,390 --> 00:04:58,400
implemented over the last several years

137
00:05:02,469 --> 00:05:00,400
to try to pre-position as many of these

138
00:05:03,830 --> 00:05:02,479

large orus as we can before the shuttle

139
00:05:05,189 --> 00:05:03,840
stands down

140
00:05:06,230 --> 00:05:05,199
and though it's not really pertinent to

141
00:05:08,150 --> 00:05:06,240
this

142
00:05:09,670 --> 00:05:08,160
particular anomaly we've gotten enough

143
00:05:12,469 --> 00:05:09,680
questions that i'll also tell you that

144
00:05:14,710 --> 00:05:12,479
these pump modules can fly on on either

145
00:05:17,110 --> 00:05:14,720
the hdv or the spacex vehicle if we

146
00:05:18,550 --> 00:05:17,120
needed to uh to fly one again all of our

147
00:05:22,790 --> 00:05:18,560
spares that we had planned to build for

148
00:05:24,950 --> 00:05:22,800
the program have been flown in on orbit

149
00:05:26,390 --> 00:05:24,960
so courtney and her team have

150
00:05:28,629 --> 00:05:26,400
been working hard and she'll tell you

151
00:05:30,390 --> 00:05:28,639
all about uh what they've done to get

152
00:05:32,390 --> 00:05:30,400
ready for this eva

153
00:05:34,230 --> 00:05:32,400
but they do think they can be ready by

154
00:05:35,830 --> 00:05:34,240
thursday so that's a dramatic change to

155
00:05:38,150 --> 00:05:35,840
eva but they still think they can get it

156
00:05:40,550 --> 00:05:38,160
done in time for a thursday for the

157
00:05:43,270 --> 00:05:40,560
first uh eva day and this is a be a

158
00:05:45,350 --> 00:05:43,280
two-day eva so the second eba day would

159
00:05:47,510 --> 00:05:45,360
be sunday

160
00:05:49,510 --> 00:05:47,520
i did talk to the the crew this morning

161
00:05:50,710 --> 00:05:49,520
and and as courtney said she just

162
00:05:52,629 --> 00:05:50,720
finished talking to him as well they're

163
00:05:54,070 --> 00:05:52,639

in great spirits already do this eva

164
00:05:56,070 --> 00:05:54,080
they had actually about a year ago

165
00:05:59,189 --> 00:05:56,080
trained this is what we call one of the

166
00:06:01,350 --> 00:05:59,199
big 14 evas which to date we hadn't had

167
00:06:03,749 --> 00:06:01,360
to do yet

168
00:06:06,710 --> 00:06:03,759
and it's a big 14 refers to some of the

169
00:06:08,309 --> 00:06:06,720
major oru's that an increment crew might

170
00:06:09,430 --> 00:06:08,319
have to do without the shuttle vehicle

171
00:06:10,870 --> 00:06:09,440
there so we

172
00:06:12,790 --> 00:06:10,880
some of the crew we don't train them all

173
00:06:15,350 --> 00:06:12,800
the crews trained generically for

174
00:06:17,350 --> 00:06:15,360
maintenance and then trained for some of

175
00:06:18,550 --> 00:06:17,360
the big 14 and this particular one the

176
00:06:20,150 --> 00:06:18,560
crews

177
00:06:22,710 --> 00:06:20,160
did train for so they have some

178
00:06:25,590 --> 00:06:22,720
familiarity with the with the tasks that

179
00:06:28,230 --> 00:06:25,600
is being asked of them

180
00:06:29,590 --> 00:06:28,240
um the ops and engineering teams because

181
00:06:30,950 --> 00:06:29,600
of the fact that we're down to one

182
00:06:32,629 --> 00:06:30,960
cooling pump we've got the ops and

183
00:06:34,790 --> 00:06:32,639
engineering teams now full up for

184
00:06:36,469 --> 00:06:34,800
24-hour support looks more like a

185
00:06:38,150 --> 00:06:36,479
shuttle flight over in the control

186
00:06:38,950 --> 00:06:38,160
center if you go over there

187
00:06:46,870 --> 00:06:38,960
and

188
00:06:48,710 --> 00:06:46,880

i do i do need to say that we spare the

189
00:06:51,110 --> 00:06:48,720
vehicle and we train the crews and the

190
00:06:54,070 --> 00:06:51,120
teams for these kinds of anomalies

191
00:06:55,589 --> 00:06:54,080
we have been been very fortunate in in

192
00:06:57,029 --> 00:06:55,599
our lives to not have to deal with too

193
00:06:58,950 --> 00:06:57,039
many

194
00:07:00,710 --> 00:06:58,960
real significant anomalies such as this

195
00:07:02,870 --> 00:07:00,720
particular pump module

196
00:07:04,390 --> 00:07:02,880
but the team is ready to go and as

197
00:07:06,550 --> 00:07:04,400
courtney they'll tell you

198
00:07:07,430 --> 00:07:06,560
we've got we've got good plans in place

199
00:07:11,830 --> 00:07:07,440
and

200
00:07:13,510 --> 00:07:11,840
on more to a nominal

201
00:07:15,430 --> 00:07:13,520
research planning which of course is

202
00:07:17,110 --> 00:07:15,440
probably the biggest hit to the program

203
00:07:18,710 --> 00:07:17,120
to date would be the amount of research

204
00:07:20,629 --> 00:07:18,720
we're able to do for the next next

205
00:07:21,990 --> 00:07:20,639
several days so with that i'll hand it

206
00:07:24,070 --> 00:07:22,000
over to lead flight director courtney

207
00:07:26,710 --> 00:07:24,080
mcmillan

208
00:07:29,909 --> 00:07:26,720
all right good afternoon so as as mike

209
00:07:32,710 --> 00:07:29,919
said we had an eba planned for thursday

210
00:07:34,629 --> 00:07:32,720
that had a completely different timeline

211
00:07:36,550 --> 00:07:34,639
we went ahead and started working

212
00:07:38,710 --> 00:07:36,560
options to see if we could get the pump

213
00:07:40,309 --> 00:07:38,720

module r r started

214
00:07:42,070 --> 00:07:40,319
on this thursday

215
00:07:44,230 --> 00:07:42,080
and we are still in the process of doing

216
00:07:45,189 --> 00:07:44,240
that we have crew members in the nbl

217
00:07:47,909 --> 00:07:45,199
today

218
00:07:49,110 --> 00:07:47,919
doing what we call a development run

219
00:07:50,469 --> 00:07:49,120
to

220
00:07:52,950 --> 00:07:50,479
see if we can and we're getting some

221
00:07:53,990 --> 00:07:52,960
video now direct this is live from the

222
00:07:56,230 --> 00:07:54,000
mbl

223
00:07:57,350 --> 00:07:56,240
this is katie coleman and suni williams

224
00:07:59,110 --> 00:07:57,360
in the pool

225
00:08:02,469 --> 00:07:59,120
and they are doing some of the tasks

226
00:08:04,070 --> 00:08:02,479
that we foresee on these two evas we're

227
00:08:05,110 --> 00:08:04,080
trying to work out the details of the

228
00:08:07,350 --> 00:08:05,120
timeline

229
00:08:09,350 --> 00:08:07,360
and uh based on how this run goes today

230
00:08:11,510 --> 00:08:09,360
we'll be able to decide if we're really

231
00:08:13,110 --> 00:08:11,520
going to be ready for thursday for sure

232
00:08:14,309 --> 00:08:13,120
if we're going to need another day or so

233
00:08:16,070 --> 00:08:14,319
to polish

234
00:08:17,670 --> 00:08:16,080
some of the some of the constraints that

235
00:08:20,150 --> 00:08:17,680
were that we're working with and some of

236
00:08:21,510 --> 00:08:20,160
the steps we're going to need to do

237
00:08:22,950 --> 00:08:21,520
all right let's see let's go to the

238
00:08:24,950 --> 00:08:22,960

first graphic and i'll show you what

239
00:08:27,110 --> 00:08:24,960
we're talking about today so ignore the

240
00:08:29,589 --> 00:08:27,120
array on the top of the truss this is an

241
00:08:31,909 --> 00:08:29,599
old configuration but the yellow box

242
00:08:33,829 --> 00:08:31,919
there is the s1 pump module and where

243
00:08:35,670 --> 00:08:33,839
it's located this is the one that is in

244
00:08:38,310 --> 00:08:35,680
the system and that's failed currently

245
00:08:40,550 --> 00:08:38,320
and let's go to the next graphic

246
00:08:43,269 --> 00:08:40,560
this is a closer shot of that and you

247
00:08:45,269 --> 00:08:43,279
can see the oru is pretty big it's uh i

248
00:08:47,350 --> 00:08:45,279
think it weighs about 500 pounds we can

249
00:08:49,910 --> 00:08:47,360
get the exact number for you guys later

250
00:08:51,590 --> 00:08:49,920
on next slide

251
00:08:53,990 --> 00:08:51,600
this is the location of the spare we're

252
00:08:56,310 --> 00:08:54,000
going to be using on esp-2 which is on

253
00:08:58,389 --> 00:08:56,320
the other side of the truss basically so

254
00:08:59,430 --> 00:08:58,399
and and down below as opposed to up on

255
00:09:00,790 --> 00:08:59,440
the face

256
00:09:02,470 --> 00:09:00,800
so the crew has a fair amount of

257
00:09:05,190 --> 00:09:02,480
translation to do

258
00:09:07,190 --> 00:09:05,200
during this eva next slide

259
00:09:22,150 --> 00:09:07,200
this is a closer shot of the pump module

260
00:09:26,389 --> 00:09:23,910
for generic training for the crew as

261
00:09:29,030 --> 00:09:26,399
part of the big 14 training assumes that

262
00:09:30,710 --> 00:09:29,040
we do not have access to be able to use

263
00:09:33,030 --> 00:09:30,720

the robotic arm

264
00:09:34,389 --> 00:09:33,040
because of the loss of power redundancy

265
00:09:37,110 --> 00:09:34,399
on the external

266
00:09:39,030 --> 00:09:37,120
orus so we are essentially right now

267
00:09:39,990 --> 00:09:39,040
running single string on the robotic

268
00:09:41,670 --> 00:09:40,000
system

269
00:09:43,750 --> 00:09:41,680
we are in the process of doing some

270
00:09:46,150 --> 00:09:43,760
testing and analysis to see if we can

271
00:09:49,110 --> 00:09:46,160
get enough redundancy on the arm

272
00:09:51,350 --> 00:09:49,120
to be able to use the arm

273
00:09:52,870 --> 00:09:51,360
even if we have a failure for the full

274
00:09:54,949 --> 00:09:52,880
spacewalk

275
00:09:56,550 --> 00:09:54,959
we do have we know for sure we have

276
00:09:58,470 --> 00:09:56,560
enough capacity

277
00:10:00,870 --> 00:09:58,480
on the redundant power string to be able

278
00:10:02,630 --> 00:10:00,880
to use the arm if we needed to fail over

279
00:10:05,430 --> 00:10:02,640
and get the crew to safety while they're

280
00:10:08,069 --> 00:10:05,440
off of structure so we do plan to use

281
00:10:09,829 --> 00:10:08,079
the arm for the eva it will be in a safe

282
00:10:11,829 --> 00:10:09,839
configuration and it's really just we

283
00:10:13,990 --> 00:10:11,839
need to determine if we have enough

284
00:10:16,230 --> 00:10:14,000
margin on the on the arm on the power

285
00:10:17,910 --> 00:10:16,240
system to be able to use the eva in the

286
00:10:19,590 --> 00:10:17,920
backup configuration through the whole

287
00:10:21,750 --> 00:10:19,600
eva or just

288
00:10:23,590 --> 00:10:21,760

just to get the crew member to safety

289
00:10:26,230 --> 00:10:23,600
there are a lot of technical challenges

290
00:10:28,790 --> 00:10:26,240
as we've said with the cva

291
00:10:31,430 --> 00:10:28,800
with these evas it is a minimum of two

292
00:10:33,190 --> 00:10:31,440
evas to get the job done the first eva

293
00:10:34,310 --> 00:10:33,200
the focus will be on getting the failed

294
00:10:36,310 --> 00:10:34,320
unit out

295
00:10:39,030 --> 00:10:36,320
we hope to be able to prepare the spare

296
00:10:40,069 --> 00:10:39,040
unit for installation on the first eva

297
00:10:42,710 --> 00:10:40,079
as well

298
00:10:45,350 --> 00:10:42,720
but that is entirely dependent on how

299
00:10:47,509 --> 00:10:45,360
the timeline flows with some of the

300
00:10:49,829 --> 00:10:47,519
challenging parts of preparing the

301
00:10:52,230 --> 00:10:49,839
failed unit to be released

302
00:10:54,949 --> 00:10:52,240
the most challenging in there is the the

303
00:10:57,030 --> 00:10:54,959
ammonia quick disconnect

304
00:10:58,550 --> 00:10:57,040
connections that the crew is going to

305
00:11:00,870 --> 00:10:58,560
have to release

306
00:11:02,949 --> 00:11:00,880
since the external loop uses ammonia as

307
00:11:04,710 --> 00:11:02,959
the cooling fluid

308
00:11:06,790 --> 00:11:04,720
all of the lines are pressurized with

309
00:11:08,550 --> 00:11:06,800
ammonia and have to be released by the

310
00:11:10,630 --> 00:11:08,560
crew during the eva we've done this

311
00:11:12,069 --> 00:11:10,640
before for different parts of the

312
00:11:13,750 --> 00:11:12,079
thermal system

313
00:11:15,430 --> 00:11:13,760

and the crew is very well trained on how

314
00:11:17,269 --> 00:11:15,440
to do decontamination if they get

315
00:11:18,710 --> 00:11:17,279
ammonia on them during the during the

316
00:11:21,269 --> 00:11:18,720
procedures

317
00:11:22,550 --> 00:11:21,279
but it presents a timeline challenge to

318
00:11:24,949 --> 00:11:22,560
make sure we have enough room in the

319
00:11:27,269 --> 00:11:24,959
timeline to account for that

320
00:11:29,269 --> 00:11:27,279
i already talked about the the power

321
00:11:31,269 --> 00:11:29,279
challenges that's that's not just for

322
00:11:34,230 --> 00:11:31,279
the arm but also for the preparation for

323
00:11:36,069 --> 00:11:34,240
eva systems required as well

324
00:11:38,389 --> 00:11:36,079
there are some timeline challenges we're

325
00:11:40,710 --> 00:11:38,399
putting together like i said the robotic

326
00:11:42,630 --> 00:11:40,720
portion of the eva shannon will be

327
00:11:43,750 --> 00:11:42,640
running the arm while tracy and doug are

328
00:11:45,269 --> 00:11:43,760
outside

329
00:11:47,829 --> 00:11:45,279
and we are pulling those procedures

330
00:11:51,269 --> 00:11:47,839
together as well so folks are working

331
00:11:54,230 --> 00:11:51,279
hot and heavy to get everything ready

332
00:11:56,150 --> 00:11:54,240
for big 14 failures in general we we

333
00:12:00,550 --> 00:11:56,160
typically

334
00:12:02,790 --> 00:12:00,560
to prepare for one of these evas

335
00:12:04,230 --> 00:12:02,800
since we had an eva coming up we decided

336
00:12:06,069 --> 00:12:04,240
to take advantage of the fact that the

337
00:12:08,150 --> 00:12:06,079
crew already has the airlock and all the

338
00:12:09,910 --> 00:12:08,160

suit systems all ready to go

339
00:12:12,150 --> 00:12:09,920
but this is a very aggressive timeline

340
00:12:13,750 --> 00:12:12,160
for us to get the procedures ready folks

341
00:12:14,629 --> 00:12:13,760
are working around the clock as mike

342
00:12:16,150 --> 00:12:14,639
said

343
00:12:18,069 --> 00:12:16,160
and doing an amazing job getting

344
00:12:20,710 --> 00:12:18,079
everything we need so that so that we

345
00:12:23,670 --> 00:12:20,720
can be ready to go

346
00:12:25,829 --> 00:12:23,680
and let's see we've got another nbl run

347
00:12:27,509 --> 00:12:25,839
either tomorrow if we decide we're in

348
00:12:29,670 --> 00:12:27,519
good shape to press for thursday or

349
00:12:31,430 --> 00:12:29,680
we'll slide that second nbl run one more

350
00:12:33,190 --> 00:12:31,440
day if we need to to

351
00:12:34,230 --> 00:12:33,200
get some additional time to polish the

352
00:12:35,829 --> 00:12:34,240
timeline

353
00:12:38,150 --> 00:12:35,839
and then that will be the final run

354
00:12:41,190 --> 00:12:38,160
prior to the first cva if we need to we

355
00:12:43,269 --> 00:12:41,200
will do another run after the first eva

356
00:12:44,949 --> 00:12:43,279
and before the second one just to clean

357
00:12:46,069 --> 00:12:44,959
up the whole config and make sure we're

358
00:12:47,670 --> 00:12:46,079
good to go

359
00:12:50,069 --> 00:12:47,680
and i think that's all i've got for

360
00:12:51,670 --> 00:12:50,079
general briefing okay thanks we'll start

361
00:12:53,350 --> 00:12:51,680
out with questions here at the johnson

362
00:12:54,389 --> 00:12:53,360
space center in houston

363
00:12:55,590 --> 00:12:54,399

please remember your name and

364
00:12:57,509 --> 00:12:55,600
affiliation

365
00:12:59,990 --> 00:12:57,519
start in the back with mark

366
00:13:01,750 --> 00:13:00,000
hey thanks mark caro for aviation week

367
00:13:05,670 --> 00:13:01,760
in space technology

368
00:13:08,150 --> 00:13:05,680
had a couple questions and my first one

369
00:13:10,949 --> 00:13:08,160
deals with a sort of context for this

370
00:13:13,590 --> 00:13:10,959
and i i just wonder um

371
00:13:15,190 --> 00:13:13,600
how you consider this in terms of

372
00:13:16,870 --> 00:13:15,200
urgency

373
00:13:19,509 --> 00:13:16,880
obviously the preparations around the

374
00:13:21,509 --> 00:13:19,519
clock speak to that and the and the

375
00:13:22,389 --> 00:13:21,519
and the near term for the space walks

376
00:13:24,310 --> 00:13:22,399
but

377
00:13:26,230 --> 00:13:24,320
uh how do you sort of size up what this

378
00:13:28,470 --> 00:13:26,240
means to the space station

379
00:13:31,829 --> 00:13:28,480
in terms of its operability with six

380
00:13:34,790 --> 00:13:32,790
um

381
00:13:36,150 --> 00:13:34,800
well to some degree it's independent of

382
00:13:37,670 --> 00:13:36,160
the fact that there's six people on

383
00:13:39,269 --> 00:13:37,680
orbit there's a number of systems that

384
00:13:40,230 --> 00:13:39,279
need to be cooled

385
00:13:42,790 --> 00:13:40,240
um

386
00:13:44,550 --> 00:13:42,800
all of which uh well i should say all

387
00:13:47,350 --> 00:13:44,560
some of the power modules the power

388
00:13:49,829 --> 00:13:47,360

modules cool themselves out there at the

389
00:13:51,670 --> 00:13:49,839
end of the truss but the majority of the

390
00:13:52,710 --> 00:13:51,680
iss systems are cooled by these two

391
00:13:54,710 --> 00:13:52,720
loops

392
00:13:55,829 --> 00:13:54,720
so we have one loop down as courtney was

393
00:13:58,230 --> 00:13:55,839
telling you

394
00:14:01,350 --> 00:13:58,240
about the ssrms

395
00:14:05,189 --> 00:14:01,360
ops the ddcus that provide the majority

396
00:14:09,750 --> 00:14:07,430
they have some residual capability

397
00:14:11,910 --> 00:14:09,760
because they they manage not to overheat

398
00:14:12,870 --> 00:14:11,920
at lower loads so you we are getting

399
00:14:18,230 --> 00:14:12,880
some

400
00:14:21,110 --> 00:14:18,240
of them are

401
00:14:25,350 --> 00:14:21,120
so if we lose the next cooling system

402
00:14:29,110 --> 00:14:27,750
most of the components on board iss and

403
00:14:30,790 --> 00:14:29,120
so

404
00:14:32,710 --> 00:14:30,800
that would

405
00:14:34,790 --> 00:14:32,720
be a significant challenge to the team

406
00:14:36,150 --> 00:14:34,800
to to work through that

407
00:14:37,990 --> 00:14:36,160
in order to work through that you'd have

408
00:14:39,670 --> 00:14:38,000
to get the crew out to go do eba and

409
00:14:41,670 --> 00:14:39,680
change out whatever component need to be

410
00:14:43,430 --> 00:14:41,680
changed out

411
00:14:45,189 --> 00:14:43,440
so the team just assumed not be in that

412
00:14:46,470 --> 00:14:45,199
position and so that's why we've asked

413
00:14:48,470 --> 00:14:46,480

the team to

414
00:14:50,069 --> 00:14:48,480
to take

415
00:14:52,710 --> 00:14:50,079
all haste to try to get this particular

416
00:14:54,470 --> 00:14:52,720
eba done so that we can

417
00:14:56,389 --> 00:14:54,480
put ourselves back in a redundancy

418
00:14:58,790 --> 00:14:56,399
position that gives us more time to

419
00:15:01,189 --> 00:14:58,800
react to the next failure so really from

420
00:15:03,269 --> 00:15:01,199
an iss perspective today we're in fine

421
00:15:04,870 --> 00:15:03,279
shape

422
00:15:06,470 --> 00:15:04,880
the the we're just trying to make sure

423
00:15:08,870 --> 00:15:06,480
we get the eva done before we suffer the

424
00:15:10,470 --> 00:15:08,880
next failure in that system

425
00:15:11,910 --> 00:15:10,480
which is while very unlikely is

426
00:15:13,350 --> 00:15:11,920
something we ought to do as a program to

427
00:15:15,509 --> 00:15:13,360
make sure we give ourselves best chance

428
00:15:16,710 --> 00:15:15,519
of success

429
00:15:18,230 --> 00:15:16,720
thank you i had a second question i

430
00:15:20,550 --> 00:15:18,240
believe you touched on this about the

431
00:15:22,949 --> 00:15:20,560
number of these pump modules

432
00:15:24,550 --> 00:15:22,959
and i think you said four but i wasn't

433
00:15:26,949 --> 00:15:24,560
sure whether you meant the two that are

434
00:15:30,629 --> 00:15:26,959
operating plus two spares on the station

435
00:15:33,110 --> 00:15:30,639
or if you in fact have two operating

436
00:15:35,590 --> 00:15:33,120
and four spares yes we have two

437
00:15:37,749 --> 00:15:35,600
operating and four spares and can you

438
00:15:41,990 --> 00:15:37,759

can you say where those are where the

439
00:15:45,749 --> 00:15:42,000
spares are located i can esp2 esp3 elc1

440
00:15:46,710 --> 00:15:45,759
and elc2 all of those each have one

441
00:15:51,030 --> 00:15:46,720
pump

442
00:15:55,990 --> 00:15:53,990
eric berger with houston chronicle um so

443
00:15:57,430 --> 00:15:56,000
you're saying that the primary concern

444
00:15:59,749 --> 00:15:57,440
and this is on the assumption that the

445
00:16:01,829 --> 00:15:59,759
second module fails which obviously we

446
00:16:03,269 --> 00:16:01,839
talked about is unlikely

447
00:16:06,069 --> 00:16:03,279
that the primary concern would be the

448
00:16:07,590 --> 00:16:06,079
frying of these components or

449
00:16:09,749 --> 00:16:07,600
describe it how you will

450
00:16:12,150 --> 00:16:09,759
on the outside as opposed to the station

451
00:16:13,590 --> 00:16:12,160
overheating inside and being a concern

452
00:16:15,269 --> 00:16:13,600
for the safety of the astronauts i guess

453
00:16:17,189 --> 00:16:15,279
i'm just sort of trying to understand

454
00:16:18,870 --> 00:16:17,199
how bad of configuration you would be in

455
00:16:21,269 --> 00:16:18,880
if you lost the second one for a period

456
00:16:23,350 --> 00:16:21,279
of time okay

457
00:16:28,310 --> 00:16:23,360
the way the system works is we flow

458
00:16:30,470 --> 00:16:28,320
ammonia the ammonia flows to uh some

459
00:16:32,949 --> 00:16:30,480
through some components outside for

460
00:16:35,430 --> 00:16:32,959
cooling and it flows to a heat exchanger

461
00:16:37,110 --> 00:16:35,440
on the labs and the nodes

462
00:16:39,829 --> 00:16:37,120
that provide then

463
00:16:42,550 --> 00:16:39,839

cooling to a water loop that's inside

464
00:16:43,749 --> 00:16:42,560
and so everything that sits on a

465
00:16:45,749 --> 00:16:43,759
on a

466
00:16:47,749 --> 00:16:45,759
cold plate is

467
00:16:50,870 --> 00:16:47,759
inside is also cooled by this same

468
00:16:54,230 --> 00:16:50,880
ammonia system so all of the systems

469
00:16:55,509 --> 00:16:54,240
inside and outside and so therefore also

470
00:16:58,470 --> 00:16:55,519
i should say

471
00:17:00,150 --> 00:16:58,480
the aaa fans that that get their cooling

472
00:17:02,790 --> 00:17:00,160
that cool the air

473
00:17:05,110 --> 00:17:02,800
the the systems that get air cooled

474
00:17:07,270 --> 00:17:05,120
also get their cooling from

475
00:17:08,949 --> 00:17:07,280
this ammonia system indirectly through

476
00:17:11,429 --> 00:17:08,959
the water loop that flows through the

477
00:17:13,429 --> 00:17:11,439
inside of the space station so all of

478
00:17:15,270 --> 00:17:13,439
the systems other than some of the

479
00:17:16,789 --> 00:17:15,280
components out on the truss where the

480
00:17:19,029 --> 00:17:16,799
power modules are

481
00:17:20,870 --> 00:17:19,039
get their cooling from this this cooling

482
00:17:22,390 --> 00:17:20,880
system now you'd say well then you

483
00:17:23,590 --> 00:17:22,400
should be okay you have power the

484
00:17:25,189 --> 00:17:23,600
problem with that

485
00:17:26,630 --> 00:17:25,199
is the power comes in from the power

486
00:17:29,270 --> 00:17:26,640
modules and goes to four main

487
00:17:31,190 --> 00:17:29,280
distribution boxes called the mbsu's

488
00:17:33,270 --> 00:17:31,200

those get their cooling from

489
00:17:35,350 --> 00:17:33,280
this ammonia system and then those all

490
00:17:37,190 --> 00:17:35,360
flow to ddcus that get their cooling

491
00:17:38,789 --> 00:17:37,200
from the ammonia system and so on and so

492
00:17:41,750 --> 00:17:38,799
forth

493
00:17:44,310 --> 00:17:41,760
so without without these pumps without

494
00:17:46,310 --> 00:17:44,320
this ability to have ammonia

495
00:17:47,669 --> 00:17:46,320
cooling the system then we we get to the

496
00:17:49,110 --> 00:17:47,679
point where you have to start shutting

497
00:17:50,070 --> 00:17:49,120
things down

498
00:17:54,150 --> 00:17:50,080
um

499
00:17:56,390 --> 00:17:54,160
some components uh do have some

500
00:17:57,590 --> 00:17:56,400
radiative cooling that can occur but

501
00:17:59,190 --> 00:17:57,600
that's very

502
00:18:01,350 --> 00:17:59,200
minimal relative to the loads they're

503
00:18:03,110 --> 00:18:01,360
they're asked to carry

504
00:18:06,549 --> 00:18:03,120
and so that's uh

505
00:18:08,070 --> 00:18:06,559
that just puts us in a in a very real

506
00:18:09,750 --> 00:18:08,080
struggle to keep all the components

507
00:18:12,630 --> 00:18:09,760
working and the reason why i said it

508
00:18:14,710 --> 00:18:12,640
wasn't really crew independent there are

509
00:18:16,710 --> 00:18:14,720
eclipse type systems that that support

510
00:18:18,710 --> 00:18:16,720
the crew the oxygen generation co2

511
00:18:19,669 --> 00:18:18,720
removal water systems things of that

512
00:18:20,710 --> 00:18:19,679
nature

513
00:18:22,950 --> 00:18:20,720

um

514
00:18:24,870 --> 00:18:22,960
but if i if you lose all the rest of the

515
00:18:26,150 --> 00:18:24,880
systems then really you'd the life

516
00:18:28,390 --> 00:18:26,160
support is

517
00:18:30,710 --> 00:18:28,400
uh becomes uh just one of the many

518
00:18:32,950 --> 00:18:30,720
systems you lost and at that point you

519
00:18:35,669 --> 00:18:32,960
got to get the cooling system back

520
00:18:37,270 --> 00:18:35,679
uh so that you can can bring up all the

521
00:18:40,070 --> 00:18:37,280
systems including the life support

522
00:18:43,830 --> 00:18:41,990
that's why i said the way i did that

523
00:18:45,830 --> 00:18:43,840
makes sense that does make sense and i i

524
00:18:46,870 --> 00:18:45,840
guess would it be a concern so the crew

525
00:18:47,909 --> 00:18:46,880
short term i mean they're not going to

526
00:18:49,430 --> 00:18:47,919
be like

527
00:18:50,870 --> 00:18:49,440
burning up in there when they're in the

528
00:18:53,350 --> 00:18:50,880
in the face of the sun and then the

529
00:18:55,029 --> 00:18:53,360
second of all the components themselves

530
00:18:57,510 --> 00:18:55,039
most of them wouldn't be fried if they

531
00:18:59,029 --> 00:18:57,520
lost cooling for a couple a day or two

532
00:19:00,710 --> 00:18:59,039
oh you're asking so what happens if i

533
00:19:01,990 --> 00:19:00,720
lose the other system before is that

534
00:19:02,950 --> 00:19:02,000
what you okay

535
00:19:05,669 --> 00:19:02,960
um

536
00:19:06,630 --> 00:19:05,679
so so uh i can touch on pieces of that

537
00:19:08,390 --> 00:19:06,640
of course remember we have the whole

538
00:19:10,470 --> 00:19:08,400

russian segment it is independent of the

539
00:19:12,390 --> 00:19:10,480
u.s segment in terms of cooling and so

540
00:19:13,669 --> 00:19:12,400
we would hand over

541
00:19:16,390 --> 00:19:13,679
they can provide some of the life

542
00:19:19,270 --> 00:19:16,400
support functions already uh there most

543
00:19:20,710 --> 00:19:19,280
of their systems won't do six crew but

544
00:19:22,950 --> 00:19:20,720
they'll do a

545
00:19:24,710 --> 00:19:22,960
a subset of six crew and so that's be

546
00:19:26,470 --> 00:19:24,720
the first thing you do we'd hang as much

547
00:19:28,310 --> 00:19:26,480
as we could for life support on the

548
00:19:29,669 --> 00:19:28,320
russian segment the russian segment

549
00:19:31,029 --> 00:19:29,679
would have to take over control of the

550
00:19:32,950 --> 00:19:31,039
vehicle

551
00:19:35,669 --> 00:19:32,960
and that cost you about

552
00:19:37,750 --> 00:19:35,679
give or take 50 kilograms of prop a day

553
00:19:40,070 --> 00:19:37,760
to hold the stack

554
00:19:41,510 --> 00:19:40,080
in attitude and then we've got quite a

555
00:19:43,590 --> 00:19:41,520
bit of fuel on board so that's not a

556
00:19:45,029 --> 00:19:43,600
near-term issue we i think there's like

557
00:19:47,830 --> 00:19:45,039
100 days somebody said something like

558
00:19:49,430 --> 00:19:47,840
that so we got quite a few days of that

559
00:19:51,350 --> 00:19:49,440
the bigger challenge then is power

560
00:19:53,350 --> 00:19:51,360
enough of the power systems that you

561
00:19:55,430 --> 00:19:53,360
need to go ahead and do your eva and get

562
00:19:57,110 --> 00:19:55,440
outside you need calm

563
00:19:58,789 --> 00:19:57,120

you need power for some of the systems

564
00:20:01,270 --> 00:19:58,799
and things like that we've asked the

565
00:20:02,789 --> 00:20:01,280
team i say all this like i know exactly

566
00:20:04,470 --> 00:20:02,799
all the steps we do

567
00:20:07,830 --> 00:20:04,480
one of the things the team is off doing

568
00:20:10,070 --> 00:20:07,840
now is giving us that rundown what do we

569
00:20:12,549 --> 00:20:10,080
do if we do in fact have this next

570
00:20:14,230 --> 00:20:12,559
failure before we change out the pump so

571
00:20:15,510 --> 00:20:14,240
there's a there's a team that's been

572
00:20:17,669 --> 00:20:15,520
activated

573
00:20:19,270 --> 00:20:17,679
as of yesterday and and they're off

574
00:20:21,029 --> 00:20:19,280
trying to sort that all for us but i

575
00:20:23,669 --> 00:20:21,039
mean that's the reader's digest version

576
00:20:25,750 --> 00:20:23,679
we would put all the life support on the

577
00:20:27,830 --> 00:20:25,760
russian segment uh the russian segment

578
00:20:30,390 --> 00:20:27,840
would would uh struggle to provide for

579
00:20:32,390 --> 00:20:30,400
six but it could over several days

580
00:20:35,350 --> 00:20:32,400
and then we'd go get this particular eva

581
00:20:37,750 --> 00:20:35,360
behind us and get that pump back up

582
00:20:39,430 --> 00:20:37,760
and then we would slowly go through the

583
00:20:41,750 --> 00:20:39,440
next step of recovering the other pump

584
00:20:43,190 --> 00:20:41,760
whatever caused it it to fail now i have

585
00:20:44,789 --> 00:20:43,200
a reason believe it's going to fail or

586
00:20:46,470 --> 00:20:44,799
any of the other systems but that's just

587
00:20:49,510 --> 00:20:46,480
planning that we tried to do to protect

588
00:20:52,390 --> 00:20:51,350

more questions

589
00:20:54,390 --> 00:20:52,400
hi i'm robert roman with

590
00:20:55,669 --> 00:20:54,400
collectspace.com

591
00:20:57,590 --> 00:20:55,679
to start

592
00:21:00,070 --> 00:20:57,600
to work off somewhat of what mark asked

593
00:21:01,029 --> 00:21:00,080
about putting this into context where

594
00:21:03,190 --> 00:21:01,039
does this

595
00:21:05,590 --> 00:21:03,200
failure sit within the 10-year history

596
00:21:06,870 --> 00:21:05,600
of the iss with the problems as compared

597
00:21:08,470 --> 00:21:06,880
to like the problems you experienced

598
00:21:10,390 --> 00:21:08,480
with sarge the problem you experienced

599
00:21:13,190 --> 00:21:10,400
with the cmgs

600
00:21:15,669 --> 00:21:13,200
how critical is this uh compared to the

601
00:21:16,630 --> 00:21:15,679
other issues that the iss has faced

602
00:21:23,029 --> 00:21:16,640
it's

603
00:21:26,070 --> 00:21:23,039
an element of challenge to to the time

604
00:21:27,510 --> 00:21:26,080
frame to get the repair done

605
00:21:29,590 --> 00:21:27,520
sarge was

606
00:21:31,590 --> 00:21:29,600
though it was a significant issue for us

607
00:21:32,630 --> 00:21:31,600
at the time we were we always had plenty

608
00:21:34,710 --> 00:21:32,640
of power

609
00:21:36,710 --> 00:21:34,720
it occurred early in our life and so we

610
00:21:38,470 --> 00:21:36,720
didn't need to rotate the array and we

611
00:21:39,909 --> 00:21:38,480
knew that fairly soon now we were

612
00:21:41,590 --> 00:21:39,919
worried about the long term but there

613
00:21:43,909 --> 00:21:41,600

was an immediate

614
00:21:45,590 --> 00:21:43,919
challenge probably the other one that

615
00:21:48,310 --> 00:21:45,600
that rates right up here is the solar

616
00:21:51,190 --> 00:21:48,320
ray tear that occurred during uh

617
00:21:52,789 --> 00:21:51,200
10a we were trying to redeploy that one

618
00:21:53,990 --> 00:21:52,799
and that was only because it took us a

619
00:21:56,149 --> 00:21:54,000
little while to figure out if we thought

620
00:21:58,149 --> 00:21:56,159
we could repair it at all and

621
00:22:00,230 --> 00:21:58,159
and though we we acted very calm through

622
00:22:01,590 --> 00:22:00,240
that whole thing that one that that was

623
00:22:03,350 --> 00:22:01,600
a challenge for us

624
00:22:05,029 --> 00:22:03,360
so this one is not

625
00:22:06,230 --> 00:22:05,039
this is a this is and that was an

626
00:22:07,669 --> 00:22:06,240
unplanned one we

627
00:22:09,270 --> 00:22:07,679
really hadn't planned on tearing solar

628
00:22:10,630 --> 00:22:09,280
rays we didn't think it was it was one

629
00:22:11,669 --> 00:22:10,640
of those things we could do we thought

630
00:22:13,990 --> 00:22:11,679
there were other things that would occur

631
00:22:16,390 --> 00:22:14,000
before you you caught that to happen

632
00:22:18,390 --> 00:22:16,400
so this is a this is an anomaly we knew

633
00:22:20,310 --> 00:22:18,400
some day would happen it's an anomaly

634
00:22:22,630 --> 00:22:20,320
that we have trained for it's an anomaly

635
00:22:25,430 --> 00:22:22,640
that we have planned for

636
00:22:27,270 --> 00:22:25,440
uh it's uh obviously we've spared for it

637
00:22:29,909 --> 00:22:27,280
so i mean we're in a good position to go

638
00:22:33,190 --> 00:22:29,919

solve this problem it is a significant

639
00:22:35,750 --> 00:22:33,200
failure though in terms of of um

640
00:22:37,350 --> 00:22:35,760
systems on board iss and so it's one we

641
00:22:38,149 --> 00:22:37,360
need to go get after

642
00:22:40,549 --> 00:22:38,159
but

643
00:22:41,990 --> 00:22:40,559
you know it's not a

644
00:22:43,909 --> 00:22:42,000
you know it's not there's there's

645
00:22:45,830 --> 00:22:43,919
anomalies that are significant to you

646
00:22:47,510 --> 00:22:45,840
from as a system

647
00:22:49,029 --> 00:22:47,520
that you need to get to

648
00:22:50,470 --> 00:22:49,039
quickly and that's what this one is

649
00:22:52,070 --> 00:22:50,480
there are anomalies sometimes it occur

650
00:22:53,190 --> 00:22:52,080
that you hadn't planned on and then it

651
00:22:55,270 --> 00:22:53,200
takes you a while to figure out how

652
00:22:57,190 --> 00:22:55,280
you're going to go solve it but that's

653
00:22:59,029 --> 00:22:57,200
not the kind we're dealing with here so

654
00:23:01,029 --> 00:22:59,039
we're actually in great shape to have as

655
00:23:02,950 --> 00:23:01,039
courtney said to have the eva already

656
00:23:04,070 --> 00:23:02,960
planned there's that is significant

657
00:23:05,830 --> 00:23:04,080
because there's quite a bit of work to

658
00:23:07,909 --> 00:23:05,840
configure the airlock and get everything

659
00:23:09,750 --> 00:23:07,919
set up for the crews to to use the suits

660
00:23:11,669 --> 00:23:09,760
and all that work was already

661
00:23:12,870 --> 00:23:11,679
a lot of it done

662
00:23:15,430 --> 00:23:12,880
there was a little probably a little bit

663
00:23:17,510 --> 00:23:15,440

left to do as we came towards thursday

664
00:23:19,270 --> 00:23:17,520
but that you know that was really a

665
00:23:21,590 --> 00:23:19,280
blessing in terms of the time to get to

666
00:23:23,110 --> 00:23:21,600
this job

667
00:23:25,430 --> 00:23:23,120
since as you mentioned this is a test

668
00:23:26,149 --> 00:23:25,440
that's been well rehearsed well planned

669
00:23:28,149 --> 00:23:26,159
for

670
00:23:30,549 --> 00:23:28,159
um what are the potential snags during

671
00:23:32,950 --> 00:23:30,559
the eva where would you expect if there

672
00:23:35,350 --> 00:23:32,960
was to be a hang-up in terms of removing

673
00:23:38,470 --> 00:23:35,360
or replacing the unit

674
00:23:40,230 --> 00:23:38,480
where the where um doug wheelock and

675
00:23:41,830 --> 00:23:40,240
tracy caldwell dyson might run into the

676
00:23:44,870 --> 00:23:41,840
most trouble

677
00:23:47,669 --> 00:23:44,880
um well we trained the big 14 tasks

678
00:23:49,590 --> 00:23:47,679
primarily like i said task based so a

679
00:23:51,590 --> 00:23:49,600
lot of the choreography that goes into

680
00:23:53,750 --> 00:23:51,600
an eva about which way you're going to

681
00:23:56,710 --> 00:23:53,760
maneuver and in what order you're going

682
00:23:58,630 --> 00:23:56,720
to do particular steps that is usually

683
00:24:00,310 --> 00:23:58,640
not worked out to the level of detail

684
00:24:02,390 --> 00:24:00,320
that they can train that

685
00:24:03,430 --> 00:24:02,400
that detailed timeline

686
00:24:05,430 --> 00:24:03,440
before

687
00:24:06,549 --> 00:24:05,440
during their generic training um so a

688
00:24:08,789 --> 00:24:06,559

lot of what we're doing in the

689
00:24:12,310 --> 00:24:08,799
development runs are working out those

690
00:24:14,549 --> 00:24:12,320
details um this the areas where we would

691
00:24:16,070 --> 00:24:14,559
uh more more than likely run into snags

692
00:24:17,750 --> 00:24:16,080
have to do with when we're manipu

693
00:24:19,669 --> 00:24:17,760
manipulating the ammonia quick

694
00:24:20,789 --> 00:24:19,679
disconnect

695
00:24:23,909 --> 00:24:20,799
plumbing

696
00:24:25,590 --> 00:24:23,919
to disconnect the actual failed

697
00:24:27,830 --> 00:24:25,600
pump module oru

698
00:24:30,230 --> 00:24:27,840
when we do the vent of that pump module

699
00:24:32,230 --> 00:24:30,240
that we may run into some snags there

700
00:24:34,470 --> 00:24:32,240
although that is something that's pretty

701
00:24:37,190 --> 00:24:34,480
well analyzed on how to do so we're not

702
00:24:39,029 --> 00:24:37,200
anticipating any significantly different

703
00:24:40,549 --> 00:24:39,039
uh conditions as a result of that it's

704
00:24:42,230 --> 00:24:40,559
just the actual execution of it

705
00:24:43,909 --> 00:24:42,240
depending on how we do that and how we

706
00:24:46,950 --> 00:24:43,919
choreograph it where we may run into

707
00:24:49,110 --> 00:24:46,960
some timing snags so that's really what

708
00:24:51,029 --> 00:24:49,120
we're what we're working on

709
00:24:52,870 --> 00:24:51,039
most of the rest of the task is just

710
00:24:55,029 --> 00:24:52,880
logistics that like i said this is a

711
00:24:58,310 --> 00:24:55,039
difficult box to maneuver with it's it's

712
00:25:00,149 --> 00:24:58,320
a big unwieldy object so

713
00:25:01,909 --> 00:25:00,159

maneuvering it around and handing it off

714
00:25:03,190 --> 00:25:01,919
between crew members if that needs to be

715
00:25:06,070 --> 00:25:03,200
done depending on how we do the

716
00:25:07,909 --> 00:25:06,080
choreography that could take some time

717
00:25:10,390 --> 00:25:07,919
none of that part of it is is

718
00:25:14,950 --> 00:25:10,400
technically difficult but it's just very

719
00:25:17,269 --> 00:25:14,960
time consuming and takes a lot of focus

720
00:25:19,590 --> 00:25:17,279
and just a quick follow-up on that

721
00:25:21,029 --> 00:25:19,600
with regards to logistic support for the

722
00:25:22,870 --> 00:25:21,039
spacewalk

723
00:25:25,430 --> 00:25:22,880
with all the power downs can you use the

724
00:25:26,870 --> 00:25:25,440
cupola and robotics station for the cva

725
00:25:28,390 --> 00:25:26,880
or do you have to go back to the one

726
00:25:30,390 --> 00:25:28,400
that's in destiny what are the what's

727
00:25:32,070 --> 00:25:30,400
the logistics inside we're going back to

728
00:25:34,149 --> 00:25:32,080
the one that's in destiny we actually

729
00:25:36,470 --> 00:25:34,159
some of the units uh for

730
00:25:38,310 --> 00:25:36,480
video transfer uh that we need for the

731
00:25:39,909 --> 00:25:38,320
cupola workstation are not able to be

732
00:25:41,909 --> 00:25:39,919
powered in our current config so we're

733
00:25:43,590 --> 00:25:41,919
not able to use the cupola

734
00:25:45,510 --> 00:25:43,600
the cupola is on the other side of the

735
00:25:47,110 --> 00:25:45,520
space station than this

736
00:25:48,470 --> 00:25:47,120
than the truss segment that we're going

737
00:25:54,230 --> 00:25:48,480
to be working on though so that's

738
00:25:59,190 --> 00:25:56,710

nbc and uh courtney you said it's a big

739
00:26:00,950 --> 00:25:59,200
unwheely object would it would a third

740
00:26:02,149 --> 00:26:00,960
or fourth set of hands outside be of any

741
00:26:03,990 --> 00:26:02,159
help to you have you been thinking of

742
00:26:05,830 --> 00:26:04,000
some of these out of the box

743
00:26:07,510 --> 00:26:05,840
opportunities you have

744
00:26:10,549 --> 00:26:07,520
considering who's on the station and who

745
00:26:12,789 --> 00:26:10,559
else is eva trained we are not we

746
00:26:15,350 --> 00:26:12,799
actually tracy and doug are the are the

747
00:26:17,510 --> 00:26:15,360
us eva crew members who are emu

748
00:26:18,549 --> 00:26:17,520
certified so they're the ones doing this

749
00:26:20,470 --> 00:26:18,559
and

750
00:26:23,110 --> 00:26:20,480
we have not ever discussed having a

751
00:26:24,950 --> 00:26:23,120
third person on this on this eva a third

752
00:26:26,789 --> 00:26:24,960
set of hands probably would not help us

753
00:26:29,029 --> 00:26:26,799
with this it's really just a matter of

754
00:26:30,870 --> 00:26:29,039
choreographing who's getting the spare

755
00:26:33,190 --> 00:26:30,880
and then who's putting it in and that

756
00:26:34,870 --> 00:26:33,200
kind of stuff having the arm available

757
00:26:36,789 --> 00:26:34,880
having the robotic arm available is a

758
00:26:38,950 --> 00:26:36,799
huge help so that really is going to

759
00:26:40,950 --> 00:26:38,960
help us make some efficiencies in the

760
00:26:42,710 --> 00:26:40,960
timeline i'd like to ask more about the

761
00:26:44,789 --> 00:26:42,720
arm because you i was confused by your

762
00:26:45,830 --> 00:26:44,799
discussion about the arm is single

763
00:26:47,990 --> 00:26:45,840

string

764
00:26:49,430 --> 00:26:48,000
right now and so your whole planning

765
00:26:50,950 --> 00:26:49,440
would have to assume at some point the

766
00:26:54,310 --> 00:26:50,960
arm may stop at any point in the

767
00:26:56,070 --> 00:26:54,320
operations that's correct so what in

768
00:26:58,390 --> 00:26:56,080
if we hadn't had this failure and we

769
00:27:00,230 --> 00:26:58,400
were planning arm operations we would be

770
00:27:02,230 --> 00:27:00,240
running it single string and then if we

771
00:27:05,110 --> 00:27:02,240
had a problem with it we would power up

772
00:27:07,269 --> 00:27:05,120
the second string and switch strings

773
00:27:09,029 --> 00:27:07,279
so essentially for any operation that

774
00:27:09,909 --> 00:27:09,039
we're doing with the arm

775
00:27:13,750 --> 00:27:09,919
we

776
00:27:14,950 --> 00:27:13,760
the other string and then continue

777
00:27:16,390 --> 00:27:14,960
operations

778
00:27:18,149 --> 00:27:16,400
the analysis and the work that the

779
00:27:20,789 --> 00:27:18,159
engineering team has done over the last

780
00:27:23,269 --> 00:27:20,799
couple days has shown that our we have

781
00:27:25,269 --> 00:27:23,279
flight rules in place that say it's okay

782
00:27:27,510 --> 00:27:25,279
to run

783
00:27:30,470 --> 00:27:27,520
uncooled ddcus for a certain amount of

784
00:27:32,710 --> 00:27:30,480
time or to a certain temperature limit

785
00:27:35,029 --> 00:27:32,720
in order to regain functionality if you

786
00:27:37,510 --> 00:27:35,039
need it in a critical situation so

787
00:27:39,350 --> 00:27:37,520
having a crew member on a robotic arm

788
00:27:41,510 --> 00:27:39,360

during an eva certainly counts as a

789
00:27:44,070 --> 00:27:41,520
critical situation so we would be able

790
00:27:46,070 --> 00:27:44,080
to power it up uncooled for a limited

791
00:27:48,630 --> 00:27:46,080
period of time which is enough to get

792
00:27:50,230 --> 00:27:48,640
the crew member to safety the team is

793
00:27:53,350 --> 00:27:50,240
continuing to do some testing and

794
00:27:56,070 --> 00:27:53,360
analysis to see if we can possibly rely

795
00:27:58,310 --> 00:27:56,080
on those ddcus cooling themselves long

796
00:28:00,230 --> 00:27:58,320
enough to complete the eva if we had

797
00:28:02,070 --> 00:28:00,240
that happen in the middle of the eva so

798
00:28:04,470 --> 00:28:02,080
we at a minimum we can get them to

799
00:28:06,310 --> 00:28:04,480
safety and pick up with contingency

800
00:28:07,669 --> 00:28:06,320
options for the completion of the eva

801
00:28:09,669 --> 00:28:07,679
without the arm

802
00:28:11,430 --> 00:28:09,679
we are hoping to be able to rely on the

803
00:28:12,630 --> 00:28:11,440
arm through the whole eva

804
00:28:14,149 --> 00:28:12,640
this is an important point for us to

805
00:28:15,750 --> 00:28:14,159
make out here because

806
00:28:18,070 --> 00:28:15,760
losing cooling does not mean you lose

807
00:28:20,070 --> 00:28:18,080
the power immediately okay

808
00:28:22,710 --> 00:28:20,080
yeah the power is still good it's just a

809
00:28:24,950 --> 00:28:22,720
matter of can we keep the can we manage

810
00:28:26,789 --> 00:28:24,960
the use of the power units that are

811
00:28:30,310 --> 00:28:26,799
uncooled um to keep them from

812
00:28:31,909 --> 00:28:30,320
overheating and even if they do overheat

813
00:28:33,269 --> 00:28:31,919

there may be a trade-off there well

814
00:28:34,870 --> 00:28:33,279
there's there's heating and then there's

815
00:28:36,870 --> 00:28:34,880
overheating we know they will get warmer

816
00:28:38,470 --> 00:28:36,880
than they usually get because the

817
00:28:40,789 --> 00:28:38,480
cooling loop is gone

818
00:28:42,549 --> 00:28:40,799
we think that while we know for sure

819
00:28:44,630 --> 00:28:42,559
that it's okay to run until we hit a

820
00:28:46,710 --> 00:28:44,640
certain limit and that is certainly

821
00:28:48,230 --> 00:28:46,720
enough time to get the crew to safety we

822
00:28:50,549 --> 00:28:48,240
think and we're doing some testing to

823
00:28:52,389 --> 00:28:50,559
prove that we should be able to manage

824
00:28:54,230 --> 00:28:52,399
running with the with the secondary

825
00:28:56,630 --> 00:28:54,240
power unit through the rest of the eva

826
00:28:58,070 --> 00:28:56,640
if we had to if we had that failure and

827
00:28:59,590 --> 00:28:58,080
and once we know that then we don't have

828
00:29:01,190 --> 00:28:59,600
to worry about contingency planning a

829
00:29:03,190 --> 00:29:01,200
similar question for mike in the issue

830
00:29:04,789 --> 00:29:03,200
of life support again with the total

831
00:29:06,389 --> 00:29:04,799
failure of power in the on the u.s

832
00:29:07,909 --> 00:29:06,399
segment you still

833
00:29:09,830 --> 00:29:07,919
because in the volume of the segment you

834
00:29:12,230 --> 00:29:09,840
still have what five six eight days

835
00:29:13,990 --> 00:29:12,240
worth of base life support and then just

836
00:29:15,909 --> 00:29:14,000
breathing the air that's in the segment

837
00:29:17,029 --> 00:29:15,919
before you start getting

838
00:29:19,669 --> 00:29:17,039

hazardous

839
00:29:22,870 --> 00:29:19,679
no it won't be that long a ppco2 arise

840
00:29:24,870 --> 00:29:22,880
but but we have lyo cans for

841
00:29:26,630 --> 00:29:24,880
i think 17 days

842
00:29:28,549 --> 00:29:26,640
and and so the russian segment will be

843
00:29:30,470 --> 00:29:28,559
scrubbing at the maxi can we have a new

844
00:29:33,110 --> 00:29:30,480
vos duke we can stall even more out of

845
00:29:34,149 --> 00:29:33,120
the how the russian ppco2 system oxygen

846
00:29:35,510 --> 00:29:34,159
will last

847
00:29:37,350 --> 00:29:35,520
i don't know where we are we'll have to

848
00:29:39,510 --> 00:29:37,360
look at where we are in oxygen but

849
00:29:41,510 --> 00:29:39,520
usually we can get several days

850
00:29:43,590 --> 00:29:41,520
out of the oxygen and of course you know

851
00:29:45,110 --> 00:29:43,600
temperatures would slowly rise over time

852
00:29:46,630 --> 00:29:45,120
as well but the russian segment will be

853
00:29:48,310 --> 00:29:46,640
cooling the stack

854
00:29:50,310 --> 00:29:48,320
as well so with the russian segment

855
00:29:51,590 --> 00:29:50,320
running we have quite a bit of time i

856
00:29:54,070 --> 00:29:51,600
mean

857
00:29:56,310 --> 00:29:54,080
multiple multiple days because the the

858
00:29:58,710 --> 00:29:56,320
electron can be activated

859
00:30:00,310 --> 00:29:58,720
uh at a higher level we they we've got

860
00:30:02,389 --> 00:30:00,320
an older electron in there but there is

861
00:30:04,149 --> 00:30:02,399
a there is a spare on orbit

862
00:30:05,669 --> 00:30:04,159
as i mentioned there's an older ros duke

863
00:30:08,549 --> 00:30:05,679

in place but we have a spare we can

864
00:30:10,310 --> 00:30:08,559
replace and give us more capacity

865
00:30:12,070 --> 00:30:10,320
and of course they can cool the stack as

866
00:30:13,909 --> 00:30:12,080
well so really we're

867
00:30:16,710 --> 00:30:13,919
from a life support standpoint we'd be

868
00:30:19,029 --> 00:30:16,720
in in good shape

869
00:30:20,710 --> 00:30:19,039
okay where do i get a list of the big 14

870
00:30:21,990 --> 00:30:20,720
is there a list of them somewhere or oh

871
00:30:26,389 --> 00:30:22,000
yeah i don't need it right now okay we

872
00:30:29,350 --> 00:30:27,750
those are all the questions so i want to

873
00:30:31,510 --> 00:30:29,360
ask about the jumper cables later on but

874
00:30:32,630 --> 00:30:31,520
that's an offline question too

875
00:30:34,549 --> 00:30:32,640
okay very good

876
00:30:36,789 --> 00:30:34,559
um that's all over questions here at jfc

877
00:30:38,630 --> 00:30:36,799
for now we'll be sending

878
00:30:40,789 --> 00:30:38,640
folks out to kennedy space center but

879
00:30:42,470 --> 00:30:40,799
just as a little input somebody asked

880
00:30:44,549 --> 00:30:42,480
earlier how much the

881
00:30:47,750 --> 00:30:44,559
oru weighed and total weight of that

882
00:30:49,190 --> 00:30:47,760
pump module is 780 pounds

883
00:30:50,789 --> 00:30:49,200
so with that we'll go ahead and go to

884
00:30:53,830 --> 00:30:50,799
kennedy space center for questions from

885
00:30:59,669 --> 00:30:56,710
yes hi marcia dunn associated press

886
00:31:01,909 --> 00:30:59,679
question for mike to start off with

887
00:31:04,070 --> 00:31:01,919
assuming there that you did not lose

888
00:31:06,710 --> 00:31:04,080

your second coolant loop how long could

889
00:31:07,990 --> 00:31:06,720
you keep going along with the way it is

890
00:31:10,389 --> 00:31:08,000
today

891
00:31:12,470 --> 00:31:10,399
if for any reason the space walk had to

892
00:31:15,269 --> 00:31:12,480
be put off or

893
00:31:17,909 --> 00:31:15,279
you put in a new pump and it didn't work

894
00:31:19,509 --> 00:31:17,919
indefinitely we we

895
00:31:20,870 --> 00:31:19,519
don't get

896
00:31:22,710 --> 00:31:20,880
you know what we're limited now is how

897
00:31:24,789 --> 00:31:22,720
many systems

898
00:31:26,789 --> 00:31:24,799
can you run at any one time and so

899
00:31:28,710 --> 00:31:26,799
research would be affected if we stayed

900
00:31:30,630 --> 00:31:28,720
in this position for a long period of

901
00:31:32,470 --> 00:31:30,640
time because we can't operate

902
00:31:34,870 --> 00:31:32,480
as many racks

903
00:31:36,389 --> 00:31:34,880
as we'd like in fact over i think it was

904
00:31:40,389 --> 00:31:36,399
last week

905
00:31:42,310 --> 00:31:40,399
track now we had the most research racks

906
00:31:44,310 --> 00:31:42,320
up ever i think we had 13 racks active

907
00:31:45,909 --> 00:31:44,320
at one time on board

908
00:31:48,070 --> 00:31:45,919
which is just an amazing feat and it

909
00:31:49,509 --> 00:31:48,080
shows that we've we are transitioning as

910
00:31:51,190 --> 00:31:49,519
we said we would to

911
00:31:53,029 --> 00:31:51,200
utilization environment well that

912
00:31:54,070 --> 00:31:53,039
doesn't happen with uh

913
00:31:56,950 --> 00:31:54,080

uh

914
00:31:58,710 --> 00:31:56,960
without more cooling for sure so it

915
00:32:01,190 --> 00:31:58,720
would it would limit our ability to do

916
00:32:03,430 --> 00:32:01,200
normal research but there's no risk to

917
00:32:05,110 --> 00:32:03,440
the rest of the systems now we'd have to

918
00:32:06,870 --> 00:32:05,120
work separate failures after that and

919
00:32:08,310 --> 00:32:06,880
things of this nature but

920
00:32:09,990 --> 00:32:08,320
we could go for

921
00:32:13,269 --> 00:32:10,000
like i said indefinitely as long as you

922
00:32:17,350 --> 00:32:15,990
and right now are you doing any science

923
00:32:19,029 --> 00:32:17,360
up there

924
00:32:21,029 --> 00:32:19,039
i'm wondering or has all that been

925
00:32:23,909 --> 00:32:21,039
curtailed and

926
00:32:26,830 --> 00:32:23,919
also how sure are you that another pump

927
00:32:29,110 --> 00:32:26,840
won't suffer the same

928
00:32:31,190 --> 00:32:29,120
problem uh let's see for the first

929
00:32:33,430 --> 00:32:31,200
answer it's very limited par partly

930
00:32:35,110 --> 00:32:33,440
because of the fact that we're focusing

931
00:32:36,549 --> 00:32:35,120
the crew's time on preparation for the

932
00:32:39,350 --> 00:32:36,559
eba but

933
00:32:42,470 --> 00:32:39,360
we we also have some racks that are down

934
00:32:45,029 --> 00:32:42,480
um not many but some that are down

935
00:32:46,789 --> 00:32:45,039
we could get you specifics uh of what's

936
00:32:48,310 --> 00:32:46,799
going on but it is very limited and

937
00:32:50,310 --> 00:32:48,320
mostly again because the crew is

938
00:32:52,470 --> 00:32:50,320

focusing on getting ready for the eva so

939
00:32:54,950 --> 00:32:52,480
they have to study as well

940
00:32:56,549 --> 00:32:54,960
they've got a a qd

941
00:32:58,389 --> 00:32:56,559
training board up there mock-up that

942
00:32:59,909 --> 00:32:58,399
allows them to practice with the ammonia

943
00:33:01,990 --> 00:32:59,919
qd's and things of this nature so

944
00:33:03,990 --> 00:33:02,000
they're they're busy getting ready for

945
00:33:05,430 --> 00:33:04,000
the eva

946
00:33:07,750 --> 00:33:05,440
and what was your other question i'm

947
00:33:08,630 --> 00:33:07,760
sorry i forgot

948
00:33:11,029 --> 00:33:08,640
um

949
00:33:12,870 --> 00:33:11,039
how are you sure that another ammonia

950
00:33:14,789 --> 00:33:12,880
tank will just i mean a pump another

951
00:33:18,230 --> 00:33:14,799
pump won't just trigger another circuit

952
00:33:19,430 --> 00:33:18,240
breaker failure yeah i'm i'm sorry um

953
00:33:21,350 --> 00:33:19,440
you didn't say it so long ago i

954
00:33:22,470 --> 00:33:21,360
shouldn't remember what the question was

955
00:33:24,789 --> 00:33:22,480
i'm not

956
00:33:26,470 --> 00:33:24,799
but i can tell you that um the mean time

957
00:33:28,470 --> 00:33:26,480
between failure

958
00:33:31,990 --> 00:33:28,480
uh suggests that uh we shouldn't be

959
00:33:34,630 --> 00:33:33,750
anytime soon

960
00:33:36,789 --> 00:33:34,640
um

961
00:33:39,029 --> 00:33:36,799
so it's like anything marcia you you

962
00:33:40,310 --> 00:33:39,039
can't guarantee any system is going to

963
00:33:41,590 --> 00:33:40,320

keep running

964
00:33:46,950 --> 00:33:41,600
and

965
00:33:49,110 --> 00:33:46,960
are where the next failure is uh

966
00:33:50,710 --> 00:33:49,120
is significant to you then you you try

967
00:33:52,870 --> 00:33:50,720
to get outside and do evas as soon as

968
00:33:54,549 --> 00:33:52,880
you can so if courtney comes back with

969
00:33:56,149 --> 00:33:54,559
the team and says we need two more days

970
00:33:58,070 --> 00:33:56,159
to get ready for the eba then what we'll

971
00:33:59,669 --> 00:33:58,080
do is grant her two more days because

972
00:34:03,350 --> 00:33:59,679
you need the team to go out there and do

973
00:34:04,630 --> 00:34:03,360
the job as safely as humanly possible

974
00:34:09,909 --> 00:34:04,640
and

975
00:34:11,990 --> 00:34:09,919
worth the risk instead of rushing him

976
00:34:13,190 --> 00:34:12,000
out the door and and you know having a

977
00:34:16,869 --> 00:34:13,200
problem because you didn't think it all

978
00:34:21,030 --> 00:34:18,869
um and and for courtney i'm wondering

979
00:34:23,589 --> 00:34:21,040
what is the distance between the

980
00:34:26,069 --> 00:34:23,599
failed pump and where the spare

981
00:34:28,149 --> 00:34:26,079
replacement part is located and if you

982
00:34:29,829 --> 00:34:28,159
could just estimate and feed and when do

983
00:34:31,589 --> 00:34:29,839
you expect the decision on whether

984
00:34:33,829 --> 00:34:31,599
thursday is going to be a viable option

985
00:34:35,589 --> 00:34:33,839
for the spacewalk i'm going to need to

986
00:34:37,430 --> 00:34:35,599
check on the distance numbers for you i

987
00:34:39,430 --> 00:34:37,440
would estimate about 30 feet but i need

988
00:34:41,270 --> 00:34:39,440

to double check that

989
00:34:43,030 --> 00:34:41,280
let's see and and in terms of whether or

990
00:34:44,389 --> 00:34:43,040
not or when we're going to decide about

991
00:34:45,829 --> 00:34:44,399
thursday we're going to have a first

992
00:34:47,349 --> 00:34:45,839
assessment of that

993
00:34:49,430 --> 00:34:47,359
today after the

994
00:34:50,310 --> 00:34:49,440
completion of the nbl run so later this

995
00:34:51,990 --> 00:34:50,320
evening

996
00:34:58,710 --> 00:34:52,000
and i expect we'll make a decision about

997
00:35:02,790 --> 00:35:01,670
hi this is james dain from florida today

998
00:35:05,109 --> 00:35:02,800
um

999
00:35:07,270 --> 00:35:05,119
mr suffredini you were

1000
00:35:10,310 --> 00:35:07,280
describing things as being

1001
00:35:12,230 --> 00:35:10,320
near nominal in terms of operations in

1002
00:35:13,670 --> 00:35:12,240
the current configuration but we're

1003
00:35:16,630 --> 00:35:13,680
talking about a

1004
00:35:18,470 --> 00:35:16,640
failure that affects like half the u.s

1005
00:35:19,910 --> 00:35:18,480
segment system so i just wondering if

1006
00:35:21,910 --> 00:35:19,920
you could compare

1007
00:35:23,750 --> 00:35:21,920
a little more like what

1008
00:35:25,750 --> 00:35:23,760
life on the station is right now for the

1009
00:35:27,589 --> 00:35:25,760
crew in the us segment versus what it

1010
00:35:29,510 --> 00:35:27,599
would be normally if there are

1011
00:35:31,430 --> 00:35:29,520
more lights out or more

1012
00:35:34,150 --> 00:35:31,440
certain modules that

1013
00:35:35,510 --> 00:35:34,160

won't they won't go into or that certain

1014
00:35:38,230 --> 00:35:35,520
facilities within them that can't be

1015
00:35:40,150 --> 00:35:38,240
used things like restrooms or

1016
00:35:46,710 --> 00:35:40,160
you know sort of stuff that's part of

1017
00:35:51,829 --> 00:35:49,750
near nominal is a is a is not a phrase

1018
00:35:53,589 --> 00:35:51,839
that i would use to describe where we're

1019
00:35:57,109 --> 00:35:53,599
at what i would tell you is all the

1020
00:35:59,270 --> 00:35:57,119
critical systems are operational and and

1021
00:36:00,870 --> 00:35:59,280
in fact many of the non-critical systems

1022
00:36:01,589 --> 00:36:00,880
are operational so

1023
00:36:03,750 --> 00:36:01,599
uh

1024
00:36:07,270 --> 00:36:03,760
none of the modules are closed and and

1025
00:36:09,030 --> 00:36:07,280
locked up with lights off but uh

1026
00:36:11,190 --> 00:36:09,040
for instance we have two cooling loops

1027
00:36:13,030 --> 00:36:11,200
in the in the columbus module we do have

1028
00:36:15,190 --> 00:36:13,040
one of the pumps off

1029
00:36:16,630 --> 00:36:15,200
in the clock in the columbus module uh

1030
00:36:19,109 --> 00:36:16,640
to preserve

1031
00:36:20,790 --> 00:36:19,119
uh the power that we would otherwise uh

1032
00:36:22,630 --> 00:36:20,800
be consuming with that

1033
00:36:23,589 --> 00:36:22,640
the same is true in node two one of the

1034
00:36:25,670 --> 00:36:23,599
two

1035
00:36:27,430 --> 00:36:25,680
coolant loops is powered off it's

1036
00:36:29,910 --> 00:36:27,440
available if we need it but it's powered

1037
00:36:30,870 --> 00:36:29,920
off right now

1038
00:36:33,109 --> 00:36:30,880

so

1039
00:36:34,870 --> 00:36:33,119
light unnecessary lights are off

1040
00:36:36,870 --> 00:36:34,880
unnecessary heaters are off things of

1041
00:36:37,750 --> 00:36:36,880
this nature

1042
00:36:39,990 --> 00:36:37,760
but

1043
00:36:41,750 --> 00:36:40,000
we don't have any restrictions if you

1044
00:36:44,470 --> 00:36:41,760
will it's really today it's about

1045
00:36:46,550 --> 00:36:44,480
managing power

1046
00:36:48,390 --> 00:36:46,560
on the good side because you only have

1047
00:36:51,109 --> 00:36:48,400
so much that you can provide and then

1048
00:36:53,109 --> 00:36:51,119
therefore cool and and

1049
00:36:56,550 --> 00:36:53,119
and utilizing

1050
00:36:58,230 --> 00:36:56,560
power on the on the fail pump side down

1051
00:37:00,550 --> 00:36:58,240
to a minimal number that we don't

1052
00:37:02,870 --> 00:37:00,560
overheat the ddc use and we do that in a

1053
00:37:07,190 --> 00:37:02,880
few cases not not many

1054
00:37:08,710 --> 00:37:07,200
um so uh we're we're in

1055
00:37:10,790 --> 00:37:08,720
i'm i'm trying to leave you with the

1056
00:37:12,390 --> 00:37:10,800
idea that everything the crew needs to

1057
00:37:13,990 --> 00:37:12,400
survive they're in good shape all those

1058
00:37:16,150 --> 00:37:14,000
systems are active

1059
00:37:18,630 --> 00:37:16,160
um and what we're talking about really

1060
00:37:20,390 --> 00:37:18,640
is uh it's a it'll be a significant

1061
00:37:22,390 --> 00:37:20,400
challenge if we suffer the next failure

1062
00:37:24,950 --> 00:37:22,400
but it's not normal because

1063
00:37:26,470 --> 00:37:24,960

we can't do normal operations with these

1064
00:37:27,910 --> 00:37:26,480
power downs and the fact that we need to

1065
00:37:30,230 --> 00:37:27,920
get on with the

1066
00:37:33,270 --> 00:37:30,240
eva the crew is really focused on this

1067
00:37:34,390 --> 00:37:33,280
on this eba as is the team

1068
00:37:39,349 --> 00:37:34,400
and

1069
00:37:40,630 --> 00:37:39,359
describe on orbit as normal as much as

1070
00:37:43,030 --> 00:37:40,640
focused on the

1071
00:37:47,349 --> 00:37:43,040
on a significant eva that we need to get

1072
00:37:50,950 --> 00:37:50,150
um thank you and i was wondering if the

1073
00:37:52,790 --> 00:37:50,960
uh

1074
00:37:55,270 --> 00:37:52,800
the tasks that are being deferred from

1075
00:37:58,630 --> 00:37:55,280
the originally scheduled spacewalk um do

1076
00:37:59,990 --> 00:37:58,640
those need to be required before 133

1077
00:38:00,870 --> 00:38:00,000
arrives or is that something that could

1078
00:38:01,990 --> 00:38:00,880
be

1079
00:38:05,510 --> 00:38:02,000
added to

1080
00:38:08,230 --> 00:38:05,520
the 133 timeline we have a uh

1081
00:38:11,430 --> 00:38:08,240
a one of those tasks was once we one we

1082
00:38:14,550 --> 00:38:11,440
need to do before we installed the pmm

1083
00:38:20,069 --> 00:38:14,560
there is a a connector

1084
00:38:22,069 --> 00:38:20,079
that is necessary to allow us to

1085
00:38:24,069 --> 00:38:22,079
change out if you can believe it change

1086
00:38:26,870 --> 00:38:24,079
out a heat exchanger on node three

1087
00:38:29,109 --> 00:38:26,880
should that ever become necessary

1088
00:38:32,710 --> 00:38:29,119

that connector plugs into an area that

1089
00:38:34,150 --> 00:38:32,720
we won't be able to get to once the pmm

1090
00:38:36,150 --> 00:38:34,160
is installed

1091
00:38:38,310 --> 00:38:36,160
and so what we'd like to do is get that

1092
00:38:40,710 --> 00:38:38,320
connector the plan one of the tasks on

1093
00:38:42,710 --> 00:38:40,720
this eva was to connect

1094
00:38:44,950 --> 00:38:42,720
that connector up to that location and

1095
00:38:46,630 --> 00:38:44,960
then we would just

1096
00:38:48,470 --> 00:38:46,640
wire tie it out of the way somewhere and

1097
00:38:49,829 --> 00:38:48,480
then it'd be available for use with the

1098
00:38:52,069 --> 00:38:49,839
note 3 if we ever had to do the heat

1099
00:38:53,430 --> 00:38:52,079
exchanger change out

1100
00:38:55,109 --> 00:38:53,440
so we would still have that in front of

1101
00:38:57,349 --> 00:38:55,119
us to try to do before we install the

1102
00:38:59,190 --> 00:38:57,359
pmm and we'd talk about

1103
00:39:04,630 --> 00:38:59,200
when's the right time today we don't

1104
00:39:07,589 --> 00:39:06,230
so we'll have to you know have to think

1105
00:39:12,230 --> 00:39:07,599
about where that might fit for the

1106
00:39:16,390 --> 00:39:14,150
thanks finally for for courtney i i

1107
00:39:17,910 --> 00:39:16,400
assume um talking about a minimum of two

1108
00:39:20,470 --> 00:39:17,920
evas that we're talking about sort of a

1109
00:39:22,390 --> 00:39:20,480
standard six six and a half hour type

1110
00:39:24,550 --> 00:39:22,400
length for each of these or obviously

1111
00:39:26,950 --> 00:39:24,560
depending kind of how they go each day

1112
00:39:29,270 --> 00:39:26,960
but is that the nominal plan or that is

1113
00:39:30,630 --> 00:39:29,280

the nominal plan it depends it's going

1114
00:39:32,310 --> 00:39:30,640
to depend on how they're doing it's

1115
00:39:34,069 --> 00:39:32,320
going to depend on consumables and it's

1116
00:39:36,870 --> 00:39:34,079
going to depend again since we're

1117
00:39:39,109 --> 00:39:36,880
manipulating ammonia connections it's

1118
00:39:41,190 --> 00:39:39,119
going to depend on making sure we allow

1119
00:39:43,109 --> 00:39:41,200
plenty of time to clean up

1120
00:39:47,910 --> 00:39:43,119
any ammonia that the crew

1121
00:39:50,790 --> 00:39:49,190
okay i understand that's all of our

1122
00:39:52,950 --> 00:39:50,800
questions from kennedy space center

1123
00:39:54,790 --> 00:39:52,960
we'll go out to nasa headquarters in

1124
00:39:58,470 --> 00:39:54,800
washington dc and take questions there

1125
00:40:02,630 --> 00:40:00,310
okay uh this is mark matthews with the

1126
00:40:04,230 --> 00:40:02,640
orlando sentinel thank you guys i had a

1127
00:40:06,550 --> 00:40:04,240
quick question are you guys looking to

1128
00:40:10,470 --> 00:40:06,560
bring back the bru the broken pup module

1129
00:40:13,030 --> 00:40:11,270
uh

1130
00:40:15,270 --> 00:40:13,040
discovery flight i'm sorry i'm drawing a

1131
00:40:17,109 --> 00:40:15,280
blank which flight is discovery that the

1132
00:40:20,230 --> 00:40:17,119
next one

1133
00:40:21,750 --> 00:40:20,240
133 no it won't well i it the probably

1134
00:40:23,510 --> 00:40:21,760
easier answer would be to say it won't

1135
00:40:25,670 --> 00:40:23,520
fit on the next two flights we don't

1136
00:40:27,270 --> 00:40:25,680
have you you need a fairly large carrier

1137
00:40:29,430 --> 00:40:27,280
to carry this thing home

1138
00:40:32,309 --> 00:40:29,440

and uh and so you can't just pluck it

1139
00:40:34,150 --> 00:40:32,319
anywhere so the next two flights are

1140
00:40:37,670 --> 00:40:34,160
are not conducive to returning the pump

1141
00:40:41,910 --> 00:40:40,150
does that mean uh the possibility if uh

1142
00:40:43,670 --> 00:40:41,920
the white house in congress decides to

1143
00:40:45,430 --> 00:40:43,680
go with the third flight could could it

1144
00:40:50,309 --> 00:40:45,440
potentially find a home in one on that

1145
00:40:55,030 --> 00:40:53,109
okay and then just uh another follow-up

1146
00:40:57,109 --> 00:40:55,040
is the is the russian segment on a

1147
00:40:58,950 --> 00:40:57,119
separate cooling system

1148
00:41:01,270 --> 00:40:58,960
correct

1149
00:41:04,390 --> 00:41:01,280
we do provide some power to the russian

1150
00:41:05,750 --> 00:41:04,400
segment but uh the russian segment cools

1151
00:41:08,550 --> 00:41:05,760
itself

1152
00:41:10,870 --> 00:41:08,560
and so we're relatively independent

1153
00:41:12,150 --> 00:41:10,880
in that respect

1154
00:41:15,030 --> 00:41:12,160
in fact the russian segment is

1155
00:41:16,390 --> 00:41:15,040
completely independent we provide

1156
00:41:18,309 --> 00:41:16,400
power

1157
00:41:20,630 --> 00:41:18,319
for a number of reasons part of the

1158
00:41:22,710 --> 00:41:20,640
configuration for the fgb always assumed

1159
00:41:24,950 --> 00:41:22,720
that we would provide power and so if

1160
00:41:26,870 --> 00:41:24,960
you look at pictures of the us of the

1161
00:41:29,430 --> 00:41:26,880
iss today you'll see the solar rays on

1162
00:41:31,829 --> 00:41:29,440
the fgb are retracted so we provide

1163
00:41:35,430 --> 00:41:31,839

power for for the fgb in addition we

1164
00:41:36,470 --> 00:41:35,440
provide a power to the service module

1165
00:41:37,990 --> 00:41:36,480
as it

1166
00:41:40,950 --> 00:41:38,000
picks up more and more

1167
00:41:43,430 --> 00:41:40,960
a task and the solar rays on the russian

1168
00:41:45,670 --> 00:41:43,440
side degrade a little over time it's

1169
00:41:47,670 --> 00:41:45,680
it's beneficial also they can't quite

1170
00:41:48,790 --> 00:41:47,680
point theirs as efficiently as we can

1171
00:41:52,470 --> 00:41:48,800
point

1172
00:41:54,230 --> 00:41:52,480
the big solar arrays and so it's it's

1173
00:41:55,829 --> 00:41:54,240
more convenient for us to provide them

1174
00:41:56,950 --> 00:41:55,839
the power

1175
00:42:00,069 --> 00:41:56,960
and so

1176
00:42:01,829 --> 00:42:00,079
so if we get to the point we have to

1177
00:42:03,990 --> 00:42:01,839
completely shed all power they would

1178
00:42:05,589 --> 00:42:04,000
have to make some changes as well we

1179
00:42:07,109 --> 00:42:05,599
probably point the vehicle a little bit

1180
00:42:09,510 --> 00:42:07,119
different during those periods as well

1181
00:42:13,030 --> 00:42:09,520
to provide them maximum power but they

1182
00:42:17,190 --> 00:42:15,349
okay and then uh just a final question

1183
00:42:19,270 --> 00:42:17,200
could you go in a little bit more detail

1184
00:42:21,270 --> 00:42:19,280
about which experiments have been

1185
00:42:23,670 --> 00:42:21,280
affected by the knockout of the one

1186
00:42:26,230 --> 00:42:23,680
cooling system

1187
00:42:27,030 --> 00:42:26,240
the only research well let me let me

1188
00:42:29,829 --> 00:42:27,040

think

1189
00:42:32,230 --> 00:42:29,839
one of the melfi freezers was shut down

1190
00:42:34,230 --> 00:42:32,240
we took out all of the samples from that

1191
00:42:35,589 --> 00:42:34,240
freezer and put it into the one freezer

1192
00:42:41,109 --> 00:42:35,599
that's active

1193
00:42:45,510 --> 00:42:43,510
and there was a third rack

1194
00:42:48,069 --> 00:42:45,520
it evades me right now we can get that

1195
00:42:50,230 --> 00:42:48,079
information for you

1196
00:42:52,630 --> 00:42:50,240
okay that's all of our questions from

1197
00:42:54,150 --> 00:42:52,640
washington we do have several reporters

1198
00:42:56,790 --> 00:42:54,160
on the phone bridge

1199
00:42:58,870 --> 00:42:56,800
we'll start first with ken chang from

1200
00:43:00,790 --> 00:42:58,880
new york times

1201
00:43:03,030 --> 00:43:00,800
yes hi thank you um

1202
00:43:05,349 --> 00:43:03,040
what was the expected lifetime of these

1203
00:43:08,230 --> 00:43:05,359
these pumps is this sooner than expected

1204
00:43:12,550 --> 00:43:11,190
the design life uh was intended to be

1205
00:43:15,270 --> 00:43:12,560
ten years

1206
00:43:17,349 --> 00:43:15,280
uh the mtbf the meantime between

1207
00:43:18,950 --> 00:43:17,359
failures was estimated to be about a

1208
00:43:20,630 --> 00:43:18,960
hundred and a little over a hundred

1209
00:43:22,390 --> 00:43:20,640
thousand hours

1210
00:43:25,430 --> 00:43:22,400
and this one had

1211
00:43:27,589 --> 00:43:25,440
about 50 over 50 probably closer to

1212
00:43:29,510 --> 00:43:27,599
about 58 000 hours

1213
00:43:31,750 --> 00:43:29,520

of run time

1214
00:43:33,670 --> 00:43:31,760
with the pump running

1215
00:43:35,750 --> 00:43:33,680
it's been active

1216
00:43:37,349 --> 00:43:35,760
since it was installed but without the

1217
00:43:39,109 --> 00:43:37,359
pump running so the electronics were

1218
00:43:42,230 --> 00:43:39,119
active

1219
00:43:43,829 --> 00:43:42,240
and that there's about 30 plus 30 30 000

1220
00:43:45,349 --> 00:43:43,839
plus hours so we

1221
00:43:47,589 --> 00:43:45,359
depending on how you look at it there's

1222
00:43:50,630 --> 00:43:47,599
about 80 000 hours worth of time on this

1223
00:43:53,670 --> 00:43:50,640
particular pump and so from an mtbf

1224
00:43:56,550 --> 00:43:53,680
standpoint this is a little bit early

1225
00:43:57,990 --> 00:43:56,560
so so we'll and it's the first failure

1226
00:44:00,470 --> 00:43:58,000
too which is uh

1227
00:44:02,230 --> 00:44:00,480
which is a big driver to figuring out

1228
00:44:04,470 --> 00:44:02,240
how good you're doing on your mtbf

1229
00:44:06,790 --> 00:44:04,480
number so it's a little bit i'd say it's

1230
00:44:09,670 --> 00:44:06,800
early yes from from a failure standpoint

1231
00:44:11,750 --> 00:44:09,680
it's early on a whole from the iss

1232
00:44:15,670 --> 00:44:11,760
standpoint we have been much much much

1233
00:44:20,309 --> 00:44:17,589
than we had

1234
00:44:22,230 --> 00:44:20,319
had expected while you have design lives

1235
00:44:24,390 --> 00:44:22,240
for many many years when you look at

1236
00:44:26,630 --> 00:44:24,400
your mean time between failures your

1237
00:44:28,870 --> 00:44:26,640
spirit you build a sparing philosophy

1238
00:44:31,030 --> 00:44:28,880

based on your mean time between failures

1239
00:44:33,109 --> 00:44:31,040
and life if your design life is less

1240
00:44:34,550 --> 00:44:33,119
than than the design life of the of the

1241
00:44:36,790 --> 00:44:34,560
system

1242
00:44:38,870 --> 00:44:36,800
and so we we spared that way but this is

1243
00:44:40,950 --> 00:44:38,880
a little bit early than we expected on

1244
00:44:42,790 --> 00:44:40,960
the pump

1245
00:44:44,069 --> 00:44:42,800
and if everything goes as planned when

1246
00:44:47,109 --> 00:44:44,079
will the station be back to full

1247
00:44:51,510 --> 00:44:48,790
the team is currently

1248
00:44:53,349 --> 00:44:51,520
working on in addition to the eva and

1249
00:44:54,950 --> 00:44:53,359
the next worst failure

1250
00:44:56,790 --> 00:44:54,960
options or cases

1251
00:44:58,390 --> 00:44:56,800
the team is also starting to talk about

1252
00:45:00,470 --> 00:44:58,400
what the restart

1253
00:45:02,630 --> 00:45:00,480
procedures need to look like so it will

1254
00:45:05,510 --> 00:45:02,640
certainly not be immediately after the

1255
00:45:07,910 --> 00:45:05,520
pump is installed we we hope it will be

1256
00:45:09,829 --> 00:45:07,920
very soon after that but we don't have a

1257
00:45:11,030 --> 00:45:09,839
timeline put together yet for the

1258
00:45:14,470 --> 00:45:11,040
restart

1259
00:45:16,390 --> 00:45:14,480
activities that are going to be required

1260
00:45:18,950 --> 00:45:16,400
thank you

1261
00:45:20,790 --> 00:45:18,960
okay uh that's all the questions from uh

1262
00:45:22,550 --> 00:45:20,800
ken we'll move on to tarik molecular

1263
00:45:24,390 --> 00:45:22,560

space.com

1264
00:45:26,550 --> 00:45:24,400
thank you very much at uh tarik

1265
00:45:28,309 --> 00:45:26,560
malagaspace.com and i have a question

1266
00:45:31,270 --> 00:45:28,319
and a couple follow-ups um courtney you

1267
00:45:33,109 --> 00:45:31,280
mentioned how bulky the

1268
00:45:34,710 --> 00:45:33,119
pump module is and i'm wondering if you

1269
00:45:36,150 --> 00:45:34,720
can kind of compare that to maybe

1270
00:45:37,829 --> 00:45:36,160
pushing a double wide

1271
00:45:39,990 --> 00:45:37,839
fridge is it something kind of on that

1272
00:45:41,349 --> 00:45:40,000
level is it is it bigger than that uh

1273
00:45:43,349 --> 00:45:41,359
dimension wise if you can kind of give

1274
00:45:44,950 --> 00:45:43,359
me a picture that would be great um i'm

1275
00:45:46,390 --> 00:45:44,960
trying to remember from the pictures

1276
00:45:49,030 --> 00:45:46,400
that we've had again i'll look up the

1277
00:45:52,230 --> 00:45:49,040
dimensions uh get you those numbers

1278
00:45:53,750 --> 00:45:52,240
afterwards the um

1279
00:45:55,510 --> 00:45:53,760
when when the crew is holding it it's

1280
00:45:57,910 --> 00:45:55,520
something about about like this big so

1281
00:45:59,190 --> 00:45:57,920
about like three feet across um on the

1282
00:46:00,550 --> 00:45:59,200
side that they're that they're holding

1283
00:46:03,109 --> 00:46:00,560
it so it's probably like three feet by

1284
00:46:05,270 --> 00:46:03,119
six feet somewhere in that in that uh

1285
00:46:07,270 --> 00:46:05,280
ballpark it is very big and it's and

1286
00:46:09,589 --> 00:46:07,280
it's um

1287
00:46:11,430 --> 00:46:09,599
like i said it's unwieldy to to maneuver

1288
00:46:13,670 --> 00:46:11,440

so a lot of the maneuvering is going to

1289
00:46:15,990 --> 00:46:13,680
require a second person either to kind

1290
00:46:19,030 --> 00:46:16,000
of spot and watch where they're going or

1291
00:46:21,430 --> 00:46:19,040
to actually assist with the maneuvering

1292
00:46:23,430 --> 00:46:21,440
so it's it's going to be a tricky

1293
00:46:25,349 --> 00:46:23,440
choreography for the two crew members to

1294
00:46:26,790 --> 00:46:25,359
do

1295
00:46:28,230 --> 00:46:26,800
thanks and

1296
00:46:30,069 --> 00:46:28,240
i was curious also if there's an

1297
00:46:32,710 --> 00:46:30,079
estimated cost for the each the

1298
00:46:35,109 --> 00:46:32,720
individual modules and if if uh if they

1299
00:46:36,550 --> 00:46:35,119
can be sent up on uh other craft beyond

1300
00:46:38,870 --> 00:46:36,560
the shuttle um would you be ordering

1301
00:46:41,109 --> 00:46:38,880
another one to have a full set of spares

1302
00:46:45,270 --> 00:46:41,119
uh in the eventual future

1303
00:46:47,190 --> 00:46:45,280
well there's our planning for for iss as

1304
00:46:49,589 --> 00:46:47,200
i said assumed

1305
00:46:51,589 --> 00:46:49,599
you take the mtbf you take

1306
00:46:55,270 --> 00:46:51,599
you take what you

1307
00:46:58,069 --> 00:46:55,280
decide is the life of the oru based on

1308
00:47:00,950 --> 00:46:58,079
the verification work you did and then

1309
00:47:03,349 --> 00:47:00,960
you spare the program accordingly so our

1310
00:47:05,270 --> 00:47:03,359
analysis said we needed three spares we

1311
00:47:07,430 --> 00:47:05,280
built four for margin

1312
00:47:09,349 --> 00:47:07,440
and and as i said those are all on orbit

1313
00:47:11,270 --> 00:47:09,359

and and we can fly them up on other

1314
00:47:14,069 --> 00:47:11,280
vehicles if we built one with this

1315
00:47:17,670 --> 00:47:14,079
failure where the team is

1316
00:47:22,950 --> 00:47:20,230
should we design a pump that has

1317
00:47:25,190 --> 00:47:22,960
redundant pump motors

1318
00:47:26,870 --> 00:47:25,200
inside and so

1319
00:47:28,390 --> 00:47:26,880
we haven't asked the team to go off and

1320
00:47:30,790 --> 00:47:28,400
build a new pump we do have a

1321
00:47:33,750 --> 00:47:30,800
development pump that is available that

1322
00:47:36,069 --> 00:47:33,760
we probably could do some work on and

1323
00:47:37,270 --> 00:47:36,079
make it available but

1324
00:47:39,829 --> 00:47:37,280
the first thing we're going to do as a

1325
00:47:41,510 --> 00:47:39,839
program is go off and look at the uh

1326
00:47:44,069 --> 00:47:41,520
at a possible redesign that would give

1327
00:47:45,670 --> 00:47:44,079
us redundancy inside the pump

1328
00:47:47,349 --> 00:47:45,680
uh and so that's what we've asked the

1329
00:47:49,190 --> 00:47:47,359
team to go do now we just asked them to

1330
00:47:52,230 --> 00:47:49,200
do that so it'll be a little while

1331
00:47:54,150 --> 00:47:52,240
before we figure out a if we can do it

1332
00:47:55,750 --> 00:47:54,160
uh including getting the redundant power

1333
00:47:57,510 --> 00:47:55,760
then out to the pump

1334
00:47:59,109 --> 00:47:57,520
and then be what the cost would be in

1335
00:48:02,230 --> 00:47:59,119
the schedule things like that but that's

1336
00:48:03,510 --> 00:48:02,240
what we've asked team to go look at

1337
00:48:05,589 --> 00:48:03,520
and is there an estimated cost just for

1338
00:48:07,030 --> 00:48:05,599

these pumps that are on orbit now

1339
00:48:08,710 --> 00:48:07,040
i'm sure there is but i don't know what

1340
00:48:09,589 --> 00:48:08,720
is up top my head we can get that for

1341
00:48:11,589 --> 00:48:09,599
you

1342
00:48:13,270 --> 00:48:11,599
thanks and just my final question then

1343
00:48:14,870 --> 00:48:13,280
you mentioned just the life on board the

1344
00:48:16,870 --> 00:48:14,880
space station and and the jumpers and

1345
00:48:18,630 --> 00:48:16,880
whatnot i'm just curious what it's like

1346
00:48:20,230 --> 00:48:18,640
with with those jumpers in place if it's

1347
00:48:21,190 --> 00:48:20,240
a little bit harder to move around

1348
00:48:23,109 --> 00:48:21,200
inside

1349
00:48:25,109 --> 00:48:23,119
or are they pretty much out of the way

1350
00:48:27,670 --> 00:48:25,119
and it's unaffected thank you

1351
00:48:29,750 --> 00:48:27,680
they're they're certainly not invisible

1352
00:48:31,990 --> 00:48:29,760
uh but they are relatively easy to keep

1353
00:48:33,990 --> 00:48:32,000
out of the way and and uh essentially

1354
00:48:37,270 --> 00:48:34,000
keep you know your activities out of the

1355
00:48:39,829 --> 00:48:37,280
way of them uh so we we haven't uh heard

1356
00:48:41,670 --> 00:48:39,839
any significant impacts to day-to-day

1357
00:48:43,030 --> 00:48:41,680
life from the crew for having those

1358
00:48:44,790 --> 00:48:43,040
there and

1359
00:48:46,470 --> 00:48:44,800
like mike said earlier having those in

1360
00:48:48,950 --> 00:48:46,480
place really gives us the redundancy

1361
00:48:51,670 --> 00:48:48,960
that we need to proceed with eva and

1362
00:48:53,270 --> 00:48:51,680
other critical operations

1363
00:48:54,870 --> 00:48:53,280

thank you

1364
00:48:57,430 --> 00:48:54,880
okay i believe we have one other

1365
00:48:59,510 --> 00:48:57,440
reporter on the line irene klotz

1366
00:49:00,870 --> 00:48:59,520
thanks very much um

1367
00:49:05,670 --> 00:49:00,880
mike do you think that there's going to

1368
00:49:08,790 --> 00:49:05,680
be any impact to the fts 133 flight um

1369
00:49:11,030 --> 00:49:08,800
with having to reschedule the eva that

1370
00:49:13,190 --> 00:49:11,040
was going to be done this week

1371
00:49:14,870 --> 00:49:13,200
i don't know irene i mean it won't

1372
00:49:17,190 --> 00:49:14,880
change the launch date if that's what

1373
00:49:19,270 --> 00:49:17,200
you mean but we we just have to go look

1374
00:49:21,030 --> 00:49:19,280
to see where everything falls out

1375
00:49:22,230 --> 00:49:21,040
and there's quite a bit of time between

1376
00:49:24,630 --> 00:49:22,240
now and then

1377
00:49:26,390 --> 00:49:24,640
if if we feel like something's critical

1378
00:49:27,910 --> 00:49:26,400
it needs to be done then we'll

1379
00:49:29,430 --> 00:49:27,920
before the flight and we can't figure

1380
00:49:30,549 --> 00:49:29,440
out how to do it during the flight then

1381
00:49:34,069 --> 00:49:30,559
we'll

1382
00:49:35,510 --> 00:49:34,079
they before they get there but that's uh

1383
00:49:37,349 --> 00:49:35,520
that is something the team's off looking

1384
00:49:38,230 --> 00:49:37,359
at but i i don't know enough yet to tell

1385
00:49:39,349 --> 00:49:38,240
you

1386
00:49:41,910 --> 00:49:39,359
uh

1387
00:49:43,589 --> 00:49:41,920
how that how that's gonna shake out

1388
00:49:45,349 --> 00:49:43,599

okay thanks and then the other question

1389
00:49:48,069 --> 00:49:45,359
is um

1390
00:49:50,309 --> 00:49:48,079
with uh considering this the failure was

1391
00:49:51,990 --> 00:49:50,319
a little early and um sounds like it's

1392
00:49:55,430 --> 00:49:52,000
kind of unusual if you still have the

1393
00:49:57,910 --> 00:49:55,440
motor um working um how important is it

1394
00:50:00,069 --> 00:49:57,920
to you to try and get this failed pump

1395
00:50:01,829 --> 00:50:00,079
back

1396
00:50:03,990 --> 00:50:01,839
well

1397
00:50:06,390 --> 00:50:04,000
the engineer in me wants all of our

1398
00:50:09,430 --> 00:50:06,400
oru's home the program manager in me

1399
00:50:11,190 --> 00:50:09,440
knows that you can't get them all home

1400
00:50:13,030 --> 00:50:11,200
and even if you brought them all home

1401
00:50:14,549 --> 00:50:13,040
now you probably can't afford to tear

1402
00:50:16,069 --> 00:50:14,559
them all down and

1403
00:50:18,870 --> 00:50:16,079
and figure out what happened to every

1404
00:50:21,430 --> 00:50:18,880
single one of them but

1405
00:50:23,670 --> 00:50:21,440
very much so it'd be it'd be nice to get

1406
00:50:25,349 --> 00:50:23,680
this one home for the reason you stated

1407
00:50:26,390 --> 00:50:25,359
it's a little bit early in its life to

1408
00:50:28,230 --> 00:50:26,400
be failing

1409
00:50:29,829 --> 00:50:28,240
and so to the extent that you can figure

1410
00:50:33,190 --> 00:50:29,839
out what the anomaly is

1411
00:50:35,750 --> 00:50:33,200
and uh and a decide if it has any

1412
00:50:37,750 --> 00:50:35,760
uh significant bearing on your uh on

1413
00:50:39,109 --> 00:50:37,760

your mtbf number and therefore your

1414
00:50:41,030 --> 00:50:39,119
sparing

1415
00:50:42,870 --> 00:50:41,040
needs that would be

1416
00:50:44,230 --> 00:50:42,880
you know great data to have

1417
00:50:46,309 --> 00:50:44,240
for that purpose

1418
00:50:48,790 --> 00:50:46,319
otherwise we'll just work the statistics

1419
00:50:50,309 --> 00:50:48,800
of the failure and and modify our mtbs

1420
00:50:52,470 --> 00:50:50,319
and then look at our sparing associated

1421
00:50:54,230 --> 00:50:52,480
with that probably most importantly

1422
00:50:56,309 --> 00:50:54,240
though is when you can figure out these

1423
00:50:58,069 --> 00:50:56,319
kinds of anomalies you can figure out

1424
00:51:00,230 --> 00:50:58,079
what effect it would have on another on

1425
00:51:02,150 --> 00:51:00,240
that on redesigning that pump but also

1426
00:51:04,230 --> 00:51:02,160
on other systems you have

1427
00:51:06,230 --> 00:51:04,240
uh you know

1428
00:51:08,069 --> 00:51:06,240
designs i won't say are common but we

1429
00:51:09,510 --> 00:51:08,079
use similar techniques in fact we work

1430
00:51:10,950 --> 00:51:09,520
very hard to make sure

1431
00:51:13,589 --> 00:51:10,960
we use similar

1432
00:51:15,349 --> 00:51:13,599
uh processes in the build process to

1433
00:51:17,670 --> 00:51:15,359
make sure we're doing using best

1434
00:51:19,349 --> 00:51:17,680
practices and so if we learn something

1435
00:51:20,870 --> 00:51:19,359
from this you you could have the

1436
00:51:22,870 --> 00:51:20,880
opportunity to look across your entire

1437
00:51:25,109 --> 00:51:22,880
fleet and other things we do

1438
00:51:26,710 --> 00:51:25,119

as an agency to see if we would do them

1439
00:51:28,790 --> 00:51:26,720
different because of the of the

1440
00:51:30,630 --> 00:51:28,800
particular failure so

1441
00:51:31,670 --> 00:51:30,640
we would very much like to get it home

1442
00:51:33,750 --> 00:51:31,680
but

1443
00:51:34,829 --> 00:51:33,760
clearly if we don't get it home

1444
00:51:37,990 --> 00:51:34,839
we know how to

1445
00:51:40,069 --> 00:51:38,000
react okay thank you

1446
00:51:41,829 --> 00:51:40,079
okay let's come back here for a couple

1447
00:51:45,109 --> 00:51:41,839
of follow-up questions at jfc and then

1448
00:51:50,710 --> 00:51:48,150
oh thank you from mark caro for aviation

1449
00:51:52,549 --> 00:51:50,720
week i had two quick ones

1450
00:51:55,270 --> 00:51:52,559
for courtney i think can do you know the

1451
00:51:59,430 --> 00:51:55,280
number of electrical and

1452
00:52:00,950 --> 00:51:59,440
fluid connections involved in this

1453
00:52:03,030 --> 00:52:00,960
on the electrical connections i'm

1454
00:52:04,870 --> 00:52:03,040
thinking it's it's four connections on

1455
00:52:06,790 --> 00:52:04,880
the unit itself i'll need to double

1456
00:52:09,109 --> 00:52:06,800
check that and it is four ammonia

1457
00:52:11,430 --> 00:52:09,119
connections as well

1458
00:52:14,470 --> 00:52:11,440
and will the spare that you use to

1459
00:52:17,589 --> 00:52:14,480
replace is that uh did that come up on

1460
00:52:19,430 --> 00:52:17,599
the in november of

1461
00:52:22,230 --> 00:52:19,440
i 09 i don't remember when this one came

1462
00:52:25,750 --> 00:52:24,390
this is the oldest spare on orbit i'm

1463
00:52:28,710 --> 00:52:25,760

trying to remember which flight it came

1464
00:52:30,549 --> 00:52:28,720
up i think this one came up on 13a

1465
00:52:33,349 --> 00:52:30,559
i can't tell you the date of 13a but i

1466
00:52:34,950 --> 00:52:33,359
think this one came up on 13a

1467
00:52:37,589 --> 00:52:34,960
we can let me confirm that for you mark

1468
00:52:38,950 --> 00:52:37,599
before you set that in stone

1469
00:52:41,349 --> 00:52:38,960
yeah eric berger with the houston

1470
00:52:42,710 --> 00:52:41,359
chronicle just to confirm the one

1471
00:52:45,109 --> 00:52:42,720
module that is currently working was

1472
00:52:46,470 --> 00:52:45,119
that brought up in 2002 as well and has

1473
00:52:52,390 --> 00:52:46,480
the same

1474
00:52:54,069 --> 00:52:52,400
or the s1 and p1 flights flew right

1475
00:52:56,950 --> 00:52:54,079
next to each other and i i don't

1476
00:52:59,270 --> 00:52:56,960
remember exactly when

1477
00:53:01,109 --> 00:52:59,280
we switched them early on to i know that

1478
00:53:03,510 --> 00:53:01,119
i know when this one went up with s1

1479
00:53:05,109 --> 00:53:03,520
because i i checked it was they're right

1480
00:53:06,470 --> 00:53:05,119
there they were the last two flights we

1481
00:53:07,910 --> 00:53:06,480
flew before

1482
00:53:09,030 --> 00:53:07,920
the columbia accident so they were

1483
00:53:10,790 --> 00:53:09,040
within

1484
00:53:12,150 --> 00:53:10,800
a month or two of each other so they're

1485
00:53:13,589 --> 00:53:12,160
similar in age

1486
00:53:15,589 --> 00:53:13,599
and they were turned on at the same time

1487
00:53:18,069 --> 00:53:15,599
well they they're very similar in that

1488
00:53:20,069 --> 00:53:18,079

respect as well they whichever one flew

1489
00:53:21,829 --> 00:53:20,079
first was activated electronically back

1490
00:53:24,470 --> 00:53:21,839
when it was put on orbit they were both

1491
00:53:26,230 --> 00:53:24,480
activated during 128.1 operationally we

1492
00:53:29,510 --> 00:53:26,240
call it so yes similar they have very

1493
00:53:30,710 --> 00:53:29,520
similar lives

1494
00:53:32,230 --> 00:53:30,720
i think that wraps up all of our

1495
00:53:34,790 --> 00:53:32,240
questions here at the johnson space

1496
00:53:36,470 --> 00:53:34,800
center and around the world

1497
00:53:37,829 --> 00:53:36,480
just a reminder a couple of programming

1498
00:53:39,829 --> 00:53:37,839
notes the

1499
00:53:41,990 --> 00:53:39,839
coverage on nasa television of the

1500
00:53:44,150 --> 00:53:42,000
spacewalk assuming it remains scheduled

1501
00:53:46,069 --> 00:53:44,160
for thursday will begin at 5 a.m central

1502
00:53:48,710 --> 00:53:46,079
time on thursday

1503
00:53:50,470 --> 00:53:48,720
and we anticipate having a post eva

1504
00:53:52,069 --> 00:53:50,480
briefing with courtney

1505
00:53:54,390 --> 00:53:52,079
as soon as we can get her off console

1506
00:53:56,390 --> 00:53:54,400
for that no earlier than 2 30 p.m

1507
00:53:57,349 --> 00:53:56,400
central time that day

1508
00:53:59,430 --> 00:53:57,359
also

1509
00:54:00,950 --> 00:53:59,440
today we're going to be uh immediately

1510
00:54:03,510 --> 00:54:00,960
following this briefing playing about 10

1511
00:54:04,790 --> 00:54:03,520
minutes more of that live footage of the

1512
00:54:07,109 --> 00:54:04,800
practice session

1513
00:54:09,109 --> 00:54:07,119

in the neutral buoyancy laboratory where

1514
00:54:10,630 --> 00:54:09,119
a couple of spacewalking

1515
00:54:12,470 --> 00:54:10,640
trainees are going through the motions

1516
00:54:14,790 --> 00:54:12,480
of what will be required of doug

1517
00:54:16,630 --> 00:54:14,800
wheelock and tracy caldwell dyson

1518
00:54:18,230 --> 00:54:16,640
when they set foot out the hatch to go

1519
00:54:21,030 --> 00:54:18,240
do this repair work

1520
00:54:22,790 --> 00:54:21,040
with that we will send you back to the

1521
00:54:24,630 --> 00:54:22,800
nasa tv and the

1522
00:54:26,150 --> 00:54:24,640
eva preparations at the neutral buoyancy

1523
00:54:28,549 --> 00:54:26,160
lab and i look forward to covering the

1524
00:54:30,069 --> 00:54:28,559
spacewalk when it starts on thursday if