
Space Cen
Center

1
00:00:00,000 --> 00:00:05,179
Oh

2
00:00:09,810 --> 00:00:07,140
good morning and welcome to today's

3
00:00:11,490 --> 00:00:09,820
mission status briefing with us today is

4
00:00:13,560 --> 00:00:11,500
quite see Oliver ooh hold the lead

5
00:00:16,500 --> 00:00:13,570
shuttle flight director just coming off

6
00:00:19,500 --> 00:00:16,510
its orbit one shift what's it thank you

7
00:00:21,630 --> 00:00:19,510
well good morning the sts-135 mission

8
00:00:25,020 --> 00:00:21,640
continues to go and absolutely

9
00:00:27,120 --> 00:00:25,030
outstanding fashion our crew is you're

10
00:00:30,900 --> 00:00:27,130
used to hearing now is continuing to

11
00:00:33,229 --> 00:00:30,910
perform incredibly we are running right

12
00:00:35,940 --> 00:00:33,239
about on the timeline with respect to

13
00:00:38,310 --> 00:00:35,950

transfer operations of cargo from the

14
00:00:40,770 --> 00:00:38,320
shuttle mid deck and the MP LM as well

15
00:00:42,150 --> 00:00:40,780
as the transfer return the crew

16
00:00:44,010 --> 00:00:42,160
generally of course has been very

17
00:00:45,810 --> 00:00:44,020
efficient however we've experienced a

18
00:00:47,880 --> 00:00:45,820
couple of minor problems or little

19
00:00:51,510 --> 00:00:47,890
hiccups on along the way which will tell

20
00:00:53,069 --> 00:00:51,520
you about that have used up a little bit

21
00:00:56,190 --> 00:00:53,079
of time but because of their overall

22
00:00:58,020 --> 00:00:56,200
efficiency in their organization and how

23
00:00:59,940 --> 00:00:58,030
well the transfer has been going it's

24
00:01:03,209 --> 00:00:59,950
not going to impact the the mission to

25
00:01:06,480 --> 00:01:03,219
any significant degree right now we are

26
00:01:08,699 --> 00:01:06,490
about seventy percent complete with all

27
00:01:11,010 --> 00:01:08,709
of the transfer that the crew was

28
00:01:12,899 --> 00:01:11,020
timeline to accomplish during this

29
00:01:15,510 --> 00:01:12,909
mission and that's just seventy percent

30
00:01:17,099 --> 00:01:15,520
with respect to the number of items that

31
00:01:18,809 --> 00:01:17,109
they'll lay their hands on that that

32
00:01:20,399 --> 00:01:18,819
doesn't correlate necessarily to the

33
00:01:23,129 --> 00:01:20,409
amount of volume that's been transferred

34
00:01:25,709 --> 00:01:23,139
or the amount of mass but we think that

35
00:01:28,289 --> 00:01:25,719
we think that will be will be at about

36
00:01:29,879 --> 00:01:28,299
seventy percent of the total mass that

37
00:01:32,999 --> 00:01:29,889
we're going to transfer some time

38
00:01:36,120 --> 00:01:33,009

tomorrow in the afternoon today the crew

39
00:01:39,539 --> 00:01:36,130
has got some off-duty time which is very

40
00:01:41,550 --> 00:01:39,549
well-deserved just so they can as not so

41
00:01:43,739 --> 00:01:41,560
much unwind as it were but just throttle

42
00:01:46,440 --> 00:01:43,749
back a bit because they've been working

43
00:01:48,659 --> 00:01:46,450
really hard and of course this off-duty

44
00:01:51,029 --> 00:01:48,669
time is prescribed by our shuttle crew

45
00:01:53,309 --> 00:01:51,039
scheduling constraints in order to

46
00:01:55,859 --> 00:01:53,319
maintain overall fitness and health of

47
00:01:58,469 --> 00:01:55,869
the crew as we proceed with the mission

48
00:02:00,120 --> 00:01:58,479
now many of you have heard by now last

49
00:02:02,489 --> 00:02:00,130
night in the middle of the crews sleep

50
00:02:04,769 --> 00:02:02,499
we had a problem with general purpose

51
00:02:07,469 --> 00:02:04,779
computer number four that's GPC number

52
00:02:09,719 --> 00:02:07,479
four on the shuttle that GPC was

53
00:02:12,900 --> 00:02:09,729
configured as our systems management

54
00:02:15,090 --> 00:02:12,910
machine or sm machine as as we like to

55
00:02:16,020 --> 00:02:15,100
say for short you know how fond we are

56
00:02:18,059 --> 00:02:16,030
of our acronyms

57
00:02:20,730 --> 00:02:18,069
but basically the SM machine what it

58
00:02:23,790 --> 00:02:20,740
does force is some environmental control

59
00:02:26,250 --> 00:02:23,800
it also controls the antennas for our

60
00:02:29,250 --> 00:02:26,260
communication system as well as does

61
00:02:31,710 --> 00:02:29,260
some general fault detection and an

62
00:02:35,059 --> 00:02:31,720
enunciation for the orbiters core

63
00:02:37,800 --> 00:02:35,069

spacecraft systems that computer

64
00:02:40,800 --> 00:02:37,810
returned an error code it basically

65
00:02:42,360 --> 00:02:40,810
failed and in a matter that we call a

66
00:02:46,670 --> 00:02:42,370
fail to quit which essentially means

67
00:02:49,050 --> 00:02:46,680
that it it just stopped and so the

68
00:02:51,750 --> 00:02:49,060
master alarm that was that was

69
00:02:53,670 --> 00:02:51,760
enunciated when that happened right

70
00:02:55,949 --> 00:02:53,680
around two ish hours into the crew sleep

71
00:02:58,890 --> 00:02:55,959
that woke the crew up and they spent

72
00:03:01,680 --> 00:02:58,900
about 30 minutes reconfiguring the

73
00:03:03,660 --> 00:03:01,690
computers to move the systems management

74
00:03:07,740 --> 00:03:03,670
functions to general purpose computer

75
00:03:11,040 --> 00:03:07,750
number to GPC to we then shut off GPC

76
00:03:13,350 --> 00:03:11,050
number 4 and replan today is planned to

77
00:03:15,090 --> 00:03:13,360
to do some detailed troubleshooting on

78
00:03:17,370 --> 00:03:15,100
it we allowed the crew to sleep in about

79
00:03:18,690 --> 00:03:17,380
30 minutes later since we did take about

80
00:03:21,150 --> 00:03:18,700
30 minutes away from their sleep and

81
00:03:22,620 --> 00:03:21,160
they did take us up on that and so once

82
00:03:25,319 --> 00:03:22,630
the crew got going with their day today

83
00:03:28,650 --> 00:03:25,329
commander Chris Ferguson and pilot Doug

84
00:03:31,259 --> 00:03:28,660
Hurley took about 45 minutes to run this

85
00:03:35,190 --> 00:03:31,269
troubleshooting procedure on GPC for to

86
00:03:38,759 --> 00:03:35,200
basically bring it up to do a data dump

87
00:03:42,150 --> 00:03:38,769
of the memory from GPC number one which

88
00:03:45,599 --> 00:03:42,160

was the active primary GNC computer that

89
00:03:48,319 --> 00:03:45,609
saw GP c 4 status when it failed so we

90
00:03:51,479 --> 00:03:48,329
dump that computer's memory we then

91
00:03:53,849 --> 00:03:51,489
initialize GPC for and dumped its memory

92
00:03:56,640 --> 00:03:53,859
to to see what it thought about why it

93
00:03:58,590 --> 00:03:56,650
failed and and then we did an initial

94
00:04:00,810 --> 00:03:58,600
program load essentially ran the exact

95
00:04:04,140 --> 00:04:00,820
same procedure that we ran a few days

96
00:04:08,250 --> 00:04:04,150
ago in response to the the switch T's

97
00:04:11,099 --> 00:04:08,260
failure on GPC 3gp c4 actually did

98
00:04:12,720 --> 00:04:11,109
behave itself it did recover the dumps

99
00:04:14,400 --> 00:04:12,730
were completed nominally and our

100
00:04:16,380 --> 00:04:14,410
engineering teams are analyzing that

101
00:04:19,500 --> 00:04:16,390
dump data right now it will take about

102
00:04:21,270 --> 00:04:19,510
another several hours to get the results

103
00:04:23,100 --> 00:04:21,280
of that dump data we expect a full

104
00:04:25,500 --> 00:04:23,110
report from the engineering teams when

105
00:04:27,600 --> 00:04:25,510
my my flight control team comes on shift

106
00:04:28,410 --> 00:04:27,610
tomorrow or actually really later

107
00:04:31,470 --> 00:04:28,420
tonight

108
00:04:33,450 --> 00:04:31,480
and right now there's no smoking guns

109
00:04:36,450 --> 00:04:33,460
that they've identified as to the cause

110
00:04:38,580 --> 00:04:36,460
of the failure in such a case we treated

111
00:04:40,680 --> 00:04:38,590
is really a transient hardware failure

112
00:04:43,320 --> 00:04:40,690
that might be stimulated by any number

113
00:04:44,760 --> 00:04:43,330

of things you know radiation is one

114
00:04:47,430 --> 00:04:44,770
possible cause but we don't have any

115
00:04:49,890 --> 00:04:47,440
conclusive evidence of that although the

116
00:04:51,270 --> 00:04:49,900
orbiter was as flying through the South

117
00:04:52,710 --> 00:04:51,280
Atlantic anomaly at the time of the

118
00:04:55,410 --> 00:04:52,720
failure so that's just one of the many

119
00:04:57,720 --> 00:04:55,420
things that we think about so once we

120
00:05:00,060 --> 00:04:57,730
brought that computer up we basically

121
00:05:03,780 --> 00:05:00,070
put it to sleep just like we did the GPC

122
00:05:07,710 --> 00:05:03,790
3 and so we're now in a nominal config

123
00:05:10,620 --> 00:05:07,720
again with GP c 1 as our GNC computer

124
00:05:13,130 --> 00:05:10,630
and GPC to which is slightly different

125
00:05:14,670 --> 00:05:13,140
as our systems management computer and

126
00:05:16,620 --> 00:05:14,680
we're going to stay in this

127
00:05:18,720 --> 00:05:16,630
configuration probably for another

128
00:05:22,020 --> 00:05:18,730
couple of shifts another several hours

129
00:05:25,470 --> 00:05:22,030
and think about getting some run time on

130
00:05:26,940 --> 00:05:25,480
GPC for before we undock just to observe

131
00:05:28,950 --> 00:05:26,950
its performance and see if there's any

132
00:05:30,870 --> 00:05:28,960
anything additional that we want to do

133
00:05:34,470 --> 00:05:30,880
with it now once we review the results

134
00:05:36,120 --> 00:05:34,480
of the data dumps and the the memory

135
00:05:37,950 --> 00:05:36,130
analysis that the engineering teams are

136
00:05:40,290 --> 00:05:37,960
doing that still may reveal something

137
00:05:43,170 --> 00:05:40,300
that that leads us to investigate some

138
00:05:44,280 --> 00:05:43,180

some other possible root causes and to

139
00:05:46,200 --> 00:05:44,290
think about some other things that we

140
00:05:48,360 --> 00:05:46,210
might want to do with the computer but

141
00:05:50,370 --> 00:05:48,370
for the time being we've got we've got

142
00:05:52,080 --> 00:05:50,380
it recovered and we think it will

143
00:05:53,840 --> 00:05:52,090
probably continue to function well for

144
00:05:57,480 --> 00:05:53,850
us for the duration of the mission the

145
00:06:01,260 --> 00:05:57,490
other little anomaly that you might hear

146
00:06:03,450 --> 00:06:01,270
about shortly is a broken latch on a

147
00:06:05,610 --> 00:06:03,460
locker door where we store our lithium

148
00:06:08,490 --> 00:06:05,620
hydroxide canisters these canisters are

149
00:06:10,890 --> 00:06:08,500
our co2 scrubbers on the orbiter we

150
00:06:13,050 --> 00:06:10,900
don't need them right now for the co2

151
00:06:15,690 --> 00:06:13,060
control on the shuttle because the

152
00:06:17,580 --> 00:06:15,700
regenerative co2 removal systems on the

153
00:06:18,720 --> 00:06:17,590
International Space Station are

154
00:06:21,660 --> 00:06:18,730
providing more than sufficient

155
00:06:24,390 --> 00:06:21,670
capability to control co2 but we were

156
00:06:27,390 --> 00:06:24,400
scheduled to get into that that liyo

157
00:06:29,490 --> 00:06:27,400
locker if you will to to change out some

158
00:06:31,380 --> 00:06:29,500
of the canisters that are on the space

159
00:06:33,600 --> 00:06:31,390
station older canisters with the fresh

160
00:06:35,610 --> 00:06:33,610
canisters that we flew up on on Atlantis

161
00:06:37,110 --> 00:06:35,620
that's the standard procedure that we

162
00:06:38,220 --> 00:06:37,120
typically do during these missions in

163
00:06:40,110 --> 00:06:38,230

order to make sure that the

164
00:06:41,679 --> 00:06:40,120
International Space Station has the the

165
00:06:44,859 --> 00:06:41,689
freshest canisters that

166
00:06:47,739 --> 00:06:44,869
that are possible and and so we will

167
00:06:49,179 --> 00:06:47,749
have to probably do some kind of some

168
00:06:50,799 --> 00:06:49,189
kind of maintenance activity on that

169
00:06:53,139 --> 00:06:50,809
locker to get it get it open at a

170
00:06:55,749 --> 00:06:53,149
convenient time might get to do that

171
00:06:58,539 --> 00:06:55,759
sometime today maybe sometime tomorrow

172
00:06:59,679 --> 00:06:58,549
but other than those things again

173
00:07:02,529 --> 00:06:59,689
Atlantis continues to perform

174
00:07:04,209 --> 00:07:02,539
beautifully the transformation is going

175
00:07:06,609 --> 00:07:04,219
very well we haven't experienced any

176
00:07:07,899 --> 00:07:06,619
other significant problems with the

177
00:07:10,539 --> 00:07:07,909
spacecraft and of course we're going to

178
00:07:11,499 --> 00:07:10,549
continue to watch the computers and and

179
00:07:14,019 --> 00:07:11,509
make sure that they behave themselves

180
00:07:16,929 --> 00:07:14,029
but right now we think we are very much

181
00:07:19,239 --> 00:07:16,939
on a path where we will likely be able

182
00:07:23,979 --> 00:07:19,249
to configure the computers nominally for

183
00:07:25,959 --> 00:07:23,989
entry and landing on on flight day 13 so

184
00:07:29,019 --> 00:07:25,969
that's the status that we've got right

185
00:07:33,850 --> 00:07:29,029
now tomorrow we have on the plate more

186
00:07:36,219 --> 00:07:33,860
transfer so again repetition of pretty

187
00:07:39,339 --> 00:07:36,229
much the same theme with very little

188
00:07:41,499 --> 00:07:39,349

variation cargo transfer cargo transfer

189
00:07:44,049 --> 00:07:41,509
and more cargo transfer but again that's

190
00:07:45,729 --> 00:07:44,059
the reason that this the spacecraft is

191
00:07:48,579 --> 00:07:45,739
docked and that part of the mission is

192
00:07:51,429 --> 00:07:48,589
going very very well this point I'll

193
00:07:52,989 --> 00:07:51,439
turn back to you Thank You Kwazii we'll

194
00:07:54,909 --> 00:07:52,999
take questions now starting here at

195
00:07:56,709 --> 00:07:54,919
Johnson Space Center please remember to

196
00:07:59,290 --> 00:07:56,719
step to the mic to ask a question and

197
00:08:03,489 --> 00:07:59,300
please remember to identify yourself by

198
00:08:06,629 --> 00:08:03,499
name and affiliation thanks son all

199
00:08:09,179 --> 00:08:06,639
right so Marco for aviation week and

200
00:08:12,309 --> 00:08:09,189
could you go over with the nominal

201
00:08:16,359 --> 00:08:12,319
configuration for the g pcs would would

202
00:08:18,489 --> 00:08:16,369
be for landing and also it doesn't look

203
00:08:21,669 --> 00:08:18,499
like there's any common thread between

204
00:08:24,729 --> 00:08:21,679
three and four at this point but just to

205
00:08:27,729 --> 00:08:24,739
be sure do you consider three available

206
00:08:29,439 --> 00:08:27,739
for anything you need it to do ok for

207
00:08:32,019 --> 00:08:29,449
the rest of the mission at landing great

208
00:08:34,299 --> 00:08:32,029
questions first off let me ask let me

209
00:08:36,459 --> 00:08:34,309
answer the shorter the shorter shorter

210
00:08:38,829 --> 00:08:36,469
question answer and that is about GPC

211
00:08:41,290 --> 00:08:38,839
three right now we consider GPC three a

212
00:08:43,329 --> 00:08:41,300
perfectly healthy and functional GPC

213
00:08:46,030 --> 00:08:43,339

that is available for use for whatever

214
00:08:47,980 --> 00:08:46,040
we might need to use it for typically we

215
00:08:49,870 --> 00:08:47,990
will use it as a

216
00:08:52,269 --> 00:08:49,880
a guidance navigation control computer

217
00:08:54,400 --> 00:08:52,279
and we don't see any liens against doing

218
00:08:57,570 --> 00:08:54,410
that at this time now the nominal

219
00:09:01,300 --> 00:08:57,580
configuration of the the GPC s4 entry

220
00:09:04,900 --> 00:09:01,310
essentially we will not only have all 5g

221
00:09:06,639 --> 00:09:04,910
pcs up G pcs 1 through 4 run what we

222
00:09:10,150 --> 00:09:06,649
call our past software basically our

223
00:09:12,550 --> 00:09:10,160
primary avionics system software and and

224
00:09:15,070 --> 00:09:12,560
they run redundant copies of that

225
00:09:17,199 --> 00:09:15,080
software so that they are all computing

226
00:09:18,940 --> 00:09:17,209
the same thing and talking to each other

227
00:09:22,000 --> 00:09:18,950
so that they can check each other out

228
00:09:24,250 --> 00:09:22,010
and make sure that all of the computers

229
00:09:25,960 --> 00:09:24,260
are functioning properly and computing

230
00:09:27,940 --> 00:09:25,970
the same result given the same inputs

231
00:09:32,110 --> 00:09:27,950
that they derive from their flight

232
00:09:35,470 --> 00:09:32,120
critical buses GPC 5 which is also up

233
00:09:37,960 --> 00:09:35,480
and running for landing performs the

234
00:09:40,150 --> 00:09:37,970
exact same functions except with a

235
00:09:41,920 --> 00:09:40,160
completely different flight software

236
00:09:43,840 --> 00:09:41,930
package that's made by a different

237
00:09:46,060 --> 00:09:43,850
vendor and so this provides us some

238
00:09:48,730 --> 00:09:46,070

redundancy and protection against any

239
00:09:51,610 --> 00:09:48,740
insidious software issues that might

240
00:09:55,650 --> 00:09:51,620
conceivably take down all four pass G

241
00:09:58,990 --> 00:09:55,660
pcs given given some some anomalies or

242
00:10:00,389 --> 00:09:59,000
singularities and computation / 0 errors

243
00:10:03,370 --> 00:10:00,399
or something something something

244
00:10:05,560 --> 00:10:03,380
insidious like that and so normally all

245
00:10:07,180 --> 00:10:05,570
five of those computers are up the way

246
00:10:11,650 --> 00:10:07,190
we configure the computers is we assign

247
00:10:13,870 --> 00:10:11,660
each computer to talk and to drive if

248
00:10:16,569 --> 00:10:13,880
you will one of the flight critical

249
00:10:20,199 --> 00:10:16,579
buses a bus is just simply a collection

250
00:10:24,370 --> 00:10:20,209
of input/output devices that link the

251
00:10:27,220 --> 00:10:24,380
computer to physical pumps valves flight

252
00:10:29,920 --> 00:10:27,230
control surfaces thrusters Jets engines

253
00:10:32,860 --> 00:10:29,930
and other things that are required to to

254
00:10:35,350 --> 00:10:32,870
fly Atlantis and so we have for flight

255
00:10:37,510 --> 00:10:35,360
criticals for flight critical strings

256
00:10:41,079 --> 00:10:37,520
for flight critical buses and we assign

257
00:10:45,100 --> 00:10:41,089
J pcs 1 through 4 to the buses 1 through

258
00:10:47,889 --> 00:10:45,110
4 respectively GPC five runs the backup

259
00:10:50,889 --> 00:10:47,899
flight software and again provides some

260
00:10:54,430 --> 00:10:50,899
redundancy as far as the software part

261
00:10:55,930 --> 00:10:54,440
of the the computer management and all

262
00:10:57,760 --> 00:10:55,940
five of those computers will be up for

263
00:11:00,050 --> 00:10:57,770

entry and

264
00:11:04,940 --> 00:11:00,060
ideally we won't have any additional

265
00:11:07,100 --> 00:11:04,950
problems or failures Philips loss with

266
00:11:09,950 --> 00:11:07,110
NASA Space Flight calm a couple

267
00:11:12,080 --> 00:11:09,960
questions first did you see any kind of

268
00:11:14,300 --> 00:11:12,090
the failure signature well not your

269
00:11:16,190 --> 00:11:14,310
shift but the orbit three shift did they

270
00:11:20,270 --> 00:11:16,200
see any kind of a signature at the time

271
00:11:22,810 --> 00:11:20,280
of failure for GPC for are you asking if

272
00:11:25,850 --> 00:11:22,820
there was some kind of telemetry or

273
00:11:28,130 --> 00:11:25,860
leading indicator before the the MDM

274
00:11:29,930 --> 00:11:28,140
fail are the GBC fail yeah or like it

275
00:11:31,850 --> 00:11:29,940
was there any errors or anything like

276
00:11:33,980 --> 00:11:31,860
that or seen at the time or to just fail

277
00:11:36,170 --> 00:11:33,990
to quit there was nothing that was seen

278
00:11:38,750 --> 00:11:36,180
in telemetry for that computer at the

279
00:11:40,820 --> 00:11:38,760
time it just failed to quit happened

280
00:11:42,710 --> 00:11:40,830
happened pretty much right out of the

281
00:11:45,980 --> 00:11:42,720
blue flight control team responded per

282
00:11:48,380 --> 00:11:45,990
procedure and and reconfigured of course

283
00:11:50,720 --> 00:11:48,390
our initial indication was the master

284
00:11:53,330 --> 00:11:50,730
alarm that we saw in telemetry that when

285
00:11:56,920 --> 00:11:53,340
the system failed in several of our

286
00:11:59,180 --> 00:11:56,930
flight controllers of course reported

287
00:12:00,860 --> 00:11:59,190
indications that they would see as a

288
00:12:05,000 --> 00:12:00,870

result of losing the systems management

289
00:12:07,220 --> 00:12:05,010
function on that GPC and then the

290
00:12:08,660 --> 00:12:07,230
frequency of this type of a failure is

291
00:12:11,660 --> 00:12:08,670
this something that has been seen before

292
00:12:13,730 --> 00:12:11,670
and if so how frequently it has a been

293
00:12:16,310 --> 00:12:13,740
seen Justin you know the recent past

294
00:12:18,940 --> 00:12:16,320
well this this type of a failure is

295
00:12:21,980 --> 00:12:18,950
actually very infrequent this is the

296
00:12:24,260 --> 00:12:21,990
really only the second bonafide

297
00:12:27,830 --> 00:12:24,270
in-flight anomaly that we have had of

298
00:12:30,740 --> 00:12:27,840
this particular design of GPC we've

299
00:12:33,110 --> 00:12:30,750
we've had two designs of GPC and the

300
00:12:35,390 --> 00:12:33,120
shuttle program you may have heard last

301
00:12:37,400 --> 00:12:35,400
time we talked about computers mr.

302
00:12:39,280 --> 00:12:37,410
Harwood I think I mentioned that we had

303
00:12:42,800 --> 00:12:39,290
a number of computer failures on sts9

304
00:12:45,740 --> 00:12:42,810
that that designer model of

305
00:12:48,680 --> 00:12:45,750
general-purpose computer was was phased

306
00:12:51,710 --> 00:12:48,690
out some years ago and so the the

307
00:12:53,390 --> 00:12:51,720
current model of GPC that's in use has

308
00:12:55,670 --> 00:12:53,400
only experienced one other anomaly like

309
00:12:57,490 --> 00:12:55,680
this and that was on sds 71 back in

310
00:13:00,050 --> 00:12:57,500
summer of nineteen ninety-five and

311
00:13:03,560 --> 00:13:00,060
interestingly enough it was also on

312
00:13:06,950 --> 00:13:03,570
Atlantis and also on GPC for now that's

313
00:13:09,440 --> 00:13:06,960

the slot that the the GPC was in when it

314
00:13:10,040 --> 00:13:09,450
failed the actual physical serial number

315
00:13:13,160 --> 00:13:10,050
you

316
00:13:14,900 --> 00:13:13,170
and hardware is not the same it's not

317
00:13:19,340 --> 00:13:14,910
physically the same computer that was on

318
00:13:20,840 --> 00:13:19,350
Atlantis back in on sds 71 but basically

319
00:13:22,460 --> 00:13:20,850
that's the only other other failure

320
00:13:29,660 --> 00:13:22,470
we've had from this series of computer

321
00:13:32,300 --> 00:13:29,670
in orbit traditional questions Robert hi

322
00:13:35,810 --> 00:13:32,310
Robert Freeman with collectspace.com on

323
00:13:37,490 --> 00:13:35,820
the stuck latch on the locker you

324
00:13:39,079 --> 00:13:37,500
mentioned maintenance can you qualify

325
00:13:41,690 --> 00:13:39,089
that a little bit is it pulling out a

326
00:13:44,990 --> 00:13:41,700
pry bar and trying to get yourself into

327
00:13:48,019 --> 00:13:45,000
that mechanically or is it unscrewing

328
00:13:51,290 --> 00:13:48,029
the the door how is that done okay great

329
00:13:53,540 --> 00:13:51,300
question the particular Locker in

330
00:13:57,620 --> 00:13:53,550
question has an access door on it

331
00:14:01,579 --> 00:13:57,630
however the entire panel on which that

332
00:14:04,000 --> 00:14:01,589
door is situated and attached is

333
00:14:06,650 --> 00:14:04,010
fastened to the floor with about 25

334
00:14:08,870 --> 00:14:06,660
captive fasteners and so essentially we

335
00:14:10,670 --> 00:14:08,880
just essentially have to go to the the

336
00:14:13,220 --> 00:14:10,680
edges of that whole panel after we

337
00:14:15,440 --> 00:14:13,230
remove the cargo and various other

338
00:14:19,490 --> 00:14:15,450

things that are stowed there from from

339
00:14:20,870 --> 00:14:19,500
the area and just unhinge a nun loosen

340
00:14:23,569 --> 00:14:20,880
those fasteners and then we can remove

341
00:14:25,280 --> 00:14:23,579
the whole panel and get to the back side

342
00:14:26,690 --> 00:14:25,290
of that door with the with the stuck

343
00:14:30,610 --> 00:14:26,700
latch and then we should be able to

344
00:14:32,750 --> 00:14:30,620
remediated fairly quickly by resetting a

345
00:14:35,690 --> 00:14:32,760
set screw which we think is probably

346
00:14:39,050 --> 00:14:35,700
come loose or maybe trying to address a

347
00:14:42,889 --> 00:14:39,060
failed spring of some kind bidding

348
00:14:44,510 --> 00:14:42,899
Denise Chow space calm with the GPC 3

349
00:14:47,449 --> 00:14:44,520
how confident are you that you won't

350
00:14:50,510 --> 00:14:47,459
have another switch teased or related

351
00:14:53,420 --> 00:14:50,520
incident during reentry ok great

352
00:14:55,939 --> 00:14:53,430
question well we're going to we're going

353
00:14:59,060 --> 00:14:55,949
to basically see where we are with that

354
00:15:01,910 --> 00:14:59,070
GPC when we we bring it up for undock

355
00:15:03,530 --> 00:15:01,920
and fly around in a few days now one of

356
00:15:05,990 --> 00:15:03,540
the things about the switch T's

357
00:15:08,210 --> 00:15:06,000
phenomenon is it's it's really a feature

358
00:15:10,860 --> 00:15:08,220
of the switch it's something that we

359
00:15:13,440 --> 00:15:10,870
cover in training and and

360
00:15:16,890 --> 00:15:13,450
you know when I went through my initial

361
00:15:19,530 --> 00:15:16,900
data processing system training a few

362
00:15:22,230 --> 00:15:19,540
years ago and I first tried to expand

363
00:15:23,730 --> 00:15:22,240

expand to set and power up g pcs I did

364
00:15:25,440 --> 00:15:23,740
the exact same thing it's something that

365
00:15:27,240 --> 00:15:25,450
that can sort of happen if you're not

366
00:15:29,190 --> 00:15:27,250
really paying attention it's it's the

367
00:15:32,190 --> 00:15:29,200
technique for avoiding switch T's is

368
00:15:34,290 --> 00:15:32,200
actually very easy to implement so we

369
00:15:37,260 --> 00:15:34,300
are pretty confident we won't have the

370
00:15:39,870 --> 00:15:37,270
have the problem again if we do however

371
00:15:42,120 --> 00:15:39,880
we do know how to bring that bring that

372
00:15:44,010 --> 00:15:42,130
computer backup will be on the lookout

373
00:15:47,550 --> 00:15:44,020
and ready to implement the procedures

374
00:15:49,590 --> 00:15:47,560
that are required to to reinitialize the

375
00:15:53,400 --> 00:15:49,600
the computer within a reasonable amount

376
00:15:56,280 --> 00:15:53,410
of time and so we should have plenty of

377
00:15:59,040 --> 00:15:56,290
time to get the computers in proper

378
00:16:04,440 --> 00:15:59,050
configuration prior to execution of the

379
00:16:07,050 --> 00:16:04,450
deorbit burn for entry ok Irene Klotz

380
00:16:09,090 --> 00:16:07,060
with Reuters um to computer glitches on

381
00:16:11,300 --> 00:16:09,100
one flight seems pretty high odds

382
00:16:20,790 --> 00:16:11,310
somehow do you know they're not related

383
00:16:23,610 --> 00:16:20,800
well the for the GPC three case when

384
00:16:25,290 --> 00:16:23,620
that MDM or excuse me I MDM is what we

385
00:16:28,560 --> 00:16:25,300
call him on the space station sign when

386
00:16:30,630 --> 00:16:28,570
that computer failed it failed at the

387
00:16:33,720 --> 00:16:30,640
moment the crew was actuated the switch

388
00:16:36,390 --> 00:16:33,730

we got feedback from the crew about

389
00:16:39,300 --> 00:16:36,400
about what had happened the signature

390
00:16:41,130 --> 00:16:39,310
was consistent with the ops notes that

391
00:16:44,579 --> 00:16:41,140
we have consistent with the switch tease

392
00:16:47,150 --> 00:16:44,589
in this case the crew was asleep nobody

393
00:16:50,880 --> 00:16:47,160
was anywhere near the switches and so

394
00:16:54,090 --> 00:16:50,890
this this signature and the circumstance

395
00:16:56,970 --> 00:16:54,100
was different now to be sure as I said

396
00:17:00,120 --> 00:16:56,980
earlier until we complete our analysis

397
00:17:02,910 --> 00:17:00,130
of the dump data we have no idea exactly

398
00:17:05,520 --> 00:17:02,920
what caused the the failure of GPC for

399
00:17:07,439 --> 00:17:05,530
the fact that GPC for was able to be

400
00:17:10,740 --> 00:17:07,449
reinitialized is very telling because

401
00:17:13,949 --> 00:17:10,750
what it says is that whatever the issue

402
00:17:15,689 --> 00:17:13,959
was it's either software or a transient

403
00:17:18,210 --> 00:17:15,699
hardware issue and of course transient

404
00:17:20,220 --> 00:17:18,220
hardware issues tend to fall in fairly

405
00:17:22,590 --> 00:17:20,230
limited subset of things that you that

406
00:17:23,730 --> 00:17:22,600
you'd look for things like radiation or

407
00:17:25,559 --> 00:17:23,740
some kind of

408
00:17:27,960 --> 00:17:25,569
chuckle anomaly that we can that we

409
00:17:29,750 --> 00:17:27,970
could go investigate so we've got

410
00:17:33,810 --> 00:17:29,760
different circumstances different

411
00:17:36,690 --> 00:17:33,820
signatures the fail condition on GPC 3

412
00:17:39,290 --> 00:17:36,700
wuzz wuzz wuzz wuzz different GPC 3

413
00:17:41,820 --> 00:17:39,300

actually failed to halt whereas this

414
00:17:44,970 --> 00:17:41,830
computer failed to quit which is two

415
00:17:49,680 --> 00:17:44,980
different computational and and physical

416
00:17:51,210 --> 00:17:49,690
states of the hardware so until you

417
00:17:53,190 --> 00:17:51,220
complete your analysis you can't really

418
00:17:54,870 --> 00:17:53,200
say anything for sure but we've got many

419
00:17:56,790 --> 00:17:54,880
reasons to believe that that these two

420
00:17:59,220 --> 00:17:56,800
failures are not caused by the same

421
00:18:03,240 --> 00:17:59,230
thing now the fact that we did have two

422
00:18:05,040 --> 00:18:03,250
computer failures on the same flight on

423
00:18:07,830 --> 00:18:05,050
a spacecraft that's otherwise performing

424
00:18:10,590 --> 00:18:07,840
beautifully that's not at all lost on me

425
00:18:12,840 --> 00:18:10,600
I do have a saying that you're not

426
00:18:15,480 --> 00:18:12,850
paranoid if if they really are after you

427
00:18:18,090 --> 00:18:15,490
so I am cautiously optimistic that we'll

428
00:18:20,400 --> 00:18:18,100
have a healthy data processing system

429
00:18:23,580 --> 00:18:20,410
for undocking for the rest of the

430
00:18:26,669 --> 00:18:23,590
mission and for re-entry but we will be

431
00:18:30,240 --> 00:18:26,679
watching closely any other questions

432
00:18:32,910 --> 00:18:30,250
here in Houston good John 13 here in

433
00:18:35,010 --> 00:18:32,920
town the during the the crew briefing we

434
00:18:36,930 --> 00:18:35,020
heard that one of the station members

435
00:18:38,460 --> 00:18:36,940
say this thing started look smaller can

436
00:18:40,980 --> 00:18:38,470
you explain where they're putting all

437
00:18:43,040 --> 00:18:40,990
this stuff and it you know why would the

438
00:18:46,410 --> 00:18:43,050

station seem smaller in his estimation

439
00:18:48,450 --> 00:18:46,420
okay that's an excellent question the

440
00:18:52,980 --> 00:18:48,460
station is is starting to seem smaller

441
00:18:55,890 --> 00:18:52,990
because we have brought up in the npl m

442
00:18:58,410 --> 00:18:55,900
and in the mid-deck an incredible amount

443
00:19:02,820 --> 00:18:58,420
of stuff of course that's a technical

444
00:19:05,460 --> 00:19:02,830
term there's just so much cargo and in

445
00:19:07,110 --> 00:19:05,470
so many large bags that that have been

446
00:19:10,260 --> 00:19:07,120
brought up now is there being unloaded

447
00:19:12,930 --> 00:19:10,270
from the MPL em they are being stowed in

448
00:19:14,280 --> 00:19:12,940
the livable spaces on board the

449
00:19:17,280 --> 00:19:14,290
International Space Station they're

450
00:19:19,799 --> 00:19:17,290
being stowed in the lab module in node 1

451
00:19:22,049 --> 00:19:19,809
no 2 in the gym wherever we can

452
00:19:24,360 --> 00:19:22,059
reasonably put them in the the pmm the

453
00:19:26,400 --> 00:19:24,370
pressurized multi-purpose module and so

454
00:19:29,100 --> 00:19:26,410
as all these cargoes being deployed in

455
00:19:31,380 --> 00:19:29,110
addition to the supplies the provisions

456
00:19:32,930 --> 00:19:31,390
and and spare parts and other cargo that

457
00:19:35,220 --> 00:19:32,940
was already on the on the space station

458
00:19:37,080 --> 00:19:35,230
there are certain portions of the space

459
00:19:38,550 --> 00:19:37,090
station certain modules certain

460
00:19:41,520 --> 00:19:38,560
habitable volumes which which quite

461
00:19:45,090 --> 00:19:41,530
honestly get cramped that is that is a

462
00:19:48,480 --> 00:19:45,100
price that we are paying for bringing up

463
00:19:51,270 --> 00:19:48,490

these supplies but as the orbiter leaves

464
00:19:55,050 --> 00:19:51,280
and the crew resident on the space

465
00:19:59,070 --> 00:19:55,060
station is able to leverage and manage

466
00:20:01,260 --> 00:19:59,080
that cargo to be placed more efficiently

467
00:20:04,980 --> 00:20:01,270
and to be placed according to their

468
00:20:09,510 --> 00:20:04,990
priority of need for ongoing undocked

469
00:20:11,340 --> 00:20:09,520
operations things will level out more as

470
00:20:13,530 --> 00:20:11,350
the visiting vehicles that are coming up

471
00:20:16,770 --> 00:20:13,540
over the next several months come up and

472
00:20:18,870 --> 00:20:16,780
we dispose of foam in those visiting

473
00:20:20,310 --> 00:20:18,880
vehicles as trash that's going to help a

474
00:20:22,440 --> 00:20:20,320
lot one of the things you have to

475
00:20:24,420 --> 00:20:22,450
understand is that with the cargo that

476
00:20:27,990 --> 00:20:24,430
we've brought up in order to make sure

477
00:20:30,990 --> 00:20:28,000
that it survives intact it's riot on on

478
00:20:33,330 --> 00:20:31,000
the space shuttle it's packed in a great

479
00:20:36,420 --> 00:20:33,340
deal of foam in fact much of the volume

480
00:20:38,190 --> 00:20:36,430
that is taken up by this cargo is it's

481
00:20:40,890 --> 00:20:38,200
packing foam designed to protect it and

482
00:20:42,390 --> 00:20:40,900
so once it's on orbit and once the foam

483
00:20:45,090 --> 00:20:42,400
is no longer needed that really

484
00:20:47,610 --> 00:20:45,100
represents a bit of a nuisance more than

485
00:20:49,560 --> 00:20:47,620
anything and so will try to pack as much

486
00:20:52,980 --> 00:20:49,570
of that phone as possible in the MPL m4

487
00:20:55,620 --> 00:20:52,990
return so hopefully the the spacecraft

488
00:20:56,850 --> 00:20:55,630

will seem a bit less cramped in a few

489
00:20:58,980 --> 00:20:56,860
days when we get ready to close out the

490
00:21:01,980 --> 00:20:58,990
MPL m and of course there's just a

491
00:21:03,870 --> 00:21:01,990
natural an actual situation where

492
00:21:05,640 --> 00:21:03,880
there's other pieces of foam and other

493
00:21:08,130 --> 00:21:05,650
packing material that we just won't be

494
00:21:10,050 --> 00:21:08,140
able to dispose of until much later say

495
00:21:12,750 --> 00:21:10,060
on a progress vehicle or or one of the

496
00:21:15,360 --> 00:21:12,760
other visiting vehicles that come okay

497
00:21:18,830 --> 00:21:15,370
anybody else here at JSC will take

498
00:21:21,450 --> 00:21:18,840
questions now from Kennedy Space in it

499
00:21:25,500 --> 00:21:21,460
hi Marcia Dunn Associated Press with a

500
00:21:27,510 --> 00:21:25,510
couple questions for GPC three you

501
00:21:29,640 --> 00:21:27,520
described it as Phil to halt i believe i

502
00:21:31,170 --> 00:21:29,650
don't i'm not quite sure exactly what

503
00:21:33,420 --> 00:21:31,180
that means what is that also an

504
00:21:35,640 --> 00:21:33,430
immediate shutdown and how many times

505
00:21:40,170 --> 00:21:35,650
have you seen that type of occurrence on

506
00:21:42,030 --> 00:21:40,180
orbit before ok in in the in the event

507
00:21:43,680 --> 00:21:42,040
of a failed to halt basically what

508
00:21:48,150 --> 00:21:43,690
that's saying is you know we have a mode

509
00:21:49,800 --> 00:21:48,160
switch that tells the GPC if we if we

510
00:21:53,310 --> 00:21:49,810
switch it to that position tell us that

511
00:21:57,000 --> 00:21:53,320
PC to halt which essentially means to to

512
00:21:58,890 --> 00:21:57,010
stop computing it doesn't flush it or

513
00:22:02,160 --> 00:21:58,900

purge it of its if its software doesn't

514
00:22:04,620 --> 00:22:02,170
register necessarily any errors in the

515
00:22:06,390 --> 00:22:04,630
box itself but it just stops I like to

516
00:22:08,850 --> 00:22:06,400
think of it in layman's terms is

517
00:22:11,880 --> 00:22:08,860
analogous to win you simply close the

518
00:22:14,310 --> 00:22:11,890
lid on your laptop your laptop is still

519
00:22:16,620 --> 00:22:14,320
is really asleep the operating system is

520
00:22:19,470 --> 00:22:16,630
still active in some small part of the

521
00:22:21,810 --> 00:22:19,480
the computer's memory if you open the

522
00:22:23,460 --> 00:22:21,820
lid on your laptop you'll essentially be

523
00:22:25,170 --> 00:22:23,470
able to resume your session exactly

524
00:22:27,180 --> 00:22:25,180
where you left off that's the way you

525
00:22:29,460 --> 00:22:27,190
should think about the halt state in the

526
00:22:32,190 --> 00:22:29,470
case of failed to quit the application

527
00:22:34,080 --> 00:22:32,200
software that's in the the computer as

528
00:22:37,470 --> 00:22:34,090
well as the operating system it just

529
00:22:40,080 --> 00:22:37,480
stopped computation stopped all of the

530
00:22:43,440 --> 00:22:40,090
processes just simply stopped in an

531
00:22:46,380 --> 00:22:43,450
otherwise unrecoverable manner and of

532
00:22:49,320 --> 00:22:46,390
course we buy a necessity did have to do

533
00:22:52,050 --> 00:22:49,330
a data dump and we initialize we

534
00:22:55,110 --> 00:22:52,060
initialize that computer now as I

535
00:22:57,240 --> 00:22:55,120
indicated before the the only other

536
00:22:59,040 --> 00:22:57,250
instance of a spontaneous on-orbit

537
00:23:02,810 --> 00:22:59,050
anomaly that we've seen like what we had

538
00:23:06,120 --> 00:23:02,820

on GPC for was on sds 71 as far as the

539
00:23:07,530 --> 00:23:06,130
the the issue we had with GPC three the

540
00:23:09,180 --> 00:23:07,540
sort of the switch T's phenomenon I

541
00:23:10,740 --> 00:23:09,190
don't have exact numbers but i know we

542
00:23:12,570 --> 00:23:10,750
have we've seen that in orbit a few

543
00:23:14,310 --> 00:23:12,580
times as i said it's a feature of the

544
00:23:16,200 --> 00:23:14,320
switch and and if you don't finesse it

545
00:23:20,430 --> 00:23:16,210
quite the right way you're prone to get

546
00:23:23,430 --> 00:23:20,440
that situation thank you and i'm

547
00:23:26,490 --> 00:23:23,440
wondering what happens if one of the

548
00:23:28,350 --> 00:23:26,500
other three gb see also experienced some

549
00:23:31,350 --> 00:23:28,360
sort of quit to halt quit to quit to

550
00:23:33,060 --> 00:23:31,360
quit what happens then and is there

551
00:23:35,520 --> 00:23:33,070
anything that you could think of that

552
00:23:38,100 --> 00:23:35,530
might come back from this analysis that

553
00:23:42,270 --> 00:23:38,110
would prompt you to consider an early

554
00:23:45,300 --> 00:23:42,280
return well according to our flight

555
00:23:48,690 --> 00:23:45,310
rules we would have mission duration

556
00:23:51,870 --> 00:23:48,700
impacts if I if I lost more than if I

557
00:23:54,090 --> 00:23:51,880
lost two computers essentially then we

558
00:23:56,910 --> 00:23:54,100
would attenuate the mission into what we

559
00:23:59,910 --> 00:23:56,920
call an MDF for minimum duration flight

560
00:24:02,610 --> 00:23:59,920
if I lost three computers then according

561
00:24:03,950 --> 00:24:02,620
to my rules I would be looking at

562
00:24:05,970 --> 00:24:03,960
coming home essentially at my next

563
00:24:08,370 --> 00:24:05,980

primary landing site which would be

564
00:24:10,500 --> 00:24:08,380
essentially within within the day so as

565
00:24:14,070 --> 00:24:10,510
long as I have a computer that I have

566
00:24:16,950 --> 00:24:14,080
demonstrated I can load and bring up

567
00:24:18,480 --> 00:24:16,960
into our redundant set and into our

568
00:24:21,540 --> 00:24:18,490
common set if you will and that's the

569
00:24:22,740 --> 00:24:21,550
the collective of redundant computers if

570
00:24:24,930 --> 00:24:22,750
you will as long as I've demonstrated

571
00:24:26,730 --> 00:24:24,940
that I can do that I don't have any

572
00:24:30,270 --> 00:24:26,740
acute mission duration impacts now

573
00:24:32,490 --> 00:24:30,280
having said that if we were to

574
00:24:35,640 --> 00:24:32,500
experience another problem with a

575
00:24:37,710 --> 00:24:35,650
different computer honestly I think we

576
00:24:40,020 --> 00:24:37,720
would all be thinking very very hard

577
00:24:42,419 --> 00:24:40,030
about what was going on we do what we

578
00:24:44,250 --> 00:24:42,429
always do which is we would would get

579
00:24:45,720 --> 00:24:44,260
the data first the very first steps of

580
00:24:47,850 --> 00:24:45,730
our troubleshooting procedures are to do

581
00:24:49,770 --> 00:24:47,860
data dumps we've you data dumps of the

582
00:24:51,360 --> 00:24:49,780
computer that was functional and

583
00:24:54,060 --> 00:24:51,370
monitoring the other computers in the

584
00:24:55,950 --> 00:24:54,070
set to see what it saw we do data dumps

585
00:24:58,590 --> 00:24:55,960
of the failed computer to see what it

586
00:25:01,200 --> 00:24:58,600
thinks it saw about itself and we get

587
00:25:03,419 --> 00:25:01,210
the engineers to analyze that and and

588
00:25:06,030 --> 00:25:03,429

take a good hard look at it beyond that

589
00:25:08,520 --> 00:25:06,040
we draw some some some reasonable

590
00:25:10,110 --> 00:25:08,530
conclusions about what would happen so

591
00:25:12,990 --> 00:25:10,120
that's about as much as I could I could

592
00:25:16,049 --> 00:25:13,000
tell you about about our response to

593
00:25:18,630 --> 00:25:16,059
another issue again just to emphasize

594
00:25:21,240 --> 00:25:18,640
even with the problem we had on GPC 3

595
00:25:23,910 --> 00:25:21,250
which was due to a condition that we

596
00:25:26,610 --> 00:25:23,920
have an explanation for and the problem

597
00:25:28,560 --> 00:25:26,620
that we've had on GPC for which we don't

598
00:25:31,410 --> 00:25:28,570
yet have an explanation for what I can

599
00:25:33,090 --> 00:25:31,420
tell you is that we have demonstrated

600
00:25:35,910 --> 00:25:33,100
the ability to bring both of those

601
00:25:39,000 --> 00:25:35,920
computers up to full computational

602
00:25:41,000 --> 00:25:39,010
readiness and add them to our redundant

603
00:25:44,820 --> 00:25:41,010
set and so that's a meaningful

604
00:25:46,380 --> 00:25:44,830
capability that we have I believe that

605
00:25:48,560 --> 00:25:46,390
was our last question from Kennedy Space

606
00:25:52,680 --> 00:25:48,570
Center will go down to the phone bridge

607
00:25:54,690 --> 00:25:52,690
we'll start with Bill Harwood hey thanks

608
00:25:55,950 --> 00:25:54,700
alesya I just want to follow Marshalls

609
00:25:58,530 --> 00:25:55,960
question I have two quick ones along

610
00:26:00,360 --> 00:25:58,540
those lines some of flight rules

611
00:26:03,270 --> 00:26:00,370
perspective if you have a computer to

612
00:26:04,770 --> 00:26:03,280
steam the victim of a transient I know

613
00:26:06,780 --> 00:26:04,780

that's address specifically in there

614
00:26:10,049 --> 00:26:06,790
what did it take to make you fully trust

615
00:26:12,690 --> 00:26:10,059
it again okay that's an excellent

616
00:26:15,450 --> 00:26:12,700
question a computer that is that is

617
00:26:16,250 --> 00:26:15,460
deemed to be the victim of a transient

618
00:26:19,000 --> 00:26:16,260
hardware fail

619
00:26:21,730 --> 00:26:19,010
and how we get to that determination is

620
00:26:24,110 --> 00:26:21,740
after analyzing all of this dump data

621
00:26:26,480 --> 00:26:24,120
after analyzing the memory of the

622
00:26:28,760 --> 00:26:26,490
computers in the absence of any other

623
00:26:31,070 --> 00:26:28,770
credible explanation like a switch

624
00:26:35,380 --> 00:26:31,080
switch tease or some other some other

625
00:26:38,390 --> 00:26:35,390
issue if we don't see any software

626
00:26:40,940 --> 00:26:38,400
problem or indication of a computational

627
00:26:42,680 --> 00:26:40,950
error what that tells us in the

628
00:26:45,290 --> 00:26:42,690
conclusion that we draw from that is

629
00:26:47,660 --> 00:26:45,300
that there's some transient

630
00:26:50,870 --> 00:26:47,670
hardware-based condition that resulted

631
00:26:53,780 --> 00:26:50,880
in the the GP sees temporary loss of

632
00:26:57,620 --> 00:26:53,790
function in that instance we have

633
00:27:00,500 --> 00:26:57,630
specific guidance as to which buses we

634
00:27:03,770 --> 00:27:00,510
will allow that GPC to drive so in the

635
00:27:05,900 --> 00:27:03,780
instance of GPC for if it is determined

636
00:27:09,440 --> 00:27:05,910
that this was a transient hardware

637
00:27:13,310 --> 00:27:09,450
failure my rules tell me that however I

638
00:27:17,060 --> 00:27:13,320

configure it I can only assign it to to

639
00:27:19,790 --> 00:27:17,070
drive what we call string 4 and that is

640
00:27:21,590 --> 00:27:19,800
chosen because of the the types of

641
00:27:24,620 --> 00:27:21,600
hardware that are connected to that

642
00:27:28,160 --> 00:27:24,630
particular data bus the hardware that's

643
00:27:30,830 --> 00:27:28,170
connected to data buses 1 2 & 3 are

644
00:27:32,180 --> 00:27:30,840
deemed of such a critical nature that we

645
00:27:34,760 --> 00:27:32,190
don't want to subject them to the

646
00:27:36,920 --> 00:27:34,770
possibility of another transient

647
00:27:38,750 --> 00:27:36,930
hardware fault that might impact our

648
00:27:40,910 --> 00:27:38,760
ability to control the spacecraft during

649
00:27:44,180 --> 00:27:40,920
critical operations like undocking

650
00:27:48,380 --> 00:27:44,190
fly-around and certainly for re-entry so

651
00:27:52,820 --> 00:27:48,390
even the good news is that because this

652
00:27:55,970 --> 00:27:52,830
is GPC for and our nominal configuration

653
00:27:58,970 --> 00:27:55,980
for entry is such that we assign GPC 42

654
00:28:00,470 --> 00:27:58,980
string for even if it's if it's deemed

655
00:28:02,990 --> 00:28:00,480
the victim of a transient hardware

656
00:28:05,840 --> 00:28:03,000
failure unless we see something more

657
00:28:08,450 --> 00:28:05,850
insidious that gives us pause we can

658
00:28:10,940 --> 00:28:08,460
basically assign this GPC to its nominal

659
00:28:13,760 --> 00:28:10,950
string to its nominal data bus that we

660
00:28:15,650 --> 00:28:13,770
would normally do for entry because if

661
00:28:18,200 --> 00:28:15,660
it does experience a problem during

662
00:28:20,750 --> 00:28:18,210
entry the particular failure mode in

663
00:28:23,300 --> 00:28:20,760

this instance with that data config will

664
00:28:24,890 --> 00:28:23,310
not cause any immediate problems for

665
00:28:29,010 --> 00:28:24,900
controllability the spacecraft during

666
00:28:31,470 --> 00:28:29,020
reentry thanks got that and to

667
00:28:32,820 --> 00:28:31,480
two more real quick ones from the flight

668
00:28:34,650 --> 00:28:32,830
real perspective and where you stand

669
00:28:36,750 --> 00:28:34,660
today none of these computers are failed

670
00:28:38,550 --> 00:28:36,760
at this point you have all five at this

671
00:28:39,960 --> 00:28:38,560
point although there are some leans

672
00:28:41,760 --> 00:28:39,970
against four until you finish your

673
00:28:44,910 --> 00:28:41,770
analysis that right that's absolutely

674
00:28:46,350 --> 00:28:44,920
correct okay thank you know reporters

675
00:28:47,910 --> 00:28:46,360
whenever things like this happen we all

676
00:28:49,230 --> 00:28:47,920
focus on this and think about it real

677
00:28:51,390 --> 00:28:49,240
hard because we don't understand it to

678
00:28:53,250 --> 00:28:51,400
the degree you do do you consider this a

679
00:28:56,730 --> 00:28:53,260
major issue a minor issue or something

680
00:29:00,800 --> 00:28:56,740
in between well I tell you I consider

681
00:29:04,290 --> 00:29:00,810
every issue a major issue until I

682
00:29:06,870 --> 00:29:04,300
believe we fully understand it and have

683
00:29:10,440 --> 00:29:06,880
no reason to think otherwise so right

684
00:29:12,900 --> 00:29:10,450
now the again we've analyzed only part

685
00:29:15,870 --> 00:29:12,910
of the dump data bill and and we haven't

686
00:29:17,370 --> 00:29:15,880
seen any any obvious software problems

687
00:29:19,380 --> 00:29:17,380
honestly that's the thing I tend to

688
00:29:21,780 --> 00:29:19,390

worry about the most you know there's

689
00:29:23,880 --> 00:29:21,790
some error in the flight software that

690
00:29:26,670 --> 00:29:23,890
we haven't cotton because of the exact

691
00:29:29,160 --> 00:29:26,680
time of day that when the time of the

692
00:29:32,370 --> 00:29:29,170
year and the particular value from the

693
00:29:33,840 --> 00:29:32,380
master clock when when figured into all

694
00:29:35,760 --> 00:29:33,850
of the other computations basically

695
00:29:38,070 --> 00:29:35,770
makes the thing fail that that sort of

696
00:29:39,990 --> 00:29:38,080
thing I that's the scenario that tends

697
00:29:42,420 --> 00:29:40,000
to keep me up at night so once we

698
00:29:45,110 --> 00:29:42,430
complete the dump complete our analysis

699
00:29:47,130 --> 00:29:45,120
excuse me of the dump data and

700
00:29:49,490 --> 00:29:47,140
determined that we don't see any

701
00:29:52,950 --> 00:29:49,500
indications of that type of scenario

702
00:29:56,460 --> 00:29:52,960
then I will I will be a bit more

703
00:29:58,590 --> 00:29:56,470
comfortable but I never I never let

704
00:30:01,020 --> 00:29:58,600
myself get get too comfortable until

705
00:30:03,900 --> 00:30:01,030
we've got all of our friends with their

706
00:30:05,220 --> 00:30:03,910
boots on the ground okay well thanks let

707
00:30:07,710 --> 00:30:05,230
me just squeeze in one last quick window

708
00:30:08,880 --> 00:30:07,720
at this point barring something unusual

709
00:30:10,440 --> 00:30:08,890
like you say with the software or

710
00:30:11,760 --> 00:30:10,450
whatever you would expect to have all

711
00:30:14,370 --> 00:30:11,770
five of these guys up and running for

712
00:30:17,550 --> 00:30:14,380
entry at this point that's my

713
00:30:20,610 --> 00:30:17,560

expectation but again that's pending the

714
00:30:23,490 --> 00:30:20,620
results of the remaining analysis of the

715
00:30:26,490 --> 00:30:23,500
dump data okay thanks a lot okay thank

716
00:30:28,110 --> 00:30:26,500
you Bill mother James Dean thank you

717
00:30:31,280 --> 00:30:28,120
very much James Dean with florida today

718
00:30:34,170 --> 00:30:31,290
and it gets just one more on the G pcs

719
00:30:36,810 --> 00:30:34,180
let's start with them so I understand

720
00:30:40,560 --> 00:30:36,820
expectations you have all five but

721
00:30:41,730 --> 00:30:40,570
setting aside more critical issues I

722
00:30:42,630 --> 00:30:41,740
guess where you'd have to cut short

723
00:30:46,020 --> 00:30:42,640
mission duration

724
00:30:48,810 --> 00:30:46,030
if you didn't have all five again I'm

725
00:30:52,140 --> 00:30:48,820
just trying to understand how that would

726
00:30:55,620 --> 00:30:52,150
impact your the Warriors ability to you

727
00:30:57,090 --> 00:30:55,630
know execute its its undock and reentry

728
00:31:00,090 --> 00:30:57,100
and all that stuff and you you really

729
00:31:02,400 --> 00:31:00,100
actually only need a few it's one

730
00:31:04,380 --> 00:31:02,410
computer to get through it all or you

731
00:31:05,970 --> 00:31:04,390
know what is the impact of not having

732
00:31:09,900 --> 00:31:05,980
five step or turn out to be the case

733
00:31:14,400 --> 00:31:09,910
okay let me try to address your question

734
00:31:16,500 --> 00:31:14,410
without without without boring basically

735
00:31:18,480 --> 00:31:16,510
the the benefit we have from the

736
00:31:20,730 --> 00:31:18,490
multiple computers during the critical

737
00:31:24,750 --> 00:31:20,740
phase is that we can have more than one

738
00:31:28,230 --> 00:31:24,760

computer assigned to to drive a

739
00:31:29,880 --> 00:31:28,240
particular data bus or a particular set

740
00:31:32,730 --> 00:31:29,890
of equipment on the spacecraft that we

741
00:31:35,480 --> 00:31:32,740
need to control thrusters to steer the

742
00:31:37,740 --> 00:31:35,490
spacecraft and to get critical

743
00:31:40,650 --> 00:31:37,750
navigational data from its sensors and

744
00:31:43,800 --> 00:31:40,660
so by having multiple computers we are

745
00:31:47,400 --> 00:31:43,810
able to selectively assign each physical

746
00:31:50,130 --> 00:31:47,410
machine to drive a particular data bus

747
00:31:52,110 --> 00:31:50,140
while again in the redundant set those

748
00:31:53,520 --> 00:31:52,120
computers talk to each other so that

749
00:31:55,500 --> 00:31:53,530
they can monitor each other's

750
00:31:57,240 --> 00:31:55,510
performance and exchange data and

751
00:31:59,850 --> 00:31:57,250
fundamentally compute the same things

752
00:32:02,750 --> 00:31:59,860
and so what that does for us is it

753
00:32:06,600 --> 00:32:02,760
prevents the failure of any one computer

754
00:32:08,670 --> 00:32:06,610
from taking away functionality that

755
00:32:10,860 --> 00:32:08,680
might cause a dangerous loss of control

756
00:32:14,010 --> 00:32:10,870
of the spacecraft so I just set that up

757
00:32:15,990 --> 00:32:14,020
because that's fundamentally the driver

758
00:32:19,950 --> 00:32:16,000
that really drives how we manage these

759
00:32:21,870 --> 00:32:19,960
so if we do have a problem with another

760
00:32:24,240 --> 00:32:21,880
computer or we see something such

761
00:32:26,310 --> 00:32:24,250
something with GPC for for instance in

762
00:32:28,830 --> 00:32:26,320
our analysis such that we we will not

763
00:32:30,150 --> 00:32:28,840

have it up for entry again we don't

764
00:32:32,490 --> 00:32:30,160
think that's what we get to but if we do

765
00:32:35,070 --> 00:32:32,500
get there what that simply means is that

766
00:32:38,220 --> 00:32:35,080
the data bus that would normally be

767
00:32:40,740 --> 00:32:38,230
driven directly by GPC for will simply

768
00:32:43,200 --> 00:32:40,750
be assigned to another computer and that

769
00:32:46,020 --> 00:32:43,210
other computer which would normally only

770
00:32:49,290 --> 00:32:46,030
have one bus assigned to it for entry

771
00:32:52,320 --> 00:32:49,300
would have to and the way we would pick

772
00:32:56,400 --> 00:32:52,330
which computer would share the two buses

773
00:33:00,960 --> 00:32:56,410
is based on what provides us the best

774
00:33:03,780 --> 00:33:00,970
just failure tolerance against a loss of

775
00:33:06,030 --> 00:33:03,790
control or degraded control for that

776
00:33:11,280 --> 00:33:06,040
situation so hopefully that makes some

777
00:33:15,600 --> 00:33:11,290
sense thank you and wondering if you

778
00:33:18,450 --> 00:33:15,610
mentioned the the transfer completion

779
00:33:21,390 --> 00:33:18,460
percentage and wondering if this these

780
00:33:24,900 --> 00:33:21,400
uh you know glitches and other special

781
00:33:26,460 --> 00:33:24,910
events we're seeing today i have i guess

782
00:33:29,280 --> 00:33:26,470
the crew already had some off-duty time

783
00:33:31,320 --> 00:33:29,290
built in but would you still say they're

784
00:33:33,660 --> 00:33:31,330
ahead of schedule or will be by the end

785
00:33:37,110 --> 00:33:33,670
of the day or has this load of down a

786
00:33:40,230 --> 00:33:37,120
little bit more and maybe put am just on

787
00:33:42,960 --> 00:33:40,240
schedule and and this could follow up to

788
00:33:46,320 --> 00:33:42,970

that since you said that i think the

789
00:33:48,810 --> 00:33:46,330
goal is to get raffaello filled up to

790
00:33:52,950 --> 00:33:48,820
about ninety percent any possibility

791
00:33:54,600 --> 00:33:52,960
have an estimate of the actual pounds of

792
00:33:58,200 --> 00:33:54,610
cargo that are that that amounts to

793
00:34:00,360 --> 00:33:58,210
being loaded back into Rafaella okay to

794
00:34:02,820 --> 00:34:00,370
address the the first question these

795
00:34:05,340 --> 00:34:02,830
problems these these little glitches if

796
00:34:07,920 --> 00:34:05,350
you will have indeed slowed the crew

797
00:34:11,040 --> 00:34:07,930
down now the good news is because they

798
00:34:13,080 --> 00:34:11,050
were running ahead of the timeline not

799
00:34:15,720 --> 00:34:13,090
tremendously head with with the transfer

800
00:34:17,490 --> 00:34:15,730
because the transfer is really really

801
00:34:19,950 --> 00:34:17,500
the the meat of the mission and it's

802
00:34:21,150 --> 00:34:19,960
it's just it's a it's a really messy

803
00:34:23,490 --> 00:34:21,160
operation until you get everything

804
00:34:25,140 --> 00:34:23,500
organized but but sandy and the rest of

805
00:34:27,750 --> 00:34:25,150
the crew were running a far enough ahead

806
00:34:30,630 --> 00:34:27,760
that once we were able to once we took

807
00:34:32,730 --> 00:34:30,640
some time to troubleshoot the computers

808
00:34:34,500 --> 00:34:32,740
to give the crew at extra 30 minutes of

809
00:34:36,300 --> 00:34:34,510
sleep time this morning to make up for

810
00:34:39,240 --> 00:34:36,310
the sleep time that was lost all of

811
00:34:40,740 --> 00:34:39,250
those little things we are right on plan

812
00:34:43,680 --> 00:34:40,750
at this point we're right on the

813
00:34:45,060 --> 00:34:43,690

timeline so the little margin we had we

814
00:34:46,320 --> 00:34:45,070
gave some up for computer

815
00:34:49,590 --> 00:34:46,330
troubleshooting and now we're right on

816
00:34:52,320 --> 00:34:49,600
plan as far as an estimate of the the

817
00:34:54,780 --> 00:34:52,330
amount of mass honestly right now i

818
00:34:56,370 --> 00:34:54,790
can't really give you a great estimate

819
00:34:59,640 --> 00:34:56,380
we're at a we're at a phase of the

820
00:35:01,800 --> 00:34:59,650
choreography of transfer to where I

821
00:35:04,080 --> 00:35:01,810
really won't know what the mass

822
00:35:06,930 --> 00:35:04,090
properties of rafaela looked like

823
00:35:09,810 --> 00:35:06,940
until we complete the evening transfer

824
00:35:12,450 --> 00:35:09,820
brief tonight and have incorporated all

825
00:35:15,900 --> 00:35:12,460
of the updates we get from from from

826
00:35:18,840 --> 00:35:15,910
Sandy into our transfer plan for

827
00:35:24,180 --> 00:35:18,850
tomorrow I think probably this time

828
00:35:25,560 --> 00:35:24,190
tomorrow Chris Edelen or the the other

829
00:35:27,780 --> 00:35:25,570
flight directors on the station side

830
00:35:31,410 --> 00:35:27,790
will probably have a better idea of how

831
00:35:34,890 --> 00:35:31,420
much mass is in the MPN I could ask just

832
00:35:39,810 --> 00:35:34,900
one more question on transfer is that

833
00:35:41,790 --> 00:35:39,820
the essentially what most what you've

834
00:35:44,940 --> 00:35:41,800
gotten out of the extra day that's been

835
00:35:47,640 --> 00:35:44,950
added is just increasing that percentage

836
00:35:49,560 --> 00:35:47,650
that you're loading back into raffaello

837
00:35:51,630 --> 00:35:49,570
is that essentially what what's been

838
00:35:53,480 --> 00:35:51,640

gained aside from any other sort of

839
00:35:56,040 --> 00:35:53,490
organization stuff on the station

840
00:35:58,200 --> 00:35:56,050
increasing the percentage of cargo that

841
00:35:59,700 --> 00:35:58,210
we load into the MPL m that's a big

842
00:36:02,340 --> 00:35:59,710
piece of what's been gained with the

843
00:36:04,140 --> 00:36:02,350
extra day we think we are on a

844
00:36:06,480 --> 00:36:04,150
trajectory to where we will be able to

845
00:36:10,170 --> 00:36:06,490
fill the MPL em up to virtually a

846
00:36:11,790 --> 00:36:10,180
hundred percent volumetrically and so

847
00:36:13,350 --> 00:36:11,800
that's a big piece of what's been gained

848
00:36:15,480 --> 00:36:13,360
the other the other part of what's been

849
00:36:19,710 --> 00:36:15,490
gained is that we have additional time

850
00:36:22,080 --> 00:36:19,720
to to do some some science that we

851
00:36:25,380 --> 00:36:22,090
weren't otherwise planning to be able to

852
00:36:28,350 --> 00:36:25,390
do and to get the the samples many of

853
00:36:31,170 --> 00:36:28,360
them are biological from that science

854
00:36:32,790 --> 00:36:31,180
back home on the orbiter on a much

855
00:36:37,530 --> 00:36:32,800
accelerated timeframe than we were

856
00:36:39,270 --> 00:36:37,540
otherwise expecting to thank you James

857
00:36:43,140 --> 00:36:39,280
do we have anyone else on the phone

858
00:36:45,690 --> 00:36:43,150
bridge please yes Charles Agatha yes go

859
00:36:47,790 --> 00:36:45,700
ahead yeah throw back in examiner com

860
00:36:49,560 --> 00:36:47,800
space on shares calm turning over to the

861
00:36:50,880 --> 00:36:49,570
weather I was wondering if you could

862
00:36:54,210 --> 00:36:50,890
comment if you've been in talks with

863
00:36:56,940 --> 00:36:54,220

jaksa on the pending typhoon mahon that

864
00:37:00,360 --> 00:36:56,950
approaching southern Japan possibly

865
00:37:02,640 --> 00:37:00,370
tuesday night okay unfortunately I don't

866
00:37:06,600 --> 00:37:02,650
have any information on that at this

867
00:37:08,170 --> 00:37:06,610
time but we'll be sure to to get some

868
00:37:10,390 --> 00:37:08,180
information in

869
00:37:12,549 --> 00:37:10,400
and provide some some feedback for you

870
00:37:15,849 --> 00:37:12,559
on the mission status briefing tomorrow

871
00:37:18,700 --> 00:37:15,859
or the following day okay thank you so

872
00:37:22,630 --> 00:37:18,710
much okay do we have any follow-ups here

873
00:37:25,960 --> 00:37:22,640
at houston mark I'm sorry thanks again

874
00:37:29,230 --> 00:37:25,970
mark Grove for aviation week if if you

875
00:37:31,089 --> 00:37:29,240
look at what happened with GP c4 and it

876
00:37:33,849 --> 00:37:31,099
looks like it had something to do with

877
00:37:37,480 --> 00:37:33,859
with flying through the South Atlantic

878
00:37:40,900 --> 00:37:37,490
anomaly and radiation where does that

879
00:37:44,349 --> 00:37:40,910
leave you with GPC for in terms of

880
00:37:47,339 --> 00:37:44,359
future hops can you use it for re-entry

881
00:37:50,559 --> 00:37:47,349
and undocking and all of that does it

882
00:37:52,450 --> 00:37:50,569
leave you with a with a hardware

883
00:37:56,920 --> 00:37:52,460
question that kind of puts you back on a

884
00:37:59,859 --> 00:37:56,930
quandary okay if it turns out that that

885
00:38:03,579 --> 00:37:59,869
we have no other credible explanation or

886
00:38:06,910 --> 00:38:03,589
smoking gun if you will and and just to

887
00:38:10,390 --> 00:38:06,920
be clear after we analyze the dump data

888
00:38:12,069 --> 00:38:10,400

if we don't see any obvious problems or

889
00:38:16,200 --> 00:38:12,079
any indications of software or

890
00:38:19,059 --> 00:38:16,210
computational errors you know the the

891
00:38:21,370 --> 00:38:19,069
global category of what's left which is

892
00:38:24,160 --> 00:38:21,380
the transient hardware failure could be

893
00:38:26,650 --> 00:38:24,170
anything radiation being one of many

894
00:38:30,789 --> 00:38:26,660
possible causes of a transient hardware

895
00:38:35,559 --> 00:38:30,799
failure in that case we would treat the

896
00:38:38,859 --> 00:38:35,569
GPC as suspect if you will just to use

897
00:38:41,380 --> 00:38:38,869
layman's terms and as I described the

898
00:38:43,150 --> 00:38:41,390
flight rules earlier there are certain

899
00:38:45,760 --> 00:38:43,160
flight critical buses we simply would

900
00:38:48,640 --> 00:38:45,770
not assign that computer to control

901
00:38:50,349 --> 00:38:48,650
during critical operations like the

902
00:38:53,799 --> 00:38:50,359
undocking fly-around and so what what I

903
00:38:56,200 --> 00:38:53,809
would do as as my team will be executing

904
00:38:57,910 --> 00:38:56,210
the undocking fly-around is we would

905
00:39:00,339 --> 00:38:57,920
assign the The Associated flight

906
00:39:02,020 --> 00:39:00,349
critical buses to the other computers

907
00:39:04,930 --> 00:39:02,030
that we had available to us now since

908
00:39:07,030 --> 00:39:04,940
GPC 5 has our backup flight software and

909
00:39:09,280 --> 00:39:07,040
we normally keep that azz sleepy to

910
00:39:12,640 --> 00:39:09,290
serve as our BFS or backup flight

911
00:39:16,329 --> 00:39:12,650
software machine I would continue to

912
00:39:18,730 --> 00:39:16,339
leverage GPC to notionally to do our

913
00:39:20,660 --> 00:39:18,740

systems management functions and rely on

914
00:39:22,880 --> 00:39:20,670
g pcs one and three

915
00:39:25,880 --> 00:39:22,890
for the GNC function during the

916
00:39:27,260 --> 00:39:25,890
undocking fly-around now for entry again

917
00:39:30,470 --> 00:39:27,270
because of how we normally do the

918
00:39:33,650 --> 00:39:30,480
stringing in which data bus I'm allowed

919
00:39:35,210 --> 00:39:33,660
to put GPC for on I would actually have

920
00:39:38,059 --> 00:39:35,220
something that very much looks like a

921
00:39:41,210 --> 00:39:38,069
nominal string for entry so between

922
00:39:44,120 --> 00:39:41,220
undocking and entry we would probably

923
00:39:46,059 --> 00:39:44,130
have GPC for remain asleep except for

924
00:39:51,859 --> 00:39:46,069
periods where we might want to get some

925
00:39:53,450 --> 00:39:51,869
just some innocuous runtime on the GPC

926
00:39:56,390 --> 00:39:53,460
just to watch it compute without it

927
00:39:57,799 --> 00:39:56,400
driving any flight critical buses but it

928
00:40:00,670 --> 00:39:57,809
probably stay asleep until it was time

929
00:40:03,620 --> 00:40:00,680
to bring it up and string it for entry

930
00:40:05,299 --> 00:40:03,630
Irene Klotz with Reuters and just to

931
00:40:07,880 --> 00:40:05,309
make sure I understand the bottom line

932
00:40:10,460 --> 00:40:07,890
along this is that if GPC for is

933
00:40:13,819 --> 00:40:10,470
transient it is not considered failed

934
00:40:16,730 --> 00:40:13,829
for the flight rule that would that

935
00:40:18,859 --> 00:40:16,740
would become come into play without to

936
00:40:21,710 --> 00:40:18,869
out and then this other question is

937
00:40:23,329 --> 00:40:21,720
really silly but at this point on with

938
00:40:25,789 --> 00:40:23,339

the way that computers are right now has

939
00:40:29,180 --> 00:40:25,799
there been any changes at all to how you

940
00:40:31,430 --> 00:40:29,190
want the crew to be packing stuff up for

941
00:40:34,520 --> 00:40:31,440
the return home or unpacking things

942
00:40:39,230 --> 00:40:34,530
there been any kind of mission logistics

943
00:40:41,900 --> 00:40:39,240
album impacts just you know five failure

944
00:40:44,089 --> 00:40:41,910
modes down the way if you did end up

945
00:40:45,950 --> 00:40:44,099
having to leave early thanks okay that's

946
00:40:48,859 --> 00:40:45,960
an excellent question and the easy

947
00:40:50,839 --> 00:40:48,869
answer is we have not changed any aspect

948
00:40:53,839 --> 00:40:50,849
of how we've been executing the mission

949
00:40:55,520 --> 00:40:53,849
as a result of the the GPC failures is

950
00:40:57,440 --> 00:40:55,530
you know from a strategic perspective or

951
00:41:00,200 --> 00:40:57,450
from a tactical perspective with respect

952
00:41:02,000 --> 00:41:00,210
to the transfer we are executing on plan

953
00:41:05,329 --> 00:41:02,010
the only adjustment we've made is

954
00:41:07,730 --> 00:41:05,339
because we took about 30 minutes of the

955
00:41:10,039 --> 00:41:07,740
crew sleep time last night to to move

956
00:41:13,460 --> 00:41:10,049
this the systems management machine to

957
00:41:17,059 --> 00:41:13,470
GPC to we gave them an additional 30

958
00:41:18,710 --> 00:41:17,069
minutes to sleep and adjusted our plan

959
00:41:21,079 --> 00:41:18,720
to make everything fit in the box

960
00:41:22,700 --> 00:41:21,089
properly other than that there's nothing

961
00:41:24,140 --> 00:41:22,710
that we've done differently and nothing

962
00:41:26,780 --> 00:41:24,150
that we anticipate doing differently

963
00:41:29,720 --> 00:41:26,790

unless again we see something that's

964
00:41:32,610 --> 00:41:29,730
that's more sinister and so far we

965
00:41:35,190 --> 00:41:32,620
haven't seen any evidence of that

966
00:41:36,750 --> 00:41:35,200
any others here in Houston seeing none a

967
00:41:39,170 --> 00:41:36,760
couple of NASA television programming

968
00:41:42,780 --> 00:41:39,180
notes at eleven twenty nine Central Time

969
00:41:45,150 --> 00:41:42,790
1229 Eastern President Barack Obama is

970
00:41:48,990 --> 00:41:45,160
scheduled call station crew members and

971
00:41:51,270 --> 00:41:49,000
at one thirty p.m. central time to 30

972
00:41:53,670 --> 00:41:51,280
p.m. eastern will have a replay of the

973
00:41:55,560 --> 00:41:53,680
crew news conference traditional

974
00:41:57,840 --> 00:41:55,570
reminder you can follow activities of

975
00:42:01,890 --> 00:41:57,850
the International Space Station and the