1
00:00:04,400 --> 00:00:02,929
good morning and welcome back to NASA's

2
00:00:06,349 --> 00:00:04,410
Johnson Space Center we're having our

3
00:00:09,740 --> 00:00:06,359
missions des briefing for flight day 10

4
00:00:11,629 --> 00:00:09,750
of the sts-134 space shuttle mission to

5
00:00:13,220 --> 00:00:11,639
the international space station so we'll

6
00:00:15,410 --> 00:00:13,230
talk about the spacewalk that occurred

7
00:00:17,300 --> 00:00:15,420
overnight and to do that we have the

8
00:00:19,250 --> 00:00:17,310
lead International Space Station flight

9
00:00:22,490 --> 00:00:19,260
director for the mission Derek Hoffman

10
00:00:24,439 --> 00:00:22,500
and the lead spacewalk officer Allison

11
00:00:26,929 --> 00:00:24,449
Bolinger so we'll turn it over for

12
00:00:28,099 --> 00:00:26,939
comments and then take questions okay

13
00:00:30,890 --> 00:00:28,109

thanks Kylie and good morning everybody

14
00:00:32,840 --> 00:00:30,900
well another great day in Mission

15
00:00:35,120 --> 00:00:32,850
Control and on the space station the

16
00:00:37,970 --> 00:00:35,130
Space Shuttle Endeavor it's good to have

17
00:00:41,030 --> 00:00:37,980
EBA three behind us the EBA went went

18
00:00:43,000 --> 00:00:41,040
really really well you know after a VA

19
00:00:45,440 --> 00:00:43,010
one and two and and a number of

20
00:00:47,779 --> 00:00:45,450
relatively minor issues but but issues

21
00:00:49,610 --> 00:00:47,789
that represented challenges and slowed

22
00:00:52,010 --> 00:00:49,620
us down a little but it was really

23
00:00:54,130 --> 00:00:52,020
gratifying today to see the crew in the

24
00:00:57,560 --> 00:00:54,140
early part of the EBA get ahead and then

25
00:01:00,349 --> 00:00:57,570
finish strong and complete all the plant

26
00:01:02,510 --> 00:01:00,359
ask for EV a 3 in a dish in addition to

27
00:01:04,039 --> 00:01:02,520
one get ahead task which Allison will

28
00:01:06,289 --> 00:01:04,049
talk to you about and this was a good

29
00:01:09,890 --> 00:01:06,299
add task that was literally identified

30
00:01:11,780 --> 00:01:09,900
in the last 24 hours so very proud of

31
00:01:13,429 --> 00:01:11,790
the ground team again very proud of the

32
00:01:16,580 --> 00:01:13,439
crew another demonstration just how well

33
00:01:18,530 --> 00:01:16,590
well trained the crew has been and al

34
00:01:21,859 --> 00:01:18,540
well that ground team can go execute the

35
00:01:24,289 --> 00:01:21,869
plan the other unique part about this EV

36
00:01:26,179 --> 00:01:24,299
a was that we used a new pre-breathe

37
00:01:29,480 --> 00:01:26,189
protocol to get the the spacewalk and

38
00:01:31,160 --> 00:01:29,490

crew ready to go outside and if you

39
00:01:32,569 --> 00:01:31,170
recall from the previous briefings it's

40
00:01:34,460 --> 00:01:32,579
called the insuit light exercise

41
00:01:36,560 --> 00:01:34,470
protocol the big difference being that

42
00:01:38,780 --> 00:01:36,570
we don't it doesn't require an overnight

43
00:01:42,560 --> 00:01:38,790
camp out on the airlock and I told you

44
00:01:44,450 --> 00:01:42,570
that we would evaluate how that that

45
00:01:47,139 --> 00:01:44,460
protocol went after the the end of the

46
00:01:50,300 --> 00:01:47,149
EBA and then make a decision on TV a 4

47
00:01:53,330 --> 00:01:50,310
immediately filin TVA the spacewalk and

48
00:01:55,850 --> 00:01:53,340
crew had a private tag up with the

49
00:01:57,319 --> 00:01:55,860
flight surgeon and the flight surgeon

50
00:02:00,980 --> 00:01:57,329
reported that there was no medical

51
00:02:03,440 --> 00:02:00,990
issues whatsoever no symptoms no issues

52
00:02:06,560 --> 00:02:03,450
no difference whatsoever from camp out

53
00:02:08,900 --> 00:02:06,570
previous camp outs or from exercise pre

54
00:02:11,600 --> 00:02:08,910
breeze so he gave the crew a clean bill

55
00:02:13,180 --> 00:02:11,610
of health and then the crew had nothing

56
00:02:16,090 --> 00:02:13,190
but positive feedback about the

57
00:02:18,970 --> 00:02:16,100
call in addition Allison and I and her

58
00:02:20,350 --> 00:02:18,980
team had a had a tag up to talk more

59
00:02:22,300 --> 00:02:20,360
about the nuts and bolts of the ebas

60
00:02:23,980 --> 00:02:22,310
during that tag up we talked about the

61
00:02:27,400 --> 00:02:23,990
procedures that we use to execute the

62
00:02:30,490 --> 00:02:27,410
aisle protocol and and again the the

63
00:02:33,670 --> 00:02:30,500

crew was very positive no surprises no

64
00:02:35,830 --> 00:02:33,680
hiccups no changes required and they

65
00:02:37,630 --> 00:02:35,840
really loved the simplicity of the

66
00:02:40,990 --> 00:02:37,640
protocol the fact that it doesn't

67
00:02:43,330 --> 00:02:41,000
require as much time on on the oxygen

68
00:02:45,730 --> 00:02:43,340
masks it doesn't require the overnight

69
00:02:49,540 --> 00:02:45,740
campout so that very very positive

70
00:02:51,910 --> 00:02:49,550
feedback however having said all that we

71
00:02:53,530 --> 00:02:51,920
have made the decision on ebay for not

72
00:02:55,390 --> 00:02:53,540
to use the out protocol we're going to

73
00:02:57,310 --> 00:02:55,400
go with the standard campout protocol

74
00:02:59,440 --> 00:02:57,320
and I want to take a little time to

75
00:03:02,620 --> 00:02:59,450
explain that to you so it's so it's

76
00:03:05,620 --> 00:03:02,630
clear to everybody one difference

77
00:03:08,350 --> 00:03:05,630
between camp out and the aisle protocol

78
00:03:11,170 --> 00:03:08,360
is the time that the crew has on their

79
00:03:13,660 --> 00:03:11,180
lithium hydroxide canisters are the the

80
00:03:15,790 --> 00:03:13,670
casters in the suits that scrub co2 so

81
00:03:18,370 --> 00:03:15,800
if you look at a campout protocol when

82
00:03:20,080 --> 00:03:18,380
when the crew goes out the door vice the

83
00:03:23,140 --> 00:03:20,090
aisle protocol when the crew goes out

84
00:03:25,360 --> 00:03:23,150
the door there is 40 minutes more time

85
00:03:28,600 --> 00:03:25,370
on the layout canisters with the aisle

86
00:03:29,860 --> 00:03:28,610
protocol as compared to camp out so big

87
00:03:31,780 --> 00:03:29,870
picture when the crew goes out the door

88
00:03:33,610 --> 00:03:31,790

with aisle they have 40 minutes less

89
00:03:36,370 --> 00:03:33,620
capability on that carbon dioxide

90
00:03:39,460 --> 00:03:36,380
scrubbing canister so that that's one

91
00:03:42,820 --> 00:03:39,470
consideration and with tip with a

92
00:03:45,790 --> 00:03:42,830
typical I'll canister we can in a plan 6

93
00:03:48,370 --> 00:03:45,800
30 e VA we can accept that that 40

94
00:03:50,350 --> 00:03:48,380
minutes of additional usage on the

95
00:03:53,620 --> 00:03:50,360
layout can when we go out the door but

96
00:03:55,360 --> 00:03:53,630
you'll recall that on e VA for Mike

97
00:03:57,490 --> 00:03:55,370
Veeck is going to be ev1 so he'll be the

98
00:04:00,670 --> 00:03:57,500
lead spacewalker and Greg Shama top is

99
00:04:02,979 --> 00:04:00,680
going to be ev2 on EV a1 shamit off at

100
00:04:05,710 --> 00:04:02,989
an issue with the co2 sensor after that

101
00:04:08,830 --> 00:04:05,720
after that e vai talked about the the

102
00:04:11,860 --> 00:04:08,840
rules that require us to deduct ly o

103
00:04:14,380 --> 00:04:11,870
capability when you have that co2 sensor

104
00:04:16,120 --> 00:04:14,390
problem so you know regardless of how

105
00:04:18,759 --> 00:04:16,130
the lithium hydroxide canisters

106
00:04:20,860 --> 00:04:18,769
performing when we had that co2 sensor

107
00:04:23,290 --> 00:04:20,870
problem we are required to assume less

108
00:04:24,460 --> 00:04:23,300
capacity so when you look at the 40

109
00:04:26,310 --> 00:04:24,470
minutes associated with the aisle

110
00:04:28,140 --> 00:04:26,320
pre-breathe protocol

111
00:04:30,690 --> 00:04:28,150
combine that with the possible impacts

112
00:04:33,000 --> 00:04:30,700
of the co2 sensor it would reduce the

113
00:04:35,490 --> 00:04:33,010

capacity of Greg suit to the point that

114
00:04:38,490 --> 00:04:35,500
we might not be able to conduct a 630 e

115
00:04:40,530 --> 00:04:38,500
VA so those are the pieces that went in

116
00:04:43,290 --> 00:04:40,540
a decision not to do I alon DBA for and

117
00:04:46,050 --> 00:04:43,300
I just want to emphasize that you know

118
00:04:47,610 --> 00:04:46,060
medically procedurally and quality of

119
00:04:49,890 --> 00:04:47,620
life of the crew I was a complete

120
00:04:51,660 --> 00:04:49,900
success and I would expect that it's

121
00:04:56,610 --> 00:04:51,670
going to be the EV a choice on future

122
00:04:59,460 --> 00:04:56,620
ebas as a matter of fact I know the Ulf

123
00:05:01,460 --> 00:04:59,470
7 the 135 folks are planning that as

124
00:05:04,470 --> 00:05:01,470
their baseline for their single e VA so

125
00:05:08,520 --> 00:05:04,480
from all perspectives isles was aya was

126
00:05:09,810 --> 00:05:08,530
a complete success ani ba three and with

127
00:05:11,580 --> 00:05:09,820
that I'll hand over to Allison to talk

128
00:05:14,100 --> 00:05:11,590
about the details of the spectacular

129
00:05:16,230 --> 00:05:14,110
space walk today all right thanks a lot

130
00:05:18,780 --> 00:05:16,240
Derek I like dark mention dial was a

131
00:05:20,100 --> 00:05:18,790
huge success this morning I say this

132
00:05:22,110 --> 00:05:20,110
morning but i guess it was actually last

133
00:05:24,150 --> 00:05:22,120
night it seems like morning to me my

134
00:05:25,830 --> 00:05:24,160
team actually got on console a little

135
00:05:27,780 --> 00:05:25,840
bit early last night to be able to watch

136
00:05:29,370 --> 00:05:27,790
the slow-motion hokey pokey and action

137
00:05:31,170 --> 00:05:29,380
for real and it was it was really

138
00:05:32,640 --> 00:05:31,180

fabulous to see that protocol that we

139
00:05:35,190 --> 00:05:32,650
put so much time and effort pre-flight

140
00:05:37,200 --> 00:05:35,200
actually come to a reality and be

141
00:05:38,340 --> 00:05:37,210
extremely successful so with that said

142
00:05:41,190 --> 00:05:38,350
as Derek mentioned we had a very

143
00:05:44,400 --> 00:05:41,200
successful EV a 3d a duration of six

144
00:05:46,020 --> 00:05:44,410
hours and 54 minutes so drew and Spanky

145
00:05:48,570 --> 00:05:46,030
worked their hearts out today and got

146
00:05:50,130 --> 00:05:48,580
all of our tasks completed plus the get

147
00:05:52,110 --> 00:05:50,140
ahead that Derek mentioned at the end of

148
00:05:53,460 --> 00:05:52,120
the VA so we started out the day with

149
00:05:55,080 --> 00:05:53,470
the two crew members at the joint

150
00:05:57,540 --> 00:05:55,090
airlock where we retrieved some tool

151
00:05:59,730 --> 00:05:57,550
bags and then headed out to the port

152
00:06:02,070 --> 00:05:59,740
side of the FGB where we worked on

153
00:06:04,890 --> 00:06:02,080
setting up those bags and then removing

154
00:06:06,810 --> 00:06:04,900
some multi-layer insulation the first

155
00:06:08,580 --> 00:06:06,820
kind of surprise of the day was when we

156
00:06:09,930 --> 00:06:08,590
were expecting to release five pieces of

157
00:06:11,850 --> 00:06:09,940
multi-layer insulation we actually

158
00:06:13,620 --> 00:06:11,860
discovered there are seven pieces but

159
00:06:15,060 --> 00:06:13,630
the crew handled this flawlessly they

160
00:06:17,880 --> 00:06:15,070
were already planning on bundling those

161
00:06:20,100 --> 00:06:17,890
those mli pieces together on a wire tie

162
00:06:21,630 --> 00:06:20,110
and then Tim stowing it on a Russian

163
00:06:23,010 --> 00:06:21,640

handrail so they just continued with the

164
00:06:24,890 --> 00:06:23,020
process and just picked up the two

165
00:06:26,970 --> 00:06:24,900
additional pieces that we were required

166
00:06:29,280 --> 00:06:26,980
once they're a complete getting the work

167
00:06:30,660 --> 00:06:29,290
site prepped for the PDGF the grapple

168
00:06:33,090 --> 00:06:30,670
fixture they both headed back to the

169
00:06:35,250 --> 00:06:33,100
airlock and then retrieved the the PDGF

170
00:06:36,690 --> 00:06:35,260
and its frame and its cabling which is

171
00:06:38,760 --> 00:06:36,700
all one unit from the airlock and then

172
00:06:40,020 --> 00:06:38,770
they work together two inch worm that

173
00:06:42,660 --> 00:06:40,030
assembly back

174
00:06:44,130 --> 00:06:42,670
over to the port side of the FGB we

175
00:06:46,080 --> 00:06:44,140
installed that we got the three feet

176
00:06:48,030 --> 00:06:46,090
secured in soft duct and then we hand

177
00:06:49,680 --> 00:06:48,040
tightened the kind of the faucet

178
00:06:51,690 --> 00:06:49,690
mechanism that I call it that they you

179
00:06:54,120 --> 00:06:51,700
that faucet handle mechanism to tighten

180
00:06:56,430 --> 00:06:54,130
down those feet use the cheater bar the

181
00:06:57,780 --> 00:06:56,440
Russian that cheater bar to really lock

182
00:06:59,430 --> 00:06:57,790
those feet down and we are good to go

183
00:07:01,890 --> 00:06:59,440
then they started working on installing

184
00:07:03,540 --> 00:07:01,900
the vsc or video signal conditioner

185
00:07:05,430 --> 00:07:03,550
that's a single bolt that we installed

186
00:07:07,470 --> 00:07:05,440
and then they worked on routing the

187
00:07:09,690 --> 00:07:07,480
cables that three cables that came from

188
00:07:11,520 --> 00:07:09,700

the PDGF that were installed on the VSD

189
00:07:13,440 --> 00:07:11,530
and then a fourth cable that had been

190
00:07:15,660 --> 00:07:13,450
pre routed by a previous shuttle crew we

191
00:07:17,250 --> 00:07:15,670
also installed that on the vsc without

192
00:07:19,020 --> 00:07:17,260
any incident and then we installed a

193
00:07:21,030 --> 00:07:19,030
hard thermal cover that had some

194
00:07:22,860 --> 00:07:21,040
multi-layer insulation built into it we

195
00:07:24,690 --> 00:07:22,870
installed that over top of the VSD and

196
00:07:27,450 --> 00:07:24,700
then ran a Russian fixed length tether

197
00:07:29,850 --> 00:07:27,460
from the handle of that cover to the

198
00:07:31,740 --> 00:07:29,860
frame of the PDGF to help hold that hold

199
00:07:34,860 --> 00:07:31,750
that cover into place once we were

200
00:07:37,320 --> 00:07:34,870
complete with the vsc install we worked

201
00:07:39,000 --> 00:07:37,330
on kind of securing the PDGF work site

202
00:07:41,190 --> 00:07:39,010
and then we got started with installing

203
00:07:42,570 --> 00:07:41,200
the port why jumpers which provides the

204
00:07:44,790 --> 00:07:42,580
additional power redundancy to the

205
00:07:47,040 --> 00:07:44,800
Russian segment the port why jumper

206
00:07:48,720 --> 00:07:47,050
install went as we expected pre-flight

207
00:07:51,000 --> 00:07:48,730
we had two connections to make on the

208
00:07:53,340 --> 00:07:51,010
node and then one connection to make on

209
00:07:55,290 --> 00:07:53,350
the FGB side we had no issues with those

210
00:07:56,880 --> 00:07:55,300
once the crew is complete with those the

211
00:07:58,620 --> 00:07:56,890
ground started their work to check out

212
00:08:00,420 --> 00:07:58,630
than the new connections that we had

213
00:08:01,920 --> 00:08:00,430

just made as well as put the inhibits in

214
00:08:04,530 --> 00:08:01,930
place for the starboard why jumper

215
00:08:07,140 --> 00:08:04,540
install once complete with those why

216
00:08:08,880 --> 00:08:07,150
jumpers we took a tool bag and then

217
00:08:11,040 --> 00:08:08,890
headed back down to the lab to finish

218
00:08:13,050 --> 00:08:11,050
that lab external wireless communication

219
00:08:15,750 --> 00:08:13,060
or ewc task that we didn't get finished

220
00:08:17,940 --> 00:08:15,760
on EV a 12 crew members got in position

221
00:08:19,980 --> 00:08:17,950
and released the three Zeus fasteners on

222
00:08:21,810 --> 00:08:19,990
the micro meteor debris shield peeled

223
00:08:23,250 --> 00:08:21,820
that shield open released some

224
00:08:24,570 --> 00:08:23,260
multi-layer insulation underneath that

225
00:08:27,060 --> 00:08:24,580
and was at that point in time that they

226
00:08:30,090 --> 00:08:27,070
coordinated with the ground to inhibit

227
00:08:32,220 --> 00:08:30,100
the space station UHF radio once that

228
00:08:33,870 --> 00:08:32,230
inhibits were in place we were able to

229
00:08:35,940 --> 00:08:33,880
still communicate with the crew using

230
00:08:37,380 --> 00:08:35,950
shuttle assets so that was good that we

231
00:08:38,790 --> 00:08:37,390
were able to maintain constant

232
00:08:40,950 --> 00:08:38,800
communication with the crew during that

233
00:08:43,770 --> 00:08:40,960
entire task while underneath that shield

234
00:08:45,240 --> 00:08:43,780
they d mated to existing cables to

235
00:08:47,760 --> 00:08:45,250
existing connectors and installed the

236
00:08:51,420 --> 00:08:47,770
new cable and then they work together to

237
00:08:52,350 --> 00:08:51,430
slowly close the shield it was during

238
00:08:53,819 --> 00:08:52,360

the the clue

239
00:08:55,980 --> 00:08:53,829
sure of that shield as I mentioned there

240
00:08:57,480 --> 00:08:55,990
are three Zeus fasteners that hold that

241
00:08:58,680 --> 00:08:57,490
shield in place and historically we've

242
00:09:00,120 --> 00:08:58,690
had a few issues with these Zeus

243
00:09:01,949 --> 00:09:00,130
fasteners so the crew knew that these

244
00:09:04,230 --> 00:09:01,959
fasteners could be tricky and we had

245
00:09:05,639 --> 00:09:04,240
also discussed quite a bit pre-flight

246
00:09:07,620 --> 00:09:05,649
that only two of those three fasteners

247
00:09:09,720 --> 00:09:07,630
are ultimately required in order to

248
00:09:11,970 --> 00:09:09,730
ensure that the shield is structurally

249
00:09:13,380 --> 00:09:11,980
secure so the crew members were able to

250
00:09:15,509 --> 00:09:13,390
get two of those three fasteners

251
00:09:16,530 --> 00:09:15,519
installed without any issue and they

252
00:09:18,060 --> 00:09:16,540
spent a little bit of time

253
00:09:20,400 --> 00:09:18,070
troubleshooting the third fastener and

254
00:09:21,900 --> 00:09:20,410
discovered that the retaining wire they

255
00:09:23,639 --> 00:09:21,910
believed that the retaining wire that it

256
00:09:24,930 --> 00:09:23,649
engages on had kind of split out of

257
00:09:27,210 --> 00:09:24,940
place and we actually had a contingency

258
00:09:29,490 --> 00:09:27,220
tool with us to help us with that task

259
00:09:30,780 --> 00:09:29,500
but we decided on the ground based on

260
00:09:32,670 --> 00:09:30,790
our pre-flight agreement that two of

261
00:09:33,960 --> 00:09:32,680
three Zeus fasteners was sufficient and

262
00:09:35,579 --> 00:09:33,970
in order for us to remain on the

263
00:09:37,590 --> 00:09:35,589

timeline that we would just tell the

264
00:09:39,000 --> 00:09:37,600
crew thanks for the effort in a few

265
00:09:40,290 --> 00:09:39,010
extra minutes you spent on it but we're

266
00:09:41,850 --> 00:09:40,300
just going to we're just going to call

267
00:09:44,130 --> 00:09:41,860
it good and press with the task and so

268
00:09:47,819 --> 00:09:44,140
the crew is happy to hear that so once

269
00:09:49,650 --> 00:09:47,829
we successfully completed that ewc cable

270
00:09:52,110 --> 00:09:49,660
install we worked on stowing the old a

271
00:09:53,400 --> 00:09:52,120
whisk cable stowed that back inside the

272
00:09:56,190 --> 00:09:53,410
tool bag and then we made our way back

273
00:09:58,259 --> 00:09:56,200
to the FGB to start working on a

274
00:10:00,689 --> 00:09:58,269
starboard why jumper install it was

275
00:10:03,120 --> 00:10:00,699
while the ewc task was going on that our

276
00:10:04,710 --> 00:10:03,130
Falcon our power coordinator on the

277
00:10:06,509 --> 00:10:04,720
ground here was who was working with the

278
00:10:08,519 --> 00:10:06,519
the Russians informed us that we had

279
00:10:09,870 --> 00:10:08,529
made successful connections on the

280
00:10:12,180 --> 00:10:09,880
starboard side and they also had the

281
00:10:13,560 --> 00:10:12,190
inhibits in place sorry successful

282
00:10:14,730 --> 00:10:13,570
connections on the port side and they

283
00:10:16,500 --> 00:10:14,740
had the inhibits in place for the

284
00:10:18,509 --> 00:10:16,510
starboard side so the crew was able just

285
00:10:20,519 --> 00:10:18,519
seamlessly to start working on that

286
00:10:21,780 --> 00:10:20,529
starboard side we had expected the

287
00:10:23,610 --> 00:10:21,790
starboard side would be a little bit

288
00:10:25,650 --> 00:10:23,620

trickier because as if you were paying

289
00:10:27,000 --> 00:10:25,660
attention to the spacewalk guys spanky

290
00:10:27,960 --> 00:10:27,010
mentioned the rat's nest he's like

291
00:10:29,519 --> 00:10:27,970
there's a reason they don't call it

292
00:10:31,290 --> 00:10:29,529
something nice like a bird's nest but

293
00:10:33,990 --> 00:10:31,300
they call it a rat's nest because there

294
00:10:35,939 --> 00:10:34,000
are truly quite a bit of cables in that

295
00:10:38,730 --> 00:10:35,949
area so Spanky had to spend some time

296
00:10:40,410 --> 00:10:38,740
finding the best body position to be

297
00:10:42,960 --> 00:10:40,420
able to actuate the connectors that he

298
00:10:44,340 --> 00:10:42,970
was required to release but it was good

299
00:10:45,900 --> 00:10:44,350
that we were ahead in the timeline so he

300
00:10:47,189 --> 00:10:45,910
was able to spend as much time as he

301
00:10:48,870 --> 00:10:47,199
needed to get into place and he actually

302
00:10:51,150 --> 00:10:48,880
ended up calling drew over to a system

303
00:10:52,860 --> 00:10:51,160
but after persistence and you know much

304
00:10:54,150 --> 00:10:52,870
hard work he was able to successfully d

305
00:10:55,769 --> 00:10:54,160
mate the connector we needed and he

306
00:10:57,780 --> 00:10:55,779
installed the cap just like we required

307
00:11:00,000 --> 00:10:57,790
and then the rest of that cable install

308
00:11:01,579 --> 00:11:00,010
at went on without incident so I was

309
00:11:04,470 --> 00:11:01,589
very happy to see that get completed

310
00:11:05,670 --> 00:11:04,480
once we were complete with that task the

311
00:11:08,040 --> 00:11:05,680
crew worked on taking

312
00:11:11,010 --> 00:11:08,050
photos of the newly installed PDGF on

313
00:11:12,870 --> 00:11:11,020

the FGB as well as fgb thrusters and I'm

314
00:11:14,130 --> 00:11:12,880
sure they took some other photos while

315
00:11:15,570 --> 00:11:14,140
they were while they were working on

316
00:11:17,610 --> 00:11:15,580
that they also cleaned up their tool

317
00:11:19,800 --> 00:11:17,620
bags and packed those and to bring them

318
00:11:21,420 --> 00:11:19,810
back to the airlock it was at this point

319
00:11:23,160 --> 00:11:21,430
in time that drew was engrossing the

320
00:11:25,440 --> 00:11:23,170
airlock to stow some of the bags that we

321
00:11:27,570 --> 00:11:25,450
were complete with and also transfer his

322
00:11:29,100 --> 00:11:27,580
a digital still Evie a camera for the

323
00:11:30,780 --> 00:11:29,110
infrared evo camera that he was

324
00:11:31,980 --> 00:11:30,790
retrieving it was at this point when he

325
00:11:33,150 --> 00:11:31,990
popped out of the airlock and he

326
00:11:34,230 --> 00:11:33,160
mentioned that is that he had got

327
00:11:36,389 --> 00:11:34,240
something in his eyes and they were

328
00:11:38,220 --> 00:11:36,399
watering quite a bit and as after

329
00:11:40,680 --> 00:11:38,230
speaking to him after the EV a we

330
00:11:43,110 --> 00:11:40,690
believe this was the anti-fog prior to

331
00:11:45,480 --> 00:11:43,120
going out EBA each time the crew members

332
00:11:46,980 --> 00:11:45,490
apply an anti-fog solution to the inside

333
00:11:49,110 --> 00:11:46,990
of their helmet in order to prevent

334
00:11:50,639 --> 00:11:49,120
fogging and we've seen this happen a

335
00:11:52,769 --> 00:11:50,649
couple times in the past where if you're

336
00:11:54,510 --> 00:11:52,779
not careful about about buffing the

337
00:11:56,220 --> 00:11:54,520
anti-fog just the right amount that it

338
00:11:57,870 --> 00:11:56,230

can tend to flake off every once in a

339
00:11:59,699 --> 00:11:57,880
while and getting a crew members i and

340
00:12:01,440 --> 00:11:59,709
this anti fog is actually just off the

341
00:12:02,699 --> 00:12:01,450
shelf dishwashing soap so if you've ever

342
00:12:04,740 --> 00:12:02,709
had soap in your eye you know how that

343
00:12:06,120 --> 00:12:04,750
feels so add reported that he had

344
00:12:08,100 --> 00:12:06,130
something in his eye and it was it was

345
00:12:10,710 --> 00:12:08,110
burning quite a bit but it was you know

346
00:12:11,730 --> 00:12:10,720
a tiering quite a bit as well so he made

347
00:12:14,430 --> 00:12:11,740
an interesting comment that I never

348
00:12:16,199 --> 00:12:14,440
thought of before that tears in space

349
00:12:18,090 --> 00:12:16,209
don't run down your face they actually

350
00:12:19,440 --> 00:12:18,100
kind of conglomerate around your

351
00:12:20,940 --> 00:12:19,450
eyeballs so he was able to use the

352
00:12:23,460 --> 00:12:20,950
valsalva device that we have in their

353
00:12:24,750 --> 00:12:23,470
helmets to help them clear their ears as

354
00:12:26,250 --> 00:12:24,760
we're depressed in the airlock he was

355
00:12:28,500 --> 00:12:26,260
able to rub as I against that valsalva

356
00:12:30,480 --> 00:12:28,510
vice they'll selves a device to get that

357
00:12:32,430 --> 00:12:30,490
the tier free and then he said he was

358
00:12:33,930 --> 00:12:32,440
able to depress so he gave him as much

359
00:12:35,550 --> 00:12:33,940
time as he needed in order to say that

360
00:12:37,110 --> 00:12:35,560
he was good to go and once he informed

361
00:12:38,699 --> 00:12:37,120
us that hey you know I'm feeling a lot

362
00:12:41,040 --> 00:12:38,709
better we said all right let's let's

363
00:12:42,870 --> 00:12:41,050

head out to LC three so we translated

364
00:12:44,730 --> 00:12:42,880
out to you LC three on the port side of

365
00:12:46,290 --> 00:12:44,740
the truss drew worked on getting in

366
00:12:48,540 --> 00:12:46,300
position with his body restraint tether

367
00:12:51,480 --> 00:12:48,550
and then proceeded to take the infrared

368
00:12:53,250 --> 00:12:51,490
imagery of the stp h3 Vader experiment

369
00:12:54,269 --> 00:12:53,260
which was a late add to our flight so

370
00:12:56,100 --> 00:12:54,279
we're very glad that we are able to

371
00:12:58,019 --> 00:12:56,110
accommodate the DoD payload and get

372
00:13:00,150 --> 00:12:58,029
those photos so Mike even worked on

373
00:13:02,460 --> 00:13:00,160
installing mli multi-layer insulation

374
00:13:04,860 --> 00:13:02,470
cover on the grapple fixture on the gas

375
00:13:06,480 --> 00:13:04,870
tank on ELC three once they're complete

376
00:13:07,980 --> 00:13:06,490
with those tasks as Derek mentioned

377
00:13:09,630 --> 00:13:07,990
actually happened well I was a sleep

378
00:13:11,940 --> 00:13:09,640
overnight we discovered that a piece of

379
00:13:14,579 --> 00:13:11,950
multi-layer insulation on the CTC or the

380
00:13:17,340 --> 00:13:14,589
cargo the cargo transport carrier which

381
00:13:18,900 --> 00:13:17,350
is another oru that we have on the ELC

382
00:13:20,160 --> 00:13:18,910
that a piece of that multi-layer

383
00:13:21,570 --> 00:13:20,170
insulation to come loose and they had

384
00:13:23,430 --> 00:13:21,580
thermal concerns and that we needed to

385
00:13:25,350 --> 00:13:23,440
reinstall that multi-layer insulation so

386
00:13:27,300 --> 00:13:25,360
we were able to uplink the crew a few

387
00:13:28,980 --> 00:13:27,310
pictures overnight and before we were

388
00:13:30,870 --> 00:13:28,990

even able to to understand what he was

389
00:13:32,670 --> 00:13:30,880
doing drew said it was done no big deal

390
00:13:35,340 --> 00:13:32,680
so we were able to get that get ahead

391
00:13:37,050 --> 00:13:35,350
done as well at that point time it had

392
00:13:38,790 --> 00:13:37,060
already been you know a pretty long EV a

393
00:13:40,290 --> 00:13:38,800
so we said let's let's not even discuss

394
00:13:42,120 --> 00:13:40,300
any get a heads let's just work on

395
00:13:43,560 --> 00:13:42,130
getting back to the airlock so then we

396
00:13:46,890 --> 00:13:43,570
in grass and like I said it was a six

397
00:13:48,510 --> 00:13:46,900
hour and 54 minute EBA now we can answer

398
00:13:53,280 --> 00:13:48,520
some questions okay we'll start here

399
00:13:55,650 --> 00:13:53,290
question Ron Perlman with

400
00:13:59,160 --> 00:13:55,660
collectspace.com with regards to the

401
00:14:00,990 --> 00:13:59,170
late ad of the Vader imagery was that an

402
00:14:02,280 --> 00:14:01,000
Air Force request that came late or just

403
00:14:05,310 --> 00:14:02,290
an opportunity that presented itself

404
00:14:09,300 --> 00:14:05,320
later or how did it get added so within

405
00:14:11,310 --> 00:14:09,310
the last 24 hours it was a it was a DoD

406
00:14:15,000 --> 00:14:11,320
request that actually got added before

407
00:14:16,800 --> 00:14:15,010
we launched so it wasn't the CTC mli

408
00:14:18,570 --> 00:14:16,810
flap that she mentioned was the was the

409
00:14:19,950 --> 00:14:18,580
thing that we identified overnight just

410
00:14:25,020 --> 00:14:19,960
based on imagery that we've gotten from

411
00:14:27,660 --> 00:14:25,030
station we worked with the stp h3 folks

412
00:14:29,820 --> 00:14:27,670
the DoD folks probably a week before

413
00:14:31,950 --> 00:14:29,830

launch when they identified an issue you

414
00:14:33,570 --> 00:14:31,960
know basically issues with their ground

415
00:14:34,740 --> 00:14:33,580
processing had put their payload in a

416
00:14:36,480 --> 00:14:34,750
position that they didn't have the

417
00:14:39,570 --> 00:14:36,490
baseline data that they needed to gather

418
00:14:42,120 --> 00:14:39,580
information on orbit so by using this

419
00:14:44,250 --> 00:14:42,130
infrared photography as they change the

420
00:14:45,690 --> 00:14:44,260
modes of the payload we were able to get

421
00:14:47,790 --> 00:14:45,700
them the baseline data that they need

422
00:14:49,980 --> 00:14:47,800
they needed to have the payload be

423
00:14:52,380 --> 00:14:49,990
useful on orbit so although it was late

424
00:14:57,450 --> 00:14:52,390
it wasn't as late as the CTC mli plan

425
00:14:58,500 --> 00:14:57,460
and with regards to the 1553 cable is

426
00:15:02,640 --> 00:14:58,510
that something you're going to try for

427
00:15:04,470 --> 00:15:02,650
on ebay for or it will be now pitched to

428
00:15:08,070 --> 00:15:04,480
him stay GBA it's still on the table for

429
00:15:14,730 --> 00:15:08,080
e VA for our orbit 3 planning team as we

430
00:15:17,340 --> 00:15:14,740
speak is talking about that Denise Chow

431
00:15:18,930 --> 00:15:17,350
its face calm um with the aisle protocol

432
00:15:20,850 --> 00:15:18,940
um how long was that tested on the

433
00:15:23,220 --> 00:15:20,860
ground before you decided to try it this

434
00:15:24,720 --> 00:15:23,230
time around oh how long did you know I'm

435
00:15:26,610 --> 00:15:24,730
I truthfully I don't know how long it

436
00:15:27,900 --> 00:15:26,620
was tested I know that dr. Hearn hard

437
00:15:30,480 --> 00:15:27,910
was an astronaut who's been working on

438
00:15:31,950 --> 00:15:30,490

and almost all that the EV a pre-brief

439
00:15:32,240 --> 00:15:31,960
protocols has been working on this I'll

440
00:15:34,610 --> 00:15:32,250
pro

441
00:15:36,020 --> 00:15:34,620
for quite a few years now so it's been

442
00:15:39,050 --> 00:15:36,030
tested for why I know they did extensive

443
00:15:40,580 --> 00:15:39,060
testing at Duke University and then also

444
00:15:44,450 --> 00:15:40,590
just to follow up so if there had been

445
00:15:47,510 --> 00:15:44,460
no issue with tomtom co2 sensor in EV a1

446
00:15:49,210 --> 00:15:47,520
it would be a decision to use it for the

447
00:15:54,950 --> 00:15:49,220
4th thumb and final a spacewalk

448
00:15:57,340 --> 00:15:54,960
absolutely any other questions here well

449
00:16:03,920 --> 00:15:57,350
I go to the fridge then I'm Marcia been

450
00:16:07,820 --> 00:16:03,930
hi can hear me hi can you hear me yes we

451
00:16:09,800 --> 00:16:07,830
can yes first question for Alison thank

452
00:16:13,060 --> 00:16:09,810
you for all those spacewalk details I

453
00:16:15,950 --> 00:16:13,070
couldn't catch the type of device that

454
00:16:17,630 --> 00:16:15,960
true voice so used to rub his eye with

455
00:16:19,390 --> 00:16:17,640
you said it so fast there could you tell

456
00:16:21,650 --> 00:16:19,400
me what that is and I have a follow-up

457
00:16:24,110 --> 00:16:21,660
ok this is sorry about that I do talk

458
00:16:25,520 --> 00:16:24,120
fast it's a valsalva device so i think

459
00:16:27,860 --> 00:16:25,530
they call it a vile saw the maneuver

460
00:16:31,490 --> 00:16:27,870
when you try to clear your ears and so

461
00:16:33,650 --> 00:16:31,500
it looks kind of it's a foam block that

462
00:16:35,300 --> 00:16:33,660
they adhere to the inside of their visor

463
00:16:36,500 --> 00:16:35,310

and then if they have issues clearing

464
00:16:37,850 --> 00:16:36,510
their ears normally if you're in an

465
00:16:39,560 --> 00:16:37,860
airplane you have issues you just pinch

466
00:16:40,940 --> 00:16:39,570
your nose this kind of serves the same

467
00:16:43,010 --> 00:16:40,950
purpose where you can just kind of wed

468
00:16:45,050 --> 00:16:43,020
your nose down into the valsalva device

469
00:16:46,490 --> 00:16:45,060
to clear your ears so he was able to

470
00:16:48,079 --> 00:16:46,500
actually wiggle down low enough in his

471
00:16:50,930 --> 00:16:48,089
suit that he could rub his eye on that

472
00:16:53,930 --> 00:16:50,940
valsalva device oh thank you and a

473
00:16:56,960 --> 00:16:53,940
question for Derek please I'm just

474
00:16:59,840 --> 00:16:56,970
wondering what the status is if to your

475
00:17:02,360 --> 00:16:59,850
knowledge of the post undog pictures

476
00:17:04,069 --> 00:17:02,370
that the Soyuz took there's some rumors

477
00:17:06,500 --> 00:17:04,079
on the internet about how that that

478
00:17:08,270 --> 00:17:06,510
digital pictures may have been lost I'm

479
00:17:10,460 --> 00:17:08,280
just wanted looking for a status on what

480
00:17:12,439 --> 00:17:10,470
you know about it I thought that

481
00:17:15,350 --> 00:17:12,449
question might come up so I got a status

482
00:17:20,059 --> 00:17:15,360
before I came in here and the the

483
00:17:22,220 --> 00:17:20,069
imagery from the 25's photographs are on

484
00:17:23,870 --> 00:17:22,230
the Soyuz still in the Soyuz and they'll

485
00:17:25,670 --> 00:17:23,880
be transported to Moscow with all the

486
00:17:28,160 --> 00:17:25,680
other return cargo and they'll be

487
00:17:30,020 --> 00:17:28,170
processed as part of that cargo my

488
00:17:33,560 --> 00:17:30,030

understanding is that will have access

489
00:17:36,410 --> 00:17:33,570
to the imagery in about a week thank you

490
00:17:38,030 --> 00:17:36,420
to your knowledge it's safe inside the

491
00:17:41,549 --> 00:17:38,040
so you still no reason to believe that

492
00:17:46,210 --> 00:17:41,559
it got lost or damaged that's correct

493
00:17:50,020 --> 00:17:46,220
next on the line is marker oh yeah I had

494
00:17:54,610 --> 00:17:50,030
a question about the PDGF and I wondered

495
00:18:01,570 --> 00:17:54,620
how you imagined it might be used with

496
00:18:07,720 --> 00:18:01,580
the space station hello in terms of the

497
00:18:09,580 --> 00:18:07,730
FGB PDGF mark one example is you know

498
00:18:12,210 --> 00:18:09,590
there-there's scenarios in which we

499
00:18:15,880 --> 00:18:12,220
would relocate the pmm and the folks

500
00:18:18,580 --> 00:18:15,890
analyzing that that operation think that

501
00:18:22,930 --> 00:18:18,590
that fgb PDGF might be an ideal base for

502
00:18:26,190 --> 00:18:22,940
the SS rms to do that p mm relocate it

503
00:18:28,810 --> 00:18:26,200
also gives us access we don't have now

504
00:18:31,450 --> 00:18:28,820
two areas on the aft end of the segment

505
00:18:33,310 --> 00:18:31,460
on the on f10 and the station on the

506
00:18:35,020 --> 00:18:33,320
Russian segment so it gives us some

507
00:18:37,950 --> 00:18:35,030
flexibility and some additional reach

508
00:18:40,890 --> 00:18:37,960
with the space station robotic arm

509
00:18:43,570 --> 00:18:40,900
thanks very much and this is the only

510
00:18:46,810 --> 00:18:43,580
PDGF on the Russian segment or is there

511
00:18:50,680 --> 00:18:46,820
another this will be the only PDGF on

512
00:18:54,640 --> 00:18:50,690
the Russian segment thank you next is

513
00:18:56,470 --> 00:18:54,650

Charles Atkinson the afternoon can you

514
00:18:59,680 --> 00:18:56,480
discuss the communication issue which

515
00:19:04,930 --> 00:18:59,690
pilot Johnson spoke of post UVA related

516
00:19:06,669 --> 00:19:04,940
to the quest airlock I'll have to check

517
00:19:08,860 --> 00:19:06,679
and see exactly what issue we discussed

518
00:19:11,740 --> 00:19:08,870
I may have been doing a hand over her

519
00:19:13,630 --> 00:19:11,750
off console so I am not aware of any

520
00:19:16,899 --> 00:19:13,640
communication issue that occurred today

521
00:19:18,700 --> 00:19:16,909
I know in our communication with the

522
00:19:21,970 --> 00:19:18,710
astronauts throughout the day was good

523
00:19:23,860 --> 00:19:21,980
there's times when just due to satellite

524
00:19:25,899 --> 00:19:23,870
coverage we switch back and forth

525
00:19:29,350 --> 00:19:25,909
between the space station loops and the

526
00:19:31,210 --> 00:19:29,360
and the shuttle communication loops but

527
00:19:32,529 --> 00:19:31,220
i'm certainly not aware of any any

528
00:19:34,630 --> 00:19:32,539
failure that occurred today that

529
00:19:38,320 --> 00:19:34,640
affected our ability to conduct the

530
00:19:39,940 --> 00:19:38,330
spacewalk which was a calm issue that

531
00:19:44,169 --> 00:19:39,950
Johnson spoke but between a bleak

532
00:19:46,419 --> 00:19:44,179
endeavor and the airlock it was a bit of

533
00:19:49,450 --> 00:19:46,429
chatter on it by post deviate between

534
00:19:51,549 --> 00:19:49,460
Harbaugh Johnson and those who might

535
00:19:54,640 --> 00:19:51,559
that they were unsure how to resolve it

536
00:20:03,720 --> 00:19:54,650
or what to fix the issue okay I concern

537
00:20:12,220 --> 00:20:08,140
todd halvorson floated today Derek I

538
00:20:17,320 --> 00:20:12,230

heard you mention that there was an EBA

539
00:20:19,690 --> 00:20:17,330
a single EV a planned on sts-135 and

540
00:20:22,360 --> 00:20:19,700
I've been under the mistaken impression

541
00:20:24,880 --> 00:20:22,370
that there were no EVs on that mission

542
00:20:28,360 --> 00:20:24,890
could you tell me when that got one got

543
00:20:31,180 --> 00:20:28,370
added and what the content is if you

544
00:20:33,550 --> 00:20:31,190
know thanks yeah I'm not the right guy

545
00:20:39,520 --> 00:20:33,560
to ask that question all right honestly

546
00:20:41,440 --> 00:20:39,530
I'm not for me with the timeline just to

547
00:20:47,140 --> 00:20:41,450
follow real quickly though there is a

548
00:20:50,650 --> 00:20:47,150
EBA on 135 so the 4th EBA on 134 will

549
00:20:56,950 --> 00:20:50,660
not be the last in the shuttle program

550
00:20:59,470 --> 00:20:56,960
thanks and the dba's plan for sts-135

551
00:21:01,720 --> 00:20:59,480
will be conducted by the increment crew

552
00:21:06,130 --> 00:21:01,730
members on board they won't be conducted

553
00:21:12,640 --> 00:21:06,140
by the space shuttle astronauts ok so

554
00:21:15,040 --> 00:21:12,650
the 40 VA on sts-134 will in fact be the

555
00:21:17,050 --> 00:21:15,050
one last ones conducted by space shuttle

556
00:21:20,260 --> 00:21:17,060
astronauts is that correct that is

557
00:21:25,360 --> 00:21:20,270
correct thanks very much that's all I

558
00:21:27,370 --> 00:21:25,370
have ok bill Harwood thanks I got to one

559
00:21:30,460 --> 00:21:27,380
quick follow tomorrow's question for

560
00:21:32,920 --> 00:21:30,470
Derek is there a a specific job that the

561
00:21:35,230 --> 00:21:32,930
PDGF on Azaria is being put there for is

562
00:21:38,710 --> 00:21:35,240
it just simply in case it's needed down

563
00:21:40,510 --> 00:21:38,720

the road it's both the one specific

564
00:21:43,290 --> 00:21:40,520
thing that they're looking at using that

565
00:21:46,330 --> 00:21:43,300
PDGF for is a future pmm relocation

566
00:21:48,520 --> 00:21:46,340
beyond that it's just flexibility and

567
00:21:50,440 --> 00:21:48,530
access especially when you consider the

568
00:21:53,140 --> 00:21:50,450
fact that ani ba for will leave the boom

569
00:21:57,340 --> 00:21:53,150
on station so the boom combined with SS

570
00:22:00,390 --> 00:21:57,350
RMS and that FG bfg BPD GF gives you

571
00:22:02,950 --> 00:22:00,400
reach you know up and down the station

572
00:22:04,840 --> 00:22:02,960
thanks and one for either one of you i'm

573
00:22:06,340 --> 00:22:04,850
not sure what I was just I was thinking

574
00:22:07,779 --> 00:22:06,350
about this earlier today that the you

575
00:22:09,399 --> 00:22:07,789
know President Reagan

576
00:22:10,509 --> 00:22:09,409
announced the space station program back

577
00:22:13,629 --> 00:22:10,519
in nineteen eighty four twenty-seven

578
00:22:15,549 --> 00:22:13,639
years ago and you guys have now done 150

579
00:22:18,269 --> 00:22:15,559
a TVA is to put this thing together and

580
00:22:20,919 --> 00:22:18,279
it's done basically one more shuttle EPA

581
00:22:24,039 --> 00:22:20,929
do you don't even have any way of giving

582
00:22:26,229 --> 00:22:24,049
us just a sense of the capability you

583
00:22:27,820 --> 00:22:26,239
guys have spacewalk wise now that you

584
00:22:29,200 --> 00:22:27,830
didn't have when this project started I

585
00:22:30,729 --> 00:22:29,210
realize that you could write a book

586
00:22:33,340 --> 00:22:30,739
about that but is there anything you

587
00:22:35,049 --> 00:22:33,350
could say in general terms about how far

588
00:22:37,029 --> 00:22:35,059

you guys have come over those last three

589
00:22:38,560 --> 00:22:37,039
decades of the decision to build the

590
00:22:43,359 --> 00:22:38,570
station and going and actually doing it

591
00:22:45,729 --> 00:22:43,369
thanks i can start you go yeah i mean

592
00:22:48,399 --> 00:22:45,739
that this is well before allison's time

593
00:22:51,700 --> 00:22:48,409
but i mean in i started in nineteen

594
00:22:53,379 --> 00:22:51,710
ninety as a as a thermal operations and

595
00:22:55,210 --> 00:22:53,389
resources flight control or a Thor

596
00:22:57,009 --> 00:22:55,220
flight controller on the station side

597
00:23:00,129 --> 00:22:57,019
and of course that was that was well

598
00:23:01,869 --> 00:23:00,139
before we had flown any hardware and I'm

599
00:23:05,499 --> 00:23:01,879
as i'm sure you're you're probably where

600
00:23:07,539 --> 00:23:05,509
velde you know the assembly plans for

601
00:23:09,489 --> 00:23:07,549
the station train changed dramatically

602
00:23:12,659 --> 00:23:09,499
from that nineteen ninety to ninety six

603
00:23:16,139 --> 00:23:12,669
timeframe when folks realized that that

604
00:23:18,099 --> 00:23:16,149
that the original plans just were not

605
00:23:19,839 --> 00:23:18,109
supportable in terms of the amount of

606
00:23:21,639 --> 00:23:19,849
space walks in the amount of evi hours

607
00:23:24,460 --> 00:23:21,649
it would be required so there was a

608
00:23:26,320 --> 00:23:24,470
significant redesign done to make the

609
00:23:29,379 --> 00:23:26,330
the modules and the trust segments more

610
00:23:31,269 --> 00:23:29,389
module modular you know kind of plug and

611
00:23:33,099 --> 00:23:31,279
play without a lot of it assembly

612
00:23:35,259 --> 00:23:33,109
required by the space station or by the

613
00:23:37,690 --> 00:23:35,269

spacewalking astronauts but even then i

614
00:23:39,729 --> 00:23:37,700
can remember you know in the in the mid

615
00:23:41,619 --> 00:23:39,739
90s or mid to late nineties when we

616
00:23:44,049 --> 00:23:41,629
started looking at the details of the

617
00:23:46,889 --> 00:23:44,059
assembly sequence and once the design

618
00:23:49,599 --> 00:23:46,899
had been solidified and finalized that

619
00:23:50,889 --> 00:23:49,609
there was a lot of concern about the

620
00:23:52,509 --> 00:23:50,899
amount of space walk so we're going to

621
00:23:54,430 --> 00:23:52,519
have to be conducted and i remember

622
00:23:58,359 --> 00:23:54,440
there was a term called the wall of ebas

623
00:24:00,430 --> 00:23:58,369
and it was just this unbelievable step

624
00:24:02,589 --> 00:24:00,440
up in terms of the amount of task that

625
00:24:04,839 --> 00:24:02,599
we do and the number of epa's that we do

626
00:24:07,659 --> 00:24:04,849
and again as i'm sure you're aware in

627
00:24:10,180 --> 00:24:07,669
the early shuttle program a flight with

628
00:24:12,519 --> 00:24:10,190
one or two EVs was considered a pretty

629
00:24:15,339 --> 00:24:12,529
challenging mission and something that

630
00:24:17,109 --> 00:24:15,349
was going to be difficult to go do now

631
00:24:20,499 --> 00:24:17,119
with these with these station missions

632
00:24:21,010 --> 00:24:20,509
we fly today with three and four EV a's

633
00:24:22,690 --> 00:24:21,020
the know

634
00:24:24,400 --> 00:24:22,700
warm and then when you when you factor

635
00:24:26,410 --> 00:24:24,410
in all the robotics that we do in the

636
00:24:29,140 --> 00:24:26,420
background including ground control

637
00:24:31,450 --> 00:24:29,150
robotics overnight between e va's i mean

638
00:24:33,370 --> 00:24:31,460

the the difference in the upgrade and

639
00:24:35,320 --> 00:24:33,380
the capability is just difficult to

640
00:24:38,410 --> 00:24:35,330
quantify but just tremendous the things

641
00:24:41,260 --> 00:24:38,420
we do today if you went back mid 90s

642
00:24:43,300 --> 00:24:41,270
early 90s and talked about doing it yeah

643
00:24:45,430 --> 00:24:43,310
there's just no comparison really it is

644
00:24:47,140 --> 00:24:45,440
amazing what these guys can train the

645
00:24:52,960 --> 00:24:47,150
crew to go do and it's amazing what the

646
00:24:54,490 --> 00:24:52,970
the crews can pull off these days that

647
00:24:55,750 --> 00:24:54,500
sounds like the end of the questions on

648
00:24:58,840 --> 00:24:55,760
the form bridge are there any follow-ups

649
00:25:00,640 --> 00:24:58,850
here no well go ahead and wrap up the

650
00:25:02,620 --> 00:25:00,650
briefing with a few programming notes we

651
00:25:04,300 --> 00:25:02,630
do have the videos from the solid rocket

652
00:25:06,070 --> 00:25:04,310
boosters to begin playing that on NASA

653
00:25:09,190 --> 00:25:06,080
television today so that will start at

654
00:25:10,840 --> 00:25:09,200
11 a.m. central time and then the flight

655
00:25:13,870 --> 00:25:10,850
day 10 video highlights will start at

656
00:25:16,060 --> 00:25:13,880
noon we have a video file of the

657
00:25:17,770 --> 00:25:16,070
expedition 28 crew getting ready for

658
00:25:20,380 --> 00:25:17,780
their launch to the station with a

659
00:25:23,290 --> 00:25:20,390
departure to Kazakhstan that's it 1 p.m.

660
00:25:26,680 --> 00:25:23,300
central time including some more replays

661
00:25:29,890 --> 00:25:26,690
of SRV of videos we have the ISIS flight

662
00:25:32,020 --> 00:25:29,900
director update at 4 45 p.m. the shuttle

663
00:25:35,830 --> 00:25:32,030

crew and station crews are scheduled to

664
00:25:37,270 --> 00:25:35,840
wake together at 656 p.m. and they'll be

665
00:25:38,830 --> 00:25:37,280
doing the late inspection overnight and

666
00:25:41,650 --> 00:25:38,840
we also have the joint crew news

667
00:25:44,170 --> 00:25:41,660
conference overnight it's at 442 a.m.

668
00:25:45,880 --> 00:25:44,180
central time and just a reminder for

669
00:25:47,920 --> 00:25:45,890
reporters that the phone bridge will not

670
00:25:50,170 --> 00:25:47,930
be activated during that so you need to

671
00:25:52,510 --> 00:25:50,180
be at a NASA participating center for