
PAO

1
00:00:04,760 --> 00:00:03,290
this is Mission Control Houston welcome

2
00:00:06,200 --> 00:00:04,770
to the International Space Station

3
00:00:08,210 --> 00:00:06,210
flight control room again that was a

4
00:00:10,940 --> 00:00:08,220
video replay from a downlink earlier

5
00:00:13,549 --> 00:00:10,950
yesterday from the commander dan burbank

6
00:00:15,650 --> 00:00:13,559
and here with us today we have our very

7
00:00:17,930 --> 00:00:15,660
special guest astronaut Mike Fossum

8
00:00:20,960 --> 00:00:17,940
welcome Mike hey it's great to be back

9
00:00:22,700 --> 00:00:20,970
at me go good and so Mike was is a

10
00:00:24,320 --> 00:00:22,710
veteran of three space wise the most

11
00:00:25,730 --> 00:00:24,330
recent flight was aboard the

12
00:00:28,310 --> 00:00:25,740
International Space Station he was the

13
00:00:30,169 --> 00:00:28,320

commander of expedition 29 he was

14
00:00:32,389 --> 00:00:30,179
actually up there and handed over it as

15
00:00:34,160 --> 00:00:32,399
you heard in the video and then talked

16
00:00:36,530 --> 00:00:34,170
about a little bit about that hand over

17
00:00:39,139 --> 00:00:36,540
and so Mike was actually there when Dan

18
00:00:40,430 --> 00:00:39,149
arrived and had a very quick hand over

19
00:00:42,319 --> 00:00:40,440
it was one of the guys handing over to

20
00:00:43,880 --> 00:00:42,329
him it was great this video was great I

21
00:00:46,310 --> 00:00:43,890
really loved it because it's such a

22
00:00:47,660 --> 00:00:46,320
great description from Dan about what

23
00:00:49,549 --> 00:00:47,670
it's like to live up there to come

24
00:00:51,080 --> 00:00:49,559
aboard and to have a very quick hand

25
00:00:53,720 --> 00:00:51,090
over like you said we really only had

26
00:00:55,459 --> 00:00:53,730
about four days to pass over as much as

27
00:00:58,670 --> 00:00:55,469
we could and show him how things worked

28
00:01:01,130 --> 00:00:58,680
and where we had hidden things and get

29
00:01:02,930 --> 00:01:01,140
ready ourselves to leave and so it's

30
00:01:04,399 --> 00:01:02,940
it's great seeing the video in his whole

31
00:01:06,380 --> 00:01:04,409
description of what it's like to live

32
00:01:08,929 --> 00:01:06,390
and work up there for a long period of

33
00:01:11,090 --> 00:01:08,939
time and kind of looking back now as he

34
00:01:13,460 --> 00:01:11,100
said nearing the last the last few weeks

35
00:01:16,399 --> 00:01:13,470
and getting ready to come home okay so

36
00:01:17,690 --> 00:01:16,409
what so he is now just a little more

37
00:01:20,090 --> 00:01:17,700
than a week and you were there about a

38
00:01:22,249 --> 00:01:20,100

week when he did arrive so talk to me a

39
00:01:23,960 --> 00:01:22,259
little about that last week I mean you

40
00:01:25,730 --> 00:01:23,970
obviously had a little more crew prep

41
00:01:27,350 --> 00:01:25,740
because you had handover activities as

42
00:01:29,600 --> 00:01:27,360
well but talk to me about some of your

43
00:01:31,520 --> 00:01:29,610
thoughts and and whatnot before yes

44
00:01:33,590 --> 00:01:31,530
what's going on right now is really is

45
00:01:36,440 --> 00:01:33,600
it and I've talked to Dan I talked to

46
00:01:38,330 --> 00:01:36,450
him twice last weekend they're getting

47
00:01:41,450 --> 00:01:38,340
ready to mean to come home he sees

48
00:01:44,210 --> 00:01:41,460
starting to pack things up and and you

49
00:01:45,830 --> 00:01:44,220
know and and you know putting those last

50
00:01:47,210 --> 00:01:45,840
few things that he really wanted to do

51
00:01:49,429 --> 00:01:47,220
there at the very top of his own

52
00:01:52,340 --> 00:01:49,439
personal to-do list he's trying to get a

53
00:01:53,600 --> 00:01:52,350
couple of those things done and he said

54
00:01:55,639 --> 00:01:53,610
I know that he's spending a little extra

55
00:01:57,410 --> 00:01:55,649
time with Don and Andre to say okay

56
00:01:59,359 --> 00:01:57,420
let's make sure we're really you know

57
00:02:00,469 --> 00:01:59,369
you guys really know everything that you

58
00:02:02,209 --> 00:02:00,479
need to know and of course they do

59
00:02:04,280 --> 00:02:02,219
they've been there since December also

60
00:02:06,040 --> 00:02:04,290
so they're ready there'll be a little

61
00:02:08,020 --> 00:02:06,050
bit nervous though knowing I

62
00:02:10,180 --> 00:02:08,030
you know how I felt even after spending

63
00:02:13,660 --> 00:02:10,190

months up there as I was taken over from

64
00:02:15,190 --> 00:02:13,670
ron garan but part of its just getting

65
00:02:18,040 --> 00:02:15,200
on getting your things you don't have a

66
00:02:20,110 --> 00:02:18,050
lot of stuff but you really owe it to

67
00:02:22,540 --> 00:02:20,120
the to the people that are following

68
00:02:24,250 --> 00:02:22,550
behind you to take care of your stuff to

69
00:02:26,290 --> 00:02:24,260
get things packed up and to get a lot of

70
00:02:28,300 --> 00:02:26,300
it actually thrown away because we don't

71
00:02:30,220 --> 00:02:28,310
have a way to return clothes or even

72
00:02:32,050 --> 00:02:30,230
wash them so things like clothes or are

73
00:02:34,030 --> 00:02:32,060
actually thrown away when you're done

74
00:02:35,500 --> 00:02:34,040
with them and so those are our pact on

75
00:02:37,000 --> 00:02:35,510
I'm sure a lot of them are packed on

76
00:02:38,770 --> 00:02:37,010
that progress vehicle that's leaving

77
00:02:40,600 --> 00:02:38,780
tomorrow morning they have that thing

78
00:02:42,400 --> 00:02:40,610
packed full of trash right to the point

79
00:02:44,160 --> 00:02:42,410
of just barely being able to operate the

80
00:02:46,090 --> 00:02:44,170
hatch I know how that stuff works

81
00:02:47,590 --> 00:02:46,100
speaking as they just closed those

82
00:02:49,570 --> 00:02:47,600
hatches and they're performing the leak

83
00:02:51,310 --> 00:02:49,580
checks now we'll get into some of that

84
00:02:52,810 --> 00:02:51,320
in a little bit so let's talk about some

85
00:02:54,760 --> 00:02:52,820
of these activities that are taking

86
00:02:56,050 --> 00:02:54,770
place on the International Space Station

87
00:02:57,430 --> 00:02:56,060
I think the last time you not talk there

88
00:02:58,990 --> 00:02:57,440

was a lot going on it seems like there's

89
00:03:00,580 --> 00:02:59,000
a lot going on always a lot going on

90
00:03:03,670 --> 00:03:00,590
that's what I'm beginning to understand

91
00:03:05,400 --> 00:03:03,680
you're so first of all commander Burbank

92
00:03:07,510 --> 00:03:05,410
is working on a remove and replace

93
00:03:09,250 --> 00:03:07,520
replacement of the hydrogen sensor and

94
00:03:10,840 --> 00:03:09,260
this is of the oxygen generator system

95
00:03:13,800 --> 00:03:10,850
can you talk to me a little about this

96
00:03:18,220 --> 00:03:13,810
system takes water and then through a

97
00:03:20,890 --> 00:03:18,230
hydrolysis it splits the water into

98
00:03:22,630 --> 00:03:20,900
hydrogen and oxygen and we have to make

99
00:03:25,449 --> 00:03:22,640
sure that those stay separated and

100
00:03:27,250 --> 00:03:25,459
there's a hydrogen sensor in there that

101
00:03:28,960 --> 00:03:27,260
needs to be replaced periodically and

102
00:03:31,270 --> 00:03:28,970
it's kind of a fussy procedure with a

103
00:03:33,850 --> 00:03:31,280
lot of odd things we don't use very

104
00:03:36,370 --> 00:03:33,860
often something that I'm excited about

105
00:03:38,170 --> 00:03:36,380
today is that the ground has prepared a

106
00:03:40,000 --> 00:03:38,180
training video which is actually

107
00:03:42,520 --> 00:03:40,010
inserted right into the beginning of his

108
00:03:45,820 --> 00:03:42,530
procedures open up a little five-minute

109
00:03:46,720 --> 00:03:45,830
video as refresher training and I think

110
00:03:48,570 --> 00:03:46,730
this is going to be really really

111
00:03:52,420 --> 00:03:48,580
valuable it's going to help us be more

112
00:03:55,000 --> 00:03:52,430
efficient and on orbit to have just this

113
00:03:57,280 --> 00:03:55,010

little video thing similar to today if

114
00:03:59,770 --> 00:03:57,290
you've got to do some work on a car or a

115
00:04:01,600 --> 00:03:59,780
piece of something around the house if

116
00:04:03,699 --> 00:04:01,610
you do in quick internet search you can

117
00:04:06,490 --> 00:04:03,709
find videos on how to do things you

118
00:04:08,979 --> 00:04:06,500
never even been trained on undoing but

119
00:04:10,930 --> 00:04:08,989
you can watch a video see somebody else

120
00:04:12,699 --> 00:04:10,940
doing it then the written procedure

121
00:04:14,620 --> 00:04:12,709
makes sense and you can figure it out

122
00:04:17,620 --> 00:04:14,630
and so that's kind of what we're

123
00:04:19,759 --> 00:04:17,630
evaluating today is dams ability to do

124
00:04:22,550 --> 00:04:19,769
this this

125
00:04:24,890 --> 00:04:22,560
little maintenance activity with the

126
00:04:29,180 --> 00:04:24,900
training that he had a year or maybe

127
00:04:31,100 --> 00:04:29,190
more ago but proceeded the activity with

128
00:04:32,990 --> 00:04:31,110
just a few minutes of video to review it

129
00:04:34,640 --> 00:04:33,000
and I can't wait to hear is a commentary

130
00:04:37,460 --> 00:04:34,650
on that I I watched the video myself

131
00:04:39,649 --> 00:04:37,470
yesterday I did this procedure also on

132
00:04:42,020 --> 00:04:39,659
orbit while I was there did you find it

133
00:04:43,610 --> 00:04:42,030
and i think the videos can be queried I

134
00:04:45,439 --> 00:04:43,620
can't hear I can't wait to hear what the

135
00:04:47,180 --> 00:04:45,449
crew has to say about it that's a great

136
00:04:49,070 --> 00:04:47,190
idea and I can't imagine that that

137
00:04:50,450 --> 00:04:49,080
wouldn't be useful to them so every good

138
00:04:53,089 --> 00:04:50,460

to hear from that now know they have

139
00:04:55,909 --> 00:04:53,099
about three and a half hours schedule of

140
00:04:57,710 --> 00:04:55,919
work time to do that so it does sound

141
00:05:03,770 --> 00:04:57,720
like tedious I bet dance done into an

142
00:05:05,719 --> 00:05:03,780
act so and other things that are going

143
00:05:09,189 --> 00:05:05,729
on pretty exciting stuff Pettit and

144
00:05:12,559 --> 00:05:09,199
Kuiper's are actually working on a

145
00:05:14,839 --> 00:05:12,569
onboard training session with the mainly

146
00:05:16,790 --> 00:05:14,849
a practice session with the robotic arm

147
00:05:19,219 --> 00:05:16,800
they're working with Canada arm to to

148
00:05:21,260 --> 00:05:19,229
grapple the dragon SpaceX's dragon that

149
00:05:22,820 --> 00:05:21,270
set to launch on April thirtieth talk to

150
00:05:24,920 --> 00:05:22,830
me some of them oh yeah this is this

151
00:05:27,830 --> 00:05:24,930
exciting getting ready for that for the

152
00:05:30,920 --> 00:05:27,840
dragon grapple and this is a change in

153
00:05:33,589 --> 00:05:30,930
crew responsibilities because we the

154
00:05:37,580 --> 00:05:33,599
they were planning to catch the the

155
00:05:39,920 --> 00:05:37,590
space exploration cargo vehicle which

156
00:05:41,029 --> 00:05:39,930
has named the dragon was supposed to

157
00:05:44,269 --> 00:05:41,039
arrive a little bit ago it's been

158
00:05:46,370 --> 00:05:44,279
delayed some and so don pettit is

159
00:05:50,240 --> 00:05:46,380
getting will be the prime arm operator

160
00:05:51,769 --> 00:05:50,250
for that we call it a grab just in a way

161
00:05:54,260 --> 00:05:51,779
of talking about it but what happens

162
00:05:57,379 --> 00:05:54,270
here is that dragon vehicle will fly up

163
00:05:59,600 --> 00:05:57,389

and hover right in formation right

164
00:06:02,089 --> 00:05:59,610
underneath the space station just 10

165
00:06:04,159 --> 00:06:02,099
meters out this is really a cool it's a

166
00:06:06,769 --> 00:06:04,169
minute it's a very complicated maneuver

167
00:06:09,709 --> 00:06:06,779
this is a new ship and so this is the

168
00:06:11,240 --> 00:06:09,719
first of a kind and we can do a lot of

169
00:06:12,769 --> 00:06:11,250
simulations and a lot of training on a

170
00:06:15,110 --> 00:06:12,779
lot of things but it really boils down

171
00:06:16,730 --> 00:06:15,120
to the ability of that that dragon

172
00:06:19,700 --> 00:06:16,740
vehicle to maintain a very steady

173
00:06:23,089 --> 00:06:19,710
position and then Don with andre's

174
00:06:25,399 --> 00:06:23,099
assistance will be using the SS rms the

175
00:06:28,700 --> 00:06:25,409
big space station arm built in Canada to

176
00:06:30,590 --> 00:06:28,710
reach out and grab the grapple fixture a

177
00:06:34,370 --> 00:06:30,600
little pin that's on that

178
00:06:36,440 --> 00:06:34,380
on that the spacecraft to and then they

179
00:06:38,030 --> 00:06:36,450
will once they get it on the arm then

180
00:06:40,340 --> 00:06:38,040
they'll feel them and maneuver it and

181
00:06:42,980 --> 00:06:40,350
install it what they're doing today is

182
00:06:45,050 --> 00:06:42,990
actually flying the big arm manual

183
00:06:48,140 --> 00:06:45,060
flying and this is great stuff because

184
00:06:50,180 --> 00:06:48,150
it's it's I mean it's real flying and

185
00:06:52,340 --> 00:06:50,190
there's there's there's there's a target

186
00:06:55,430 --> 00:06:52,350
on the side of the space station and

187
00:06:58,130 --> 00:06:55,440
they're setting the arm up so it's it's

188
00:07:00,650 --> 00:06:58,140

it's not directly over that target it's

189
00:07:03,470 --> 00:07:00,660
at an offset so the crew has to manually

190
00:07:06,710 --> 00:07:03,480
fly the fly the arm to get it centered

191
00:07:09,440 --> 00:07:06,720
up and then fly in / the pin and that's

192
00:07:14,000 --> 00:07:09,450
exactly the kind of maneuver they'll be

193
00:07:17,000 --> 00:07:14,010
doing on about mace mace second or so

194
00:07:19,670 --> 00:07:17,010
when the when the dragon vehicle is up

195
00:07:21,980 --> 00:07:19,680
there ready for the grab and I

196
00:07:24,110 --> 00:07:21,990
understand this is the third time for

197
00:07:26,990 --> 00:07:24,120
the station arm to be used to actually

198
00:07:29,240 --> 00:07:27,000
grapple a free flying spacecraft that's

199
00:07:31,370 --> 00:07:29,250
pretty exciting as well and I understand

200
00:07:33,200 --> 00:07:31,380
now the mission itself of Dragon can you

201
00:07:35,780 --> 00:07:33,210
talk to me about that is basically to

202
00:07:38,660 --> 00:07:35,790
see and to test whether we can fly

203
00:07:40,760 --> 00:07:38,670
commercial small craft up to the energy

204
00:07:43,520 --> 00:07:40,770
presentations this is a big test for the

205
00:07:45,800 --> 00:07:43,530
first two free fliers were Japanese HTV

206
00:07:48,920 --> 00:07:45,810
vehicles and nicole stott and Cady

207
00:07:52,340 --> 00:07:48,930
Coleman were the primum operators for

208
00:07:53,990 --> 00:07:52,350
those two grabs and so this is this is

209
00:07:56,300 --> 00:07:54,000
the third vehicle but it is a different

210
00:07:57,740 --> 00:07:56,310
or it's a third time we do this kind of

211
00:07:59,870 --> 00:07:57,750
operation but it is a different vehicle

212
00:08:02,090 --> 00:07:59,880
so everybody looks forward to just

213
00:08:05,870 --> 00:08:02,100

seeing how how it performs as it gets in

214
00:08:09,410 --> 00:08:05,880
close and now the this is the also the

215
00:08:11,480 --> 00:08:09,420
first of the us-built commercial cargo

216
00:08:13,840 --> 00:08:11,490
vehicles which were built specifically

217
00:08:16,760 --> 00:08:13,850
to bring cargo up to the space station

218
00:08:18,950 --> 00:08:16,770
by a US carrier that's the first time we

219
00:08:24,170 --> 00:08:18,960
have that we have the russian progress

220
00:08:26,150 --> 00:08:24,180
the Japanese HTV and the European a TV

221
00:08:28,070 --> 00:08:26,160
which we have the third of the ATV

222
00:08:30,410 --> 00:08:28,080
vehicles is docked to the station right

223
00:08:33,800 --> 00:08:30,420
now so this is now the next US

224
00:08:35,719 --> 00:08:33,810
capability the SpaceX Dragon and now

225
00:08:38,150 --> 00:08:35,729
hopefully followed soon by the orbital

226
00:08:41,980 --> 00:08:38,160
sickness in a few months also so so talk

227
00:08:45,519 --> 00:08:41,990
to me bring about wise food clothing

228
00:08:47,470 --> 00:08:45,529
medical equipment new experiments those

229
00:08:48,970 --> 00:08:47,480
kind of things I don't have the numbers

230
00:08:50,500 --> 00:08:48,980
on the tip of my tongue but it's over a

231
00:08:53,740 --> 00:08:50,510
thousand pounds of equipment that's

232
00:08:55,750 --> 00:08:53,750
coming up in the on the dragon that's

233
00:08:57,070 --> 00:08:55,760
great well and so it is in points that

234
00:08:58,570 --> 00:08:57,080
that's what I was going to ask uses to

235
00:09:00,160 --> 00:08:58,580
describe the importance of that and

236
00:09:01,990 --> 00:09:00,170
obviously the critical point you know we

237
00:09:04,630 --> 00:09:02,000
have different ways of getting cargo up

238
00:09:06,370 --> 00:09:04,640

there but we we need to get this this

239
00:09:08,019 --> 00:09:06,380
next capability online and it's been a

240
00:09:11,050 --> 00:09:08,029
real challenge for the private companies

241
00:09:12,820 --> 00:09:11,060
that have have you know have been very

242
00:09:16,780 --> 00:09:12,830
anxious to get into this business and

243
00:09:19,090 --> 00:09:16,790
with NASA's support and an encouragement

244
00:09:21,280 --> 00:09:19,100
and and financial incentives these

245
00:09:22,570 --> 00:09:21,290
companies are coming into the into the

246
00:09:24,280 --> 00:09:22,580
business into the game and they're

247
00:09:26,290 --> 00:09:24,290
they're ready that we've had the Flight

248
00:09:28,630 --> 00:09:26,300
Readiness reviews earlier this week and

249
00:09:31,030 --> 00:09:28,640
it's a you know it's exciting times as

250
00:09:33,639 --> 00:09:31,040
we're moving forward to this okay well

251
00:09:35,410 --> 00:09:33,649
we're all excited and looking forward to

252
00:09:37,240 --> 00:09:35,420
that so I'm also while we're talking

253
00:09:38,800 --> 00:09:37,250
about the coming of a vehicle let's talk

254
00:09:40,990 --> 00:09:38,810
about the going of a vehicle so we also

255
00:09:43,690 --> 00:09:41,000
have a spacecraft progress 46 p you

256
00:09:47,110 --> 00:09:43,700
mentioned earlier filled up with trash

257
00:09:48,670 --> 00:09:47,120
till it's about to buckle they have

258
00:09:51,220 --> 00:09:48,680
closed the hatches and they are

259
00:09:53,530 --> 00:09:51,230
performing delete checks and that is to

260
00:09:55,750 --> 00:09:53,540
perform the leak checks escape laura and

261
00:09:57,610 --> 00:09:55,760
kononenko and explain a little about

262
00:10:00,160 --> 00:09:57,620
what they are doing those final closeout

263
00:10:02,800 --> 00:10:00,170

activities well it the first of all you

264
00:10:04,630 --> 00:10:02,810
need to pack the thing up and and and

265
00:10:07,420 --> 00:10:04,640
when you're doing that also maintaining

266
00:10:09,970 --> 00:10:07,430
the proper distribution of the of the

267
00:10:12,040 --> 00:10:09,980
stuff in under the mass to or the center

268
00:10:14,530 --> 00:10:12,050
of gravity because it needs to fly as a

269
00:10:16,630 --> 00:10:14,540
free flying vehicle it doesn't land but

270
00:10:19,090 --> 00:10:16,640
it needs to fly safely and so it needs

271
00:10:22,090 --> 00:10:19,100
to be packed so that the control system

272
00:10:24,910 --> 00:10:22,100
knows how to handle it when would bring

273
00:10:26,710 --> 00:10:24,920
the supplies up to space you know

274
00:10:28,980 --> 00:10:26,720
everybody thinks in terms of getting all

275
00:10:31,840 --> 00:10:28,990
of this food up there and and

276
00:10:33,910 --> 00:10:31,850
experiments and clothes and other things

277
00:10:37,090 --> 00:10:33,920
that you use you have to get rid of

278
00:10:40,180 --> 00:10:37,100
those things too and indeed I mean that

279
00:10:42,420 --> 00:10:40,190
our storage our ability to store more

280
00:10:45,280 --> 00:10:42,430
stuff on the space station is limited

281
00:10:47,290 --> 00:10:45,290
because you reach the point it's kind of

282
00:10:50,230 --> 00:10:47,300
like that garage that's over packed and

283
00:10:52,480 --> 00:10:50,240
multi layers deep so you can't find the

284
00:10:54,780 --> 00:10:52,490
thing you're looking for when it's time

285
00:10:57,120 --> 00:10:54,790
to go find that spare part to do or

286
00:10:58,650 --> 00:10:57,130
error or do some work or even find the

287
00:11:00,720 --> 00:10:58,660
food containers that you're supposed to

288
00:11:03,090 --> 00:11:00,730

be opening up next and so we have to get

289
00:11:04,410 --> 00:11:03,100
rid of stuff and the different vehicles

290
00:11:06,810 --> 00:11:04,420
that are going home now like the

291
00:11:09,060 --> 00:11:06,820
progress we say going home of course it

292
00:11:11,250 --> 00:11:09,070
just burns out right but as well as

293
00:11:13,770 --> 00:11:11,260
human waste and and other things they're

294
00:11:15,840 --> 00:11:13,780
all packed in there okay so it's it's

295
00:11:17,160 --> 00:11:15,850
ready to go and it's the crew really

296
00:11:18,780 --> 00:11:17,170
likes packing those things up because

297
00:11:20,700 --> 00:11:18,790
that means you're opening up some free

298
00:11:22,620 --> 00:11:20,710
space i'm born from what come on boy and

299
00:11:24,120 --> 00:11:22,630
so that's the packing part the other

300
00:11:26,250 --> 00:11:24,130
part they're doing right now is making

301
00:11:29,190 --> 00:11:26,260
sure when that vehicle leaves right now

302
00:11:32,550 --> 00:11:29,200
it's attached to a docking port on the

303
00:11:34,950 --> 00:11:32,560
station that has a hatch and and they're

304
00:11:36,770 --> 00:11:34,960
closing the hatch on the cargo ship as

305
00:11:39,870 --> 00:11:36,780
well as the hatch on the station side

306
00:11:42,900 --> 00:11:39,880
because when when the vehicle leaves

307
00:11:44,670 --> 00:11:42,910
that hatch and the seals on that hatch

308
00:11:48,030 --> 00:11:44,680
are now what's keeping the air in the

309
00:11:50,100 --> 00:11:48,040
station and so we do very carefully do

310
00:11:52,770 --> 00:11:50,110
these checks on that interface to make

311
00:11:56,580 --> 00:11:52,780
sure that the hatch on the station side

312
00:11:58,410 --> 00:11:56,590
is is solid and not leaking sure that

313
00:12:00,090 --> 00:11:58,420

all you exposed to space until the next

314
00:12:02,160 --> 00:12:00,100
cargo ship comes to dock in that

315
00:12:03,960 --> 00:12:02,170
location yes so very important work that

316
00:12:05,520 --> 00:12:03,970
they were working on so it sounds like

317
00:12:09,360 --> 00:12:05,530
we just have nothing but important work

318
00:12:11,790 --> 00:12:09,370
up there so let's talk now about there's

319
00:12:13,860 --> 00:12:11,800
also today club and even Asian are

320
00:12:15,570 --> 00:12:13,870
working while Burbank continues to work

321
00:12:18,930 --> 00:12:15,580
on that hydrogen sensor they were going

322
00:12:20,850 --> 00:12:18,940
to be doing some crew departure pipe

323
00:12:22,590 --> 00:12:20,860
work and you talked a little about that

324
00:12:23,880 --> 00:12:22,600
but there let's talk about something you

325
00:12:28,350 --> 00:12:23,890
did not talk about and that was the

326
00:12:29,820 --> 00:12:28,360
center fit check that is the anti G sing

327
00:12:31,590 --> 00:12:29,830
again I think a Venetian is going to be

328
00:12:33,030 --> 00:12:31,600
doing a fit check of that suit today and

329
00:12:35,070 --> 00:12:33,040
talk to me a little about what that is

330
00:12:37,200 --> 00:12:35,080
well in addition to getting your

331
00:12:38,640 --> 00:12:37,210
personal stuff taken care of and part of

332
00:12:41,520 --> 00:12:38,650
it is making sure you're ready to ride

333
00:12:45,510 --> 00:12:41,530
in the Soyuz spaceship again and the the

334
00:12:48,810 --> 00:12:45,520
anti G suit that that we have in the in

335
00:12:50,850 --> 00:12:48,820
them for high performance jet flying and

336
00:12:53,610 --> 00:12:50,860
stuff here we wear what we've just

337
00:12:55,710 --> 00:12:53,620
called the G suit and it's it it's there

338
00:12:58,890 --> 00:12:55,720

there are it's it's kind of like leggins

339
00:13:00,210 --> 00:12:58,900
that that or pants that have air

340
00:13:01,830 --> 00:13:00,220
bladders inside of them and that's

341
00:13:05,220 --> 00:13:01,840
hooked into the jet so when you're

342
00:13:07,710 --> 00:13:05,230
pulling geez that inflates to keep the

343
00:13:09,010 --> 00:13:07,720
blood from pooling in your legs and and

344
00:13:12,340 --> 00:13:09,020
causing you to lose

345
00:13:15,520 --> 00:13:12,350
sciousness we don't use a similar system

346
00:13:18,400 --> 00:13:15,530
we don't use a system with air inflation

347
00:13:20,980 --> 00:13:18,410
for this Russian space suit we use

348
00:13:23,650 --> 00:13:20,990
something that is you actually uses

349
00:13:27,960 --> 00:13:23,660
elastic and they call it the contar and

350
00:13:31,810 --> 00:13:27,970
that you pull it on and it's very tight

351
00:13:35,020 --> 00:13:31,820
and it squeezes particularly the legs

352
00:13:36,730 --> 00:13:35,030
and the leg muscle area is to keep just

353
00:13:40,120 --> 00:13:36,740
to keep those blood vessels from

354
00:13:42,120 --> 00:13:40,130
dilating and after we land and you try

355
00:13:45,520 --> 00:13:42,130
to stand up to climb out of the ship

356
00:13:47,830 --> 00:13:45,530
after your of your body systems right

357
00:13:49,660 --> 00:13:47,840
now is are working to keep the blood

358
00:13:52,420 --> 00:13:49,670
from pooling in the lower parts of our

359
00:13:54,880 --> 00:13:52,430
of our bodies and there's a system of

360
00:13:56,620 --> 00:13:54,890
different check valves in the veins and

361
00:13:59,860 --> 00:13:56,630
the legs and things like that that help

362
00:14:02,770 --> 00:13:59,870
help that as well as just muscle tone in

363
00:14:05,170 --> 00:14:02,780

space those systems get lazy and so you

364
00:14:06,760 --> 00:14:05,180
need to make sure that that you give a

365
00:14:09,580 --> 00:14:06,770
little extra support it's kind of like

366
00:14:11,650 --> 00:14:09,590
support hose actually or something you

367
00:14:14,890 --> 00:14:11,660
might use for for somebody that has

368
00:14:17,620 --> 00:14:14,900
varicose veins to have to help to

369
00:14:20,670 --> 00:14:17,630
squeeze on the extremities the ankles

370
00:14:24,340 --> 00:14:20,680
lower legs to keep those veins from from

371
00:14:26,500 --> 00:14:24,350
expanding so what they're doing today is

372
00:14:29,680 --> 00:14:26,510
a full check of the full system for the

373
00:14:32,890 --> 00:14:29,690
guys putting on that anti-g kind of

374
00:14:34,510 --> 00:14:32,900
elastic g-suit as well as then the

375
00:14:35,740 --> 00:14:34,520
spacesuit and maybe even getting into

376
00:14:38,920 --> 00:14:35,750
the seats and making sure that

377
00:14:42,280 --> 00:14:38,930
everything fits and and that's it's a

378
00:14:44,590 --> 00:14:42,290
it's part of getting kind of ready to

379
00:14:46,840 --> 00:14:44,600
get in change modes because they've been

380
00:14:48,640 --> 00:14:46,850
you know they've been a space station

381
00:14:50,620 --> 00:14:48,650
crew they've been living up there for

382
00:14:52,690 --> 00:14:50,630
five and a half months and they've been

383
00:14:55,600 --> 00:14:52,700
taking care of the space station and

384
00:14:56,800 --> 00:14:55,610
doing science experiments and it's time

385
00:14:58,660 --> 00:14:56,810
to start changing their way of thinking

386
00:15:00,160 --> 00:14:58,670
it's time to start they're going to be

387
00:15:03,390 --> 00:15:00,170
coming home in another spaceship they

388
00:15:05,470 --> 00:15:03,400

have not spent much time in the Soyuz

389
00:15:07,120 --> 00:15:05,480
practicing those procedures that we

390
00:15:09,730 --> 00:15:07,130
spend so much time before launch

391
00:15:11,680 --> 00:15:09,740
practicing and drilling and and being

392
00:15:14,620 --> 00:15:11,690
evaluated and so now it's it's part of

393
00:15:16,330 --> 00:15:14,630
the whole picture every day get doing a

394
00:15:18,880 --> 00:15:16,340
little bit of that kind of work to

395
00:15:22,180 --> 00:15:18,890
prepare for they ride home and what a

396
00:15:24,490 --> 00:15:22,190
ride it oh what a ride it is haha

397
00:15:26,620 --> 00:15:24,500
that is practicing or preparing for

398
00:15:28,900 --> 00:15:26,630
their departure is commander burbank and

399
00:15:32,290 --> 00:15:28,910
anton shkaplerov and anatoly ivanishin

400
00:15:37,000 --> 00:15:32,300
and they are set to depart from the

401
00:15:38,320 --> 00:15:37,010
station on April 27 yes and also thank

402
00:15:41,350 --> 00:15:38,330
you for that correction on their suits

403
00:15:45,130 --> 00:15:41,360
can Tarver I can Tom time i'm working on

404
00:15:46,510 --> 00:15:45,140
my russian not there yet so let's go

405
00:15:49,150 --> 00:15:46,520
ahead and ask some questions we have

406
00:15:50,410 --> 00:15:49,160
asked polled twitter and we got some

407
00:15:51,790 --> 00:15:50,420
questions from the public and we have a

408
00:15:54,700 --> 00:15:51,800
few questions so thank you very much for

409
00:15:57,070 --> 00:15:54,710
sending those to us first we'll ask this

410
00:16:00,600 --> 00:15:57,080
the first question comes from Katie Huth

411
00:16:03,280 --> 00:16:00,610
Jones my question did you see something

412
00:16:05,260 --> 00:16:03,290
spectacular from the cupola that you are

413
00:16:06,790 --> 00:16:05,270

unable to capture with your camera first

414
00:16:08,050 --> 00:16:06,800
let's talk about what the cupola is and

415
00:16:09,550 --> 00:16:08,060
then we can answer that question well

416
00:16:11,320 --> 00:16:09,560
first I want to say hi to katie she's a

417
00:16:13,630 --> 00:16:11,330
very old friend and yours was the first

418
00:16:15,790 --> 00:16:13,640
question that popped up so this this

419
00:16:17,890 --> 00:16:15,800
will be fun and I'm glad to answer your

420
00:16:19,990 --> 00:16:17,900
question the cupola is the little

421
00:16:22,960 --> 00:16:20,000
cluster of windows sits on the bottom of

422
00:16:25,660 --> 00:16:22,970
the station and it is spectacular it is

423
00:16:27,550 --> 00:16:25,670
such an amazing part of the station the

424
00:16:30,550 --> 00:16:27,560
other windows that we have are pretty

425
00:16:33,850 --> 00:16:30,560
much you know flush with the with the

426
00:16:35,710 --> 00:16:33,860
outer walls and most of them point down

427
00:16:38,380 --> 00:16:35,720
toward the earth which is really cool

428
00:16:41,440 --> 00:16:38,390
but you don't get a good chance to see

429
00:16:43,210 --> 00:16:41,450
the horizon and with this little cluster

430
00:16:44,950 --> 00:16:43,220
of windows there's one large one that

431
00:16:46,900 --> 00:16:44,960
looks down but there's six that look

432
00:16:51,100 --> 00:16:46,910
around the sides too so you can see the

433
00:16:53,170 --> 00:16:51,110
horizon and for me now I love to try to

434
00:16:55,210 --> 00:16:53,180
capture these these views in the low

435
00:16:57,490 --> 00:16:55,220
light photography of the Aurora and city

436
00:16:59,770 --> 00:16:57,500
lights and stuff were a real challenge

437
00:17:01,990 --> 00:16:59,780
and I enjoy doing that something that I

438
00:17:04,990 --> 00:17:02,000

kept trying to get and I could never get

439
00:17:07,540 --> 00:17:05,000
it right was to really try to capture

440
00:17:10,090 --> 00:17:07,550
the sunrise because it was just so cool

441
00:17:12,179 --> 00:17:10,100
as you're coming across it at night and

442
00:17:15,329 --> 00:17:12,189
seeing the city's rolling by down below

443
00:17:18,280 --> 00:17:15,339
occasionally shooting stars down below

444
00:17:19,840 --> 00:17:18,290
and and then to see the light as it

445
00:17:22,630 --> 00:17:19,850
starts to grow in the horizon as you're

446
00:17:25,449 --> 00:17:22,640
coming toward the sunrise and and and

447
00:17:27,640 --> 00:17:25,459
that light spreads you know across your

448
00:17:29,350 --> 00:17:27,650
view across the horizon and you get the

449
00:17:31,540 --> 00:17:29,360
layers of the atmosphere is the lights

450
00:17:33,160 --> 00:17:31,550
kind of bending through and you can see

451
00:17:34,010 --> 00:17:33,170
these layers and the colors that grow

452
00:17:36,050 --> 00:17:34,020
and grow

453
00:17:38,570 --> 00:17:36,060
and you know it's just a really cool

454
00:17:41,090 --> 00:17:38,580
thing and I couldn't capture that with

455
00:17:42,590 --> 00:17:41,100
the cameras because the extreme lighting

456
00:17:44,870 --> 00:17:42,600
was just too much for it and so I

457
00:17:46,970 --> 00:17:44,880
couldn't get that the really good bands

458
00:17:50,120 --> 00:17:46,980
of color in the atmosphere as well as

459
00:17:52,310 --> 00:17:50,130
kind of the Purple's of the earth and

460
00:17:53,930 --> 00:17:52,320
the as it's starting to be illuminated

461
00:17:57,200 --> 00:17:53,940
down below it sounds like a very

462
00:17:58,880 --> 00:17:57,210
brilliant scene to see and despite the

463
00:18:02,060 --> 00:17:58,890

fact that how many sunrises do you come

464
00:18:04,070 --> 00:18:02,070
across 16 a day and how many you have a

465
00:18:06,740 --> 00:18:04,080
lot of seven days Iran's you have a lot

466
00:18:09,980 --> 00:18:06,750
of opportunities but just hard to catch

467
00:18:12,890 --> 00:18:09,990
hard to capture that kind of thing it

468
00:18:16,460 --> 00:18:12,900
can be done though and and if the guys

469
00:18:18,380 --> 00:18:16,470
up there Dan and Dan Burbank and Don

470
00:18:20,780 --> 00:18:18,390
Pettit and Andre to have been working

471
00:18:22,070 --> 00:18:20,790
hard at catching some of those things so

472
00:18:23,600 --> 00:18:22,080
there's there's some really nice shots

473
00:18:27,200 --> 00:18:23,610
up there okay sounds like you need to

474
00:18:29,270 --> 00:18:27,210
know the trip oh maybe so okay well

475
00:18:32,300 --> 00:18:29,280
speaking of the buoyancy of some of the

476
00:18:35,330 --> 00:18:32,310
sites awarded ISS the second question on

477
00:18:37,340 --> 00:18:35,340
Twitter comes to us from seb and do you

478
00:18:40,480 --> 00:18:37,350
see the city lights as bright as they're

479
00:18:43,460 --> 00:18:40,490
shown on the ISS night timelapse videos

480
00:18:45,380 --> 00:18:43,470
you do the city lights really show up

481
00:18:46,900 --> 00:18:45,390
like that I love to actually had two

482
00:18:48,770 --> 00:18:46,910
pairs of binoculars in the cupola

483
00:18:52,070 --> 00:18:48,780
because you could see the city lights

484
00:18:53,780 --> 00:18:52,080
and it was really cool and I discovered

485
00:18:56,720 --> 00:18:53,790
just with binoculars with a little bit

486
00:18:58,610 --> 00:18:56,730
of a magnification like that you can see

487
00:19:00,200 --> 00:18:58,620
so many details that really jump out

488
00:19:02,720 --> 00:19:00,210

because you have the darker countryside

489
00:19:04,880 --> 00:19:02,730
and then you see these these lights and

490
00:19:07,970 --> 00:19:04,890
you can you know literally see

491
00:19:09,410 --> 00:19:07,980
individual cars on roads out there as

492
00:19:11,600 --> 00:19:09,420
you realize what you're looking at is

493
00:19:16,820 --> 00:19:11,610
the little Bhima headlights or streams

494
00:19:18,650 --> 00:19:16,830
of cars and it so cities and and to see

495
00:19:20,000 --> 00:19:18,660
the bridges to see the rivers that come

496
00:19:22,190 --> 00:19:20,010
through the city with the bridges across

497
00:19:24,770 --> 00:19:22,200
them all those things really jump out

498
00:19:26,120 --> 00:19:24,780
and just amazing to see well that was a

499
00:19:28,430 --> 00:19:26,130
great question because I know that you

500
00:19:29,990 --> 00:19:28,440
sent us a lot of those videos we so we

501
00:19:31,850 --> 00:19:30,000
had a lot of those time-lapse videos and

502
00:19:35,570 --> 00:19:31,860
to me personally it looks sort of like

503
00:19:37,250 --> 00:19:35,580
glitter you know I love ya because you

504
00:19:40,160 --> 00:19:37,260
look at these things and you say how can

505
00:19:42,260 --> 00:19:40,170
I how could I describe this I'm an

506
00:19:44,840 --> 00:19:42,270
engineer yeah I don't have the words to

507
00:19:47,150 --> 00:19:44,850
describe what this looks like and

508
00:19:49,760 --> 00:19:47,160
have to now you can see it you can see

509
00:19:52,190 --> 00:19:49,770
it as we see it and it's sped up when we

510
00:19:54,800 --> 00:19:52,200
take those individual photos and string

511
00:19:57,770 --> 00:19:54,810
them together to make make you know a

512
00:19:59,510 --> 00:19:57,780
video it's we're moving faster in the

513
00:20:01,760 --> 00:19:59,520

video then we're really moving but you

514
00:20:04,430 --> 00:20:01,770
can see it and get that same feeling we

515
00:20:06,170 --> 00:20:04,440
have sure and so thank you to the public

516
00:20:11,510 --> 00:20:06,180
for those questions we have one final

517
00:20:14,240 --> 00:20:11,520
questions here I'm curious as well okay

518
00:20:16,370 --> 00:20:14,250
so this comes from auto Chen hi Mike one

519
00:20:20,320 --> 00:20:16,380
question that concerns me how does it

520
00:20:25,520 --> 00:20:20,330
smell in the ISS thank you for answering

521
00:20:27,770 --> 00:20:25,530
it is a unique smell and it you don't

522
00:20:29,780 --> 00:20:27,780
notice it after you've been there but

523
00:20:33,530 --> 00:20:29,790
when you first get there you definitely

524
00:20:36,740 --> 00:20:33,540
notice it and interestingly I I was able

525
00:20:39,260 --> 00:20:36,750
to bring home a shirt was able to bring

526
00:20:41,300 --> 00:20:39,270
home in my allotment of personal things

527
00:20:46,520 --> 00:20:41,310
I could bring back it came back in a in

528
00:20:48,770 --> 00:20:46,530
a plastic wrap and and and when I opened

529
00:20:51,260 --> 00:20:48,780
that back up it had nobody else had

530
00:20:53,240 --> 00:20:51,270
opened it and there's the smell of space

531
00:20:56,360 --> 00:20:53,250
station to me it smells like a

532
00:21:01,670 --> 00:20:56,370
combination of kind of exotic foods and

533
00:21:03,560 --> 00:21:01,680
spices in a locker room interesting in a

534
00:21:05,330 --> 00:21:03,570
good description well here you know

535
00:21:07,670 --> 00:21:05,340
you're living and working up there for a

536
00:21:09,350 --> 00:21:07,680
period of time and so that's uh I can

537
00:21:11,000 --> 00:21:09,360
imagine so there's also a jam aboard

538
00:21:12,770 --> 00:21:11,010

there is a triple board what you're

539
00:21:16,910 --> 00:21:12,780
using almost every day that's exactly

540
00:21:18,680 --> 00:21:16,920
right yay so so let's get back to space

541
00:21:20,870 --> 00:21:18,690
station I think we let's see if we can

542
00:21:23,210 --> 00:21:20,880
get some video that's that's coming down

543
00:21:25,550 --> 00:21:23,220
to us now the other one of the other

544
00:21:28,610 --> 00:21:25,560
activities that is taking place right

545
00:21:30,260 --> 00:21:28,620
now is Don Pettit is working with

546
00:21:33,050 --> 00:21:30,270
Robonaut and you spent some time with

547
00:21:35,450 --> 00:21:33,060
over not oh you bet so he spent some

548
00:21:36,920 --> 00:21:35,460
time assembling and putting Roca not

549
00:21:39,170 --> 00:21:36,930
together and we're getting a lot live

550
00:21:40,970 --> 00:21:39,180
you right now that is a bore this space

551
00:21:43,160 --> 00:21:40,980
station yeah today is that like a hand

552
00:21:44,720 --> 00:21:43,170
dexterity exercise is a part of what's

553
00:21:47,780 --> 00:21:44,730
going on Robonaut it's a really cool

554
00:21:50,090 --> 00:21:47,790
experiment the first humanoid robot you

555
00:21:52,070 --> 00:21:50,100
know in space and so it's it's really

556
00:21:55,100 --> 00:21:52,080
fascinating now I will tell you he has

557
00:21:57,710 --> 00:21:55,110
freaky long arms

558
00:21:59,900 --> 00:21:57,720
when he stretches out like that to see

559
00:22:02,299 --> 00:21:59,910
his arm then we cut you know he's a

560
00:22:04,460 --> 00:22:02,309
wingspan his arms are I'm guessing

561
00:22:06,620 --> 00:22:04,470
twenty percent longer than you know the

562
00:22:09,169 --> 00:22:06,630
normal if for you know for you know

563
00:22:11,930 --> 00:22:09,179

humanoid torso and head that size these

564
00:22:14,299 --> 00:22:11,940
arms are really long and the fingers are

565
00:22:16,580 --> 00:22:14,309
extra long too but it's it's really

566
00:22:20,960 --> 00:22:16,590
fascinating to see you know and actually

567
00:22:23,090 --> 00:22:20,970
the kind of coordination that does exist

568
00:22:25,039 --> 00:22:23,100
in there and there there's four sensors

569
00:22:27,680 --> 00:22:25,049
built into his hand which allows him to

570
00:22:30,409 --> 00:22:27,690
actually reach out and take your hand

571
00:22:32,270 --> 00:22:30,419
and shake it without crushing it because

572
00:22:34,130 --> 00:22:32,280
he has a strength the question shake I

573
00:22:36,770 --> 00:22:34,140
would you bet it is and so are you ever

574
00:22:39,620 --> 00:22:36,780
intimidated by the handshake is you did

575
00:22:41,419 --> 00:22:39,630
do it I didn't get the handshake it

576
00:22:43,310 --> 00:22:41,429
didn't oh no that's why it was it was

577
00:22:44,780 --> 00:22:43,320
cut short it was cut short a little bit

578
00:22:46,310 --> 00:22:44,790
they were still I mean that we're

579
00:22:48,919 --> 00:22:46,320
learning and that's the why we're sent

580
00:22:51,590 --> 00:22:48,929
him that the only time I was surprised

581
00:22:53,330 --> 00:22:51,600
was there was a some motion that was a

582
00:22:55,490 --> 00:22:53,340
it was bigger motion than I was

583
00:22:57,530 --> 00:22:55,500
expecting and I hadn't cleared enough

584
00:23:01,880 --> 00:22:57,540
room for this big guy to start sweeping

585
00:23:03,320 --> 00:23:01,890
his arms around so I and fortunately it

586
00:23:06,560 --> 00:23:03,330
just it startled me a little bit

587
00:23:09,080 --> 00:23:06,570
everything was fine but before before we

588
00:23:10,220 --> 00:23:09,090

let him out to to play anymore we we

589
00:23:12,049 --> 00:23:10,230
made sure we cleaned up all the

590
00:23:13,850 --> 00:23:12,059
computers and cables and things that

591
00:23:16,220 --> 00:23:13,860
might be within his field to reach right

592
00:23:20,270 --> 00:23:16,230
well aside from fun Robonaut I know has

593
00:23:22,159 --> 00:23:20,280
some very important task and and he it

594
00:23:23,690 --> 00:23:22,169
is up there for a specific reason you

595
00:23:27,020 --> 00:23:23,700
want to talk to you well you know right

596
00:23:29,060 --> 00:23:27,030
now we're there we have found their

597
00:23:32,030 --> 00:23:29,070
there are a lot of things to learn about

598
00:23:34,130 --> 00:23:32,040
how the robot actually moves and works

599
00:23:37,310 --> 00:23:34,140
in the zero-g environment we have

600
00:23:39,860 --> 00:23:37,320
actually was kind of unexpected because

601
00:23:41,409 --> 00:23:39,870
as the initial build up as we're

602
00:23:44,060 --> 00:23:41,419
learning how to do these kind of things

603
00:23:47,900 --> 00:23:44,070
he was you know the plan was for him to

604
00:23:50,360 --> 00:23:47,910
do you know pre-planned kinds of

605
00:23:53,210 --> 00:23:50,370
activities and stuff that had been done

606
00:23:56,200 --> 00:23:53,220
on the ground but we find that the

607
00:23:59,299 --> 00:23:56,210
dynamics of the motion in zero gravity

608
00:24:01,789 --> 00:23:59,309
the joints and stuff don't have the same

609
00:24:03,620 --> 00:24:01,799
kind of resistance or drag and so

610
00:24:05,570 --> 00:24:03,630
there's a like I think of it as like a

611
00:24:07,880 --> 00:24:05,580
bouncing when he goes to move his arm

612
00:24:08,730 --> 00:24:07,890
there would be a little bit of a bounce

613
00:24:11,160 --> 00:24:08,740

to it because

614
00:24:14,220 --> 00:24:11,170
he wasn't you know kind of dampening out

615
00:24:18,570 --> 00:24:14,230
or holding the arm down and that caused

616
00:24:20,520 --> 00:24:18,580
it caused it to trip and so we had to we

617
00:24:23,430 --> 00:24:20,530
learned about the dynamics of the motion

618
00:24:25,260 --> 00:24:23,440
and controlling that motion and so

619
00:24:27,299 --> 00:24:25,270
they've been reprogramming and tweaking

620
00:24:29,010 --> 00:24:27,309
and refining you know those models that

621
00:24:30,630 --> 00:24:29,020
make him work a little bit better and so

622
00:24:33,360 --> 00:24:30,640
it's been a learning process it's been

623
00:24:36,150 --> 00:24:33,370
wonderful the things you cannot learn on

624
00:24:37,950 --> 00:24:36,160
the ground that they kind of expected

625
00:24:39,870 --> 00:24:37,960
these things to go you know go ripping

626
00:24:41,580 --> 00:24:39,880
right through those kind of checks and

627
00:24:44,160 --> 00:24:41,590
you know and on to bigger and better

628
00:24:46,560 --> 00:24:44,170
things but hey that's why you do this

629
00:24:48,150 --> 00:24:46,570
kind of testing and so you know and it's

630
00:24:49,380 --> 00:24:48,160
it's a build-up approach to go through

631
00:24:51,720 --> 00:24:49,390
those kind of things to learn the

632
00:24:56,280 --> 00:24:51,730
control and then to work our way into

633
00:24:58,680 --> 00:24:56,290
doing things like a few weeks ago I did

634
00:25:03,330 --> 00:24:58,690
the first what you would call useful

635
00:25:07,350 --> 00:25:03,340
work where he's moving a a velocity

636
00:25:09,150 --> 00:25:07,360
detector in front of an air air vent and

637
00:25:12,990 --> 00:25:09,160
that's something we do the crew does

638
00:25:15,690 --> 00:25:13,000

periodically and it's to measure when

639
00:25:18,120 --> 00:25:15,700
you get it build up a dust in the

640
00:25:21,840 --> 00:25:18,130
ventilation system it starts to actually

641
00:25:24,090 --> 00:25:21,850
degrade the ventilation and so you have

642
00:25:27,240 --> 00:25:24,100
you monitor the air flow out of these

643
00:25:29,070 --> 00:25:27,250
vents and at a certain point you know

644
00:25:32,160 --> 00:25:29,080
it's time to go in and clean things up

645
00:25:35,750 --> 00:25:32,170
again it's tedious it's hard to do it

646
00:25:38,190 --> 00:25:35,760
repeatedly in exactly the same place

647
00:25:39,990 --> 00:25:38,200
well robots are good at that kind of

648
00:25:42,240 --> 00:25:40,000
thing they can get it back in the same

649
00:25:44,220 --> 00:25:42,250
place that he did it last time he could

650
00:25:47,130 --> 00:25:44,230
do it every time so you get a better

651
00:25:49,140 --> 00:25:47,140
measure sure of that and so your bill to

652
00:25:50,730 --> 00:25:49,150
do better trend tracking and it also

653
00:25:52,200 --> 00:25:50,740
doesn't take fruit on and it doesn't

654
00:25:53,820 --> 00:25:52,210
take crew time and that's the eventual

655
00:25:56,370 --> 00:25:53,830
goal is to have things like this that

656
00:25:59,040 --> 00:25:56,380
can help us out great well thank you

657
00:26:01,290 --> 00:25:59,050
guys so much for that so we have just a

658
00:26:04,200 --> 00:26:01,300
little bit of time well let's talk real

659
00:26:06,210 --> 00:26:04,210
quickly about earlier this morning pet I

660
00:26:08,280 --> 00:26:06,220
mean I'm sorry commander Burbank had

661
00:26:09,419 --> 00:26:08,290
actually done some quality water testing

662
00:26:11,910 --> 00:26:09,429
and the reason why I want to bring this

663
00:26:14,490 --> 00:26:11,920

up is that Earth Day is right around the

664
00:26:17,280 --> 00:26:14,500
corner it's on sunday april the 22nd and

665
00:26:19,080 --> 00:26:17,290
so i wanted to talk a little about you

666
00:26:21,170 --> 00:26:19,090
know the water quality testing but also

667
00:26:22,850 --> 00:26:21,180
more importantly the water reclamation

668
00:26:26,390 --> 00:26:22,860
you can just talked a little about that

669
00:26:28,460 --> 00:26:26,400
well the because of the logistics or the

670
00:26:30,860 --> 00:26:28,470
difficulty of launching water to space

671
00:26:32,300 --> 00:26:30,870
because it weighs you know one kilogram

672
00:26:34,160 --> 00:26:32,310
per liter no matter what you do you

673
00:26:36,470 --> 00:26:34,170
can't freeze dry it or anything else and

674
00:26:38,420 --> 00:26:36,480
so we've got to reuse as much water as

675
00:26:41,180 --> 00:26:38,430
possible on the station and that means

676
00:26:42,530 --> 00:26:41,190
reclaiming the condensation out of the

677
00:26:45,050 --> 00:26:42,540
air conditioning system that's

678
00:26:48,080 --> 00:26:45,060
reclaiming the water that we we exhale

679
00:26:49,910 --> 00:26:48,090
we breathe out or we sweat out when we

680
00:26:51,560 --> 00:26:49,920
have those sweaty gym clothes we let

681
00:26:53,660 --> 00:26:51,570
them dry out then we collect the water

682
00:26:56,600 --> 00:26:53,670
back in the through the air conditioning

683
00:27:00,830 --> 00:26:56,610
system put it into the purifier we also

684
00:27:02,840 --> 00:27:00,840
collect we reclaim part of the water out

685
00:27:05,120 --> 00:27:02,850
of the urine that we collect it goes

686
00:27:07,640 --> 00:27:05,130
into a system that helps evaporate out

687
00:27:10,280 --> 00:27:07,650
part of that water we don't get all of

688
00:27:11,900 --> 00:27:10,290

it but we get a about half of it and

689
00:27:13,610 --> 00:27:11,910
then that has to go through a whole

690
00:27:15,830 --> 00:27:13,620
purification system so you're getting

691
00:27:17,510 --> 00:27:15,840
condensation that's dripping out a lot

692
00:27:20,270 --> 00:27:17,520
of air flow picking up things from the

693
00:27:23,450 --> 00:27:20,280
atmosphere obviously the you know that

694
00:27:25,910 --> 00:27:23,460
the contaminants associated with with

695
00:27:29,300 --> 00:27:25,920
cleaning you know urine back into

696
00:27:31,370 --> 00:27:29,310
drinking water are very clear and and so

697
00:27:33,650 --> 00:27:31,380
we monitor this kind of stuff and the

698
00:27:36,470 --> 00:27:33,660
systems that we have to do that that

699
00:27:39,680 --> 00:27:36,480
they've come up with are actually being

700
00:27:42,410 --> 00:27:39,690
used now in disaster situations where

701
00:27:44,840 --> 00:27:42,420
you can take water but not as maybe not

702
00:27:47,000 --> 00:27:44,850
as dirty as exit pouring urine in one

703
00:27:48,800 --> 00:27:47,010
end but taking stream water or other

704
00:27:51,680 --> 00:27:48,810
water sources that are that are known

705
00:27:53,000 --> 00:27:51,690
not to be safe or suspect and putting

706
00:27:54,770 --> 00:27:53,010
them through the same kind of filter

707
00:27:56,210 --> 00:27:54,780
systems we're using on the space station

708
00:27:58,250 --> 00:27:56,220
that we've developed for the space

709
00:28:00,620 --> 00:27:58,260
station and and that's that's

710
00:28:03,140 --> 00:28:00,630
immediately providing water in disaster

711
00:28:05,000 --> 00:28:03,150
situations which is a you know a great

712
00:28:06,920 --> 00:28:05,010
way to bring some of that technology

713
00:28:08,720 --> 00:28:06,930

back to earth that's fascinating you

714
00:28:12,050 --> 00:28:08,730
know you know they say ingenuity is the

715
00:28:14,000 --> 00:28:12,060
mother of all invention so I'm necessity

716
00:28:16,250 --> 00:28:14,010
I'm sorry is the mother of invention so

717
00:28:18,260 --> 00:28:16,260
and it's interesting that we we do have

718
00:28:19,370 --> 00:28:18,270
some takeaways you know on some of the

719
00:28:21,620 --> 00:28:19,380
knowledge that will transform things

720
00:28:23,690 --> 00:28:21,630
from space station here back on earth

721
00:28:25,730 --> 00:28:23,700
you bet and so I think we're running

722
00:28:28,310 --> 00:28:25,740
just a little bit and close to you

723
00:28:32,030 --> 00:28:28,320
quittin time and so first I just want to

724
00:28:34,280 --> 00:28:32,040
mention that the progress and docking is

725
00:28:36,410 --> 00:28:34,290
again scheduled to take place at

726
00:28:38,630 --> 00:28:36,420
604 a.m. central time we'll have that

727
00:28:41,390 --> 00:28:38,640
televised here live on NASA television

728
00:28:44,210 --> 00:28:41,400
and that coverage will begin at 5 45

729
00:28:46,130 --> 00:28:44,220
a.m. again thanks so much for coming out

730
00:28:48,230 --> 00:28:46,140
and talking with us today it's always a

731
00:28:49,730 --> 00:28:48,240
pleasure it's great being here amico I