1
00:00:05,430 --> 00:00:03,510
one of the busiest flight controllers in

2
00:00:07,190 --> 00:00:05,440
mission control is with us today on an

3
00:00:09,110 --> 00:00:07,200
extremely busy day

4
00:00:10,629 --> 00:00:09,120
visiting vehicle officer tom arkenswick

5
00:00:12,950 --> 00:00:10,639
joining us in between this morning's

6
00:00:14,870 --> 00:00:12,960
launch of the iss progress resupply ship

7
00:00:17,269 --> 00:00:14,880
and its upcoming docking

8
00:00:19,029 --> 00:00:17,279
tom thanks for joining us today as with

9
00:00:20,550 --> 00:00:19,039
any international partner vehicle

10
00:00:22,550 --> 00:00:20,560
arriving at the international space

11
00:00:24,950 --> 00:00:22,560
station there's a lot of coordination

12
00:00:26,950 --> 00:00:24,960
involved tell us if you would what your

13
00:00:28,710 --> 00:00:26,960

team does and what type of coordination

14
00:00:29,669 --> 00:00:28,720
is involved in advance of the launch and

15
00:00:31,109 --> 00:00:29,679
docking

16
00:00:32,950 --> 00:00:31,119
sure there are a number of things that

17
00:00:35,430 --> 00:00:32,960
we do in advance of the launch and

18
00:00:37,910 --> 00:00:35,440
docking um going all the way out

19
00:00:40,709 --> 00:00:37,920
you know a year or so in advance we work

20
00:00:43,110 --> 00:00:40,719
with the russians on how their vehicles

21
00:00:45,590 --> 00:00:43,120
can come to the station safely in terms

22
00:00:47,910 --> 00:00:45,600
of their rendezvous radar system and

23
00:00:50,150 --> 00:00:47,920
their trajectories and so as much as a

24
00:00:52,069 --> 00:00:50,160
year and then into six months away we

25
00:00:53,750 --> 00:00:52,079
are looking with them at their

26
00:00:55,110 --> 00:00:53,760
preliminary trajectories to make sure

27
00:00:56,310 --> 00:00:55,120
they'll be safe

28
00:00:58,069 --> 00:00:56,320
and to make sure that there will be no

29
00:00:59,990 --> 00:00:58,079
interference for the radar system from

30
00:01:01,349 --> 00:01:00,000
any of the u.s systems or any of the u.s

31
00:01:03,590 --> 00:01:01,359
solar arrays

32
00:01:04,950 --> 00:01:03,600
as we get in closer to the flight for

33
00:01:07,109 --> 00:01:04,960
example about a month out and then a

34
00:01:08,789 --> 00:01:07,119
week out we're working jointly not only

35
00:01:11,990 --> 00:01:08,799
with the russians but all of the u.s

36
00:01:14,310 --> 00:01:12,000
teams to coordinate the planning of the

37
00:01:16,390 --> 00:01:14,320
us segment

38
00:01:19,350 --> 00:01:16,400

preparation for the docking in terms of

39
00:01:21,030 --> 00:01:19,360
array positions radiator positions again

40
00:01:23,350 --> 00:01:21,040
making sure that it won't be any issue

41
00:01:26,230 --> 00:01:23,360
for their radar system

42
00:01:27,510 --> 00:01:26,240
and also providing an overview of what

43
00:01:30,630 --> 00:01:27,520
that rendezvous and docking will look

44
00:01:32,710 --> 00:01:30,640
like to the us segment folks so they

45
00:01:34,550 --> 00:01:32,720
understand the timeline of events from

46
00:01:36,550 --> 00:01:34,560
launch all the way to docking whether it

47
00:01:38,710 --> 00:01:36,560
be a one day docking like we'll be doing

48
00:01:40,789 --> 00:01:38,720
with this one or the more traditional

49
00:01:42,789 --> 00:01:40,799
you know two to three day docking

50
00:01:44,230 --> 00:01:42,799
and that gives everybody an overview of

51
00:01:46,310 --> 00:01:44,240
what will be happening on the russian

52
00:01:47,990 --> 00:01:46,320
side so that we all understand it in

53
00:01:50,149 --> 00:01:48,000
advance and aren't having to ask a lot

54
00:01:51,990 --> 00:01:50,159
of questions in real time

55
00:01:53,590 --> 00:01:52,000
this docking is going to follow two

56
00:01:55,590 --> 00:01:53,600
previous progress launches with a

57
00:01:56,389 --> 00:01:55,600
profile to launch and dock in the same

58
00:01:58,469 --> 00:01:56,399
day

59
00:02:00,389 --> 00:01:58,479
historically progress ships have taken

60
00:02:01,830 --> 00:02:00,399
two days and some cases three days to

61
00:02:03,670 --> 00:02:01,840
reach the station

62
00:02:05,429 --> 00:02:03,680
what challenges are involved in planning

63
00:02:06,870 --> 00:02:05,439

for this accelerated rendezvous yeah i

64
00:02:09,910 --> 00:02:06,880
would say there are challenges both for

65
00:02:11,589 --> 00:02:09,920
the moscow team and the houston team

66
00:02:13,430 --> 00:02:11,599
and certainly

67
00:02:15,510 --> 00:02:13,440
when we do this with soyuz it'll be

68
00:02:17,990 --> 00:02:15,520
challenging for the crew as well

69
00:02:20,229 --> 00:02:18,000
but focusing on the ground teams

70
00:02:21,830 --> 00:02:20,239
it involves a lot more commanding and a

71
00:02:23,750 --> 00:02:21,840
lot more coordination just within the

72
00:02:25,510 --> 00:02:23,760
moscow side because they have to take

73
00:02:27,750 --> 00:02:25,520
what used to be two days worth of

74
00:02:31,110 --> 00:02:27,760
activities and squeeze them all into

75
00:02:33,830 --> 00:02:31,120
into one day so you're doing a number of

76
00:02:35,830 --> 00:02:33,840
rendezvous maneuvers and burns within a

77
00:02:38,390 --> 00:02:35,840
couple of orbits that traditionally was

78
00:02:40,390 --> 00:02:38,400
done over two days and that's to get you

79
00:02:41,910 --> 00:02:40,400
up from the insertion altitude that the

80
00:02:43,589 --> 00:02:41,920
booster

81
00:02:45,670 --> 00:02:43,599
drops the vehicle off and get them all

82
00:02:47,990 --> 00:02:45,680
the way up to space station

83
00:02:49,430 --> 00:02:48,000
and uh also

84
00:02:51,509 --> 00:02:49,440
basically checking out all of the

85
00:02:53,350 --> 00:02:51,519
vehicle systems making sure they're all

86
00:02:54,630 --> 00:02:53,360
working so that you know it's safe to

87
00:02:56,550 --> 00:02:54,640
bring the vehicle to the station

88
00:02:58,149 --> 00:02:56,560

vicinity all of those things have to

89
00:03:00,070 --> 00:02:58,159
happen basically in the first two to

90
00:03:01,830 --> 00:03:00,080
three orbits whereas with a two-day

91
00:03:03,110 --> 00:03:01,840
rendezvous you can do some of that on

92
00:03:04,710 --> 00:03:03,120
the first day and you can do some of

93
00:03:07,030 --> 00:03:04,720
that on the second day you know it's

94
00:03:08,630 --> 00:03:07,040
plenty of time and multiple russian

95
00:03:10,309 --> 00:03:08,640
ground station passes to get all that

96
00:03:11,830 --> 00:03:10,319
done so you're compressing all of that

97
00:03:14,949 --> 00:03:11,840
into a single day

98
00:03:16,949 --> 00:03:14,959
as 48p and 49p showed

99
00:03:18,309 --> 00:03:16,959
it's obviously safe and quite possible

100
00:03:19,750 --> 00:03:18,319
to make all that happen but it's

101
00:03:21,589 --> 00:03:19,760
certainly more challenging to do that in

102
00:03:23,750 --> 00:03:21,599
that compressed time frame

103
00:03:26,229 --> 00:03:23,760
on the us side i would say it's not

104
00:03:28,070 --> 00:03:26,239
quite as much more challenging because

105
00:03:30,470 --> 00:03:28,080
primarily all we're doing is configuring

106
00:03:32,229 --> 00:03:30,480
the us segment for the docking part and

107
00:03:34,309 --> 00:03:32,239
really aren't involved in the launch

108
00:03:35,589 --> 00:03:34,319
part other than the vvo job of

109
00:03:37,509 --> 00:03:35,599
monitoring what's going on with the

110
00:03:39,350 --> 00:03:37,519
russian vehicle so that we can provide

111
00:03:40,309 --> 00:03:39,360
that insight to the u.s team in real

112
00:03:41,430 --> 00:03:40,319
time

113
00:03:42,949 --> 00:03:41,440

so

114
00:03:44,390 --> 00:03:42,959
from that perspective it's it's pretty

115
00:03:46,390 --> 00:03:44,400
much the same

116
00:03:48,630 --> 00:03:46,400
tom this progress is bringing up almost

117
00:03:50,949 --> 00:03:48,640
three tons of food fuel and supplies for

118
00:03:52,550 --> 00:03:50,959
the six crew members on the station does

119
00:03:54,550 --> 00:03:52,560
your team deal at all with the actual

120
00:03:56,309 --> 00:03:54,560
cargo or are you and your colleagues

121
00:03:58,470 --> 00:03:56,319
strictly focused on the flight dynamics

122
00:04:00,470 --> 00:03:58,480
and docking coordination only yeah we're

123
00:04:03,110 --> 00:04:00,480
strictly involved in the the rendezvous

124
00:04:04,550 --> 00:04:03,120
dynamics and coordination that part so

125
00:04:06,470 --> 00:04:04,560
we work with a couple of different

126
00:04:08,390 --> 00:04:06,480
groups on the russian side to make that

127
00:04:09,990 --> 00:04:08,400
happen there are the the rendezvous

128
00:04:13,110 --> 00:04:10,000
specialists themselves who are

129
00:04:14,949 --> 00:04:13,120
responsible not only for the theoretical

130
00:04:17,590 --> 00:04:14,959
design of the trajectories and to make

131
00:04:19,670 --> 00:04:17,600
sure that they are safe but also for

132
00:04:21,189 --> 00:04:19,680
both the hardware and software for the

133
00:04:23,909 --> 00:04:21,199
guidance and navigation and control

134
00:04:26,230 --> 00:04:23,919
system that makes all of that happen

135
00:04:27,270 --> 00:04:26,240
so we are involved in discussions with

136
00:04:29,350 --> 00:04:27,280
them

137
00:04:31,110 --> 00:04:29,360
not only for the flight specific part in

138
00:04:33,749 --> 00:04:31,120

terms of how the vehicle is going to

139
00:04:34,790 --> 00:04:33,759
implement all that on a given docking

140
00:04:35,990 --> 00:04:34,800
but also

141
00:04:37,270 --> 00:04:36,000
the

142
00:04:39,830 --> 00:04:37,280
regular

143
00:04:40,710 --> 00:04:39,840
evolution of those systems like anybody

144
00:04:42,550 --> 00:04:40,720
else

145
00:04:44,870 --> 00:04:42,560
they are you know constantly trying to

146
00:04:46,870 --> 00:04:44,880
upgrade and improve their systems

147
00:04:48,790 --> 00:04:46,880
anytime they make a significant change

148
00:04:50,230 --> 00:04:48,800
we obviously have to assess that in

149
00:04:52,150 --> 00:04:50,240
order to understand if there are

150
00:04:53,590 --> 00:04:52,160
implications to how they're rendezvouing

151
00:04:55,830 --> 00:04:53,600
with the station and to make sure that's

152
00:04:58,230 --> 00:04:55,840
safe and so that is part of our overall

153
00:04:59,590 --> 00:04:58,240
process then we're also involved with a

154
00:05:00,310 --> 00:04:59,600
another group at

155
00:05:01,909 --> 00:05:00,320
the

156
00:05:04,469 --> 00:05:01,919
mcc moscow

157
00:05:06,469 --> 00:05:04,479
who provides that interface in real time

158
00:05:07,430 --> 00:05:06,479
uh so that if anything off nominal

159
00:05:09,029 --> 00:05:07,440
happens

160
00:05:10,710 --> 00:05:09,039
or even just nominal but maybe a

161
00:05:12,150 --> 00:05:10,720
dispersion we can talk about that in

162
00:05:13,670 --> 00:05:12,160
real time and make sure we are

163
00:05:15,590 --> 00:05:13,680

coordinating that between the russian

164
00:05:17,510 --> 00:05:15,600
u.s teams so that both teams understand

165
00:05:18,950 --> 00:05:17,520
the impacts to not only the russian

166
00:05:21,510 --> 00:05:18,960
segment and the u.s segment but to the

167
00:05:23,670 --> 00:05:21,520
soyuz or progress vehicle itself

168
00:05:26,150 --> 00:05:23,680
a visiting vehicle officer handles all

169
00:05:28,390 --> 00:05:26,160
types of visiting spacecraft for a long

170
00:05:30,790 --> 00:05:28,400
time that involved only soyuz in

171
00:05:32,790 --> 00:05:30,800
progress spacecraft but now you have the

172
00:05:35,350 --> 00:05:32,800
japanese h2 transfer vehicle the

173
00:05:37,670 --> 00:05:35,360
european automated transfer vehicle the

174
00:05:39,430 --> 00:05:37,680
newly developed spacex dragoncraft and

175
00:05:41,749 --> 00:05:39,440
soon the orbital sciences cygnus

176
00:05:43,670 --> 00:05:41,759
spacecraft so what are the differences

177
00:05:45,350 --> 00:05:43,680
in the planning and are there vehicles

178
00:05:48,070 --> 00:05:45,360
that are easier than others in your

179
00:05:50,070 --> 00:05:48,080
complex work to prepare for a mission

180
00:05:51,110 --> 00:05:50,080
that's a great great question they're i

181
00:05:52,629 --> 00:05:51,120
would say they're all challenging in

182
00:05:55,590 --> 00:05:52,639
their own ways

183
00:05:56,710 --> 00:05:55,600
we kind of divide them into two groups

184
00:05:58,629 --> 00:05:56,720
that are basically what we call the

185
00:06:01,270 --> 00:05:58,639
docking vehicles which are the soyuz in

186
00:06:02,710 --> 00:06:01,280
progress and then the atv which all dock

187
00:06:03,670 --> 00:06:02,720
at the russian segment

188
00:06:05,830 --> 00:06:03,680

and then you have what we call the

189
00:06:09,590 --> 00:06:05,840
grapple vehicles which are

190
00:06:11,830 --> 00:06:09,600
htv and dragon and the upcoming cygnus

191
00:06:14,390 --> 00:06:11,840
who which are all grappled um by the

192
00:06:16,469 --> 00:06:14,400
crew using the ssrms and then birthed at

193
00:06:19,350 --> 00:06:16,479
the us segment

194
00:06:21,510 --> 00:06:19,360
so they're really very different tasks

195
00:06:22,710 --> 00:06:21,520
the the docking vehicles

196
00:06:24,550 --> 00:06:22,720
the crew

197
00:06:27,909 --> 00:06:24,560
on the station or in the case of soyuz

198
00:06:29,670 --> 00:06:27,919
the crew on the soyuz are obviously

199
00:06:32,070 --> 00:06:29,680
you know trying to monitor how the

200
00:06:33,990 --> 00:06:32,080
automated system is working and

201
00:06:36,629 --> 00:06:34,000
basically be prepared for any off

202
00:06:40,150 --> 00:06:36,639
nominal situation that may require them

203
00:06:42,710 --> 00:06:40,160
to perform a response whether that be

204
00:06:44,469 --> 00:06:42,720
take manual control or even just send

205
00:06:46,710 --> 00:06:44,479
the vehicle away

206
00:06:48,629 --> 00:06:46,720
for the grapple vehicles it's similar in

207
00:06:50,469 --> 00:06:48,639
the sense that again your monitor the

208
00:06:52,309 --> 00:06:50,479
crew is monitoring those vehicles to

209
00:06:53,990 --> 00:06:52,319
make sure that uh if an off nominal

210
00:06:56,150 --> 00:06:54,000
situation occurs that they're prepared

211
00:06:58,710 --> 00:06:56,160
to uh to send those vehicles away they

212
00:07:00,150 --> 00:06:58,720
don't have manual control capability um

213
00:07:02,150 --> 00:07:00,160

but then they also have the other task

214
00:07:04,629 --> 00:07:02,160
of actually going out and grabbing those

215
00:07:06,790 --> 00:07:04,639
vehicles with the ssrms

216
00:07:08,710 --> 00:07:06,800
and our team is involved in both of

217
00:07:10,870 --> 00:07:08,720
those processes obviously on the grapple

218
00:07:13,270 --> 00:07:10,880
side we're working very closely with the

219
00:07:14,230 --> 00:07:13,280
robos who are responsible for the ssrms

220
00:07:16,550 --> 00:07:14,240
piece

221
00:07:17,990 --> 00:07:16,560
and the ground of course is uh watching

222
00:07:20,070 --> 00:07:18,000
the vehicles as well and involved in

223
00:07:22,309 --> 00:07:20,080
that monitoring process and helping make

224
00:07:24,469 --> 00:07:22,319
sure the crew can respond if necessary

225
00:07:25,990 --> 00:07:24,479
to an off nominal situation

226
00:07:27,990 --> 00:07:26,000
aside from the fact there are no

227
00:07:29,830 --> 00:07:28,000
passengers how is preparing for a

228
00:07:31,830 --> 00:07:29,840
progress launch to docking sequence

229
00:07:34,230 --> 00:07:31,840
different from a soyuz

230
00:07:37,589 --> 00:07:34,240
with the soyuz

231
00:07:39,670 --> 00:07:37,599
the soyuz crew has a very you know

232
00:07:42,070 --> 00:07:39,680
detailed training and detailed flight

233
00:07:45,350 --> 00:07:42,080
data procedure that tells them how to

234
00:07:47,350 --> 00:07:45,360
respond to certain off novel situations

235
00:07:48,869 --> 00:07:47,360
uh with the progress since there's no

236
00:07:50,710 --> 00:07:48,879
crew on board

237
00:07:52,309 --> 00:07:50,720
all of that has to be built in to the

238
00:07:54,390 --> 00:07:52,319

progress vehicle itself until it gets

239
00:07:55,909 --> 00:07:54,400
really you know relatively close you

240
00:07:57,909 --> 00:07:55,919
know from space terms

241
00:07:59,270 --> 00:07:57,919
i would say you know within say less

242
00:08:01,270 --> 00:07:59,280
than a kilometer

243
00:08:02,710 --> 00:08:01,280
before you can really even think about

244
00:08:04,150 --> 00:08:02,720
you know doing anything from the from

245
00:08:05,350 --> 00:08:04,160
the station side in terms of manual

246
00:08:06,070 --> 00:08:05,360
control

247
00:08:11,029 --> 00:08:06,080
so

248
00:08:13,270 --> 00:08:11,039
obviously do things at a further range

249
00:08:14,390 --> 00:08:13,280
and still be safe with the progress you

250
00:08:16,629 --> 00:08:14,400
really have to build that into the

251
00:08:18,629 --> 00:08:16,639
vehicle with all that said the russians

252
00:08:20,070 --> 00:08:18,639
have done a really good job of making

253
00:08:21,909 --> 00:08:20,080
those vehicles

254
00:08:23,189 --> 00:08:21,919
essentially similar and really

255
00:08:24,790 --> 00:08:23,199
completely similar from the flight

256
00:08:27,189 --> 00:08:24,800
dynamics perspective

257
00:08:29,430 --> 00:08:27,199
so in terms of the automation for

258
00:08:31,670 --> 00:08:29,440
the guidance and navigation and control

259
00:08:33,509 --> 00:08:31,680
and the safety of those functions in off

260
00:08:35,909 --> 00:08:33,519
nominal situations

261
00:08:37,430 --> 00:08:35,919
the automated part is exactly the same

262
00:08:39,029 --> 00:08:37,440
between those two vehicles so there's

263
00:08:40,630 --> 00:08:39,039

really no difference

264
00:08:42,230 --> 00:08:40,640
the only difference is that you have the

265
00:08:44,550 --> 00:08:42,240
crew on the soyuz that once you get

266
00:08:46,389 --> 00:08:44,560
beyond the capabilities of the automated

267
00:08:48,470 --> 00:08:46,399
system that the the soyuz crew is

268
00:08:49,910 --> 00:08:48,480
obviously there and can do some certain

269
00:08:51,190 --> 00:08:49,920
things whereas with the progress you'd

270
00:08:52,870 --> 00:08:51,200
have to wait until the progress was a

271
00:08:55,509 --> 00:08:52,880
little closer before the iss crew could

272
00:08:57,509 --> 00:08:55,519
do something using the remote control

273
00:08:59,030 --> 00:08:57,519
tom you've done this job for some time

274
00:09:01,030 --> 00:08:59,040
what do you like the most about your

275
00:09:02,550 --> 00:09:01,040
role as a visiting vehicle officer and

276
00:09:05,190 --> 00:09:02,560
what do you think people would find most

277
00:09:06,470 --> 00:09:05,200
surprising about your job

278
00:09:08,550 --> 00:09:06,480
the answer to those questions is

279
00:09:10,470 --> 00:09:08,560
actually somewhat the same

280
00:09:12,710 --> 00:09:10,480
one of the things i enjoy most about my

281
00:09:14,790 --> 00:09:12,720
job in my case since i work strictly on

282
00:09:16,550 --> 00:09:14,800
the russian vehicle side of things

283
00:09:18,470 --> 00:09:16,560
is working with the russians it's very

284
00:09:20,070 --> 00:09:18,480
interesting to work with them because

285
00:09:21,829 --> 00:09:20,080
even though we have a similar

286
00:09:23,750 --> 00:09:21,839
engineering culture

287
00:09:25,829 --> 00:09:23,760
obviously the social culture background

288
00:09:26,870 --> 00:09:25,839

is very different and those things you

289
00:09:28,790 --> 00:09:26,880
know

290
00:09:30,870 --> 00:09:28,800
permeate each other in a working

291
00:09:32,310 --> 00:09:30,880
environment so you have to

292
00:09:34,710 --> 00:09:32,320
if not understand although that's

293
00:09:36,870 --> 00:09:34,720
obviously best at least be cognizant of

294
00:09:39,350 --> 00:09:36,880
those social cultural differences and

295
00:09:40,389 --> 00:09:39,360
how they affect how you work with each

296
00:09:42,070 --> 00:09:40,399
other

297
00:09:43,269 --> 00:09:42,080
so understanding those things is a

298
00:09:45,030 --> 00:09:43,279
really cool

299
00:09:47,030 --> 00:09:45,040
learning task and then you know really

300
00:09:48,550 --> 00:09:47,040
interesting in person to to work with

301
00:09:49,990 --> 00:09:48,560
them and

302
00:09:51,670 --> 00:09:50,000
learn how that works you know learn

303
00:09:52,550 --> 00:09:51,680
about their culture teach them about

304
00:09:54,630 --> 00:09:52,560
ours

305
00:09:56,230 --> 00:09:54,640
uh it's a really good good give and take

306
00:09:58,310 --> 00:09:56,240
on both sides and i have found that to

307
00:10:01,110 --> 00:09:58,320
be one of the most uh

308
00:10:02,470 --> 00:10:01,120
interesting parts of my overall job

309
00:10:04,550 --> 00:10:02,480
and i would say that that's actually one

310
00:10:05,910 --> 00:10:04,560
of the most surprising things to people

311
00:10:07,910 --> 00:10:05,920
you know if they ask me what do i do and

312
00:10:09,509 --> 00:10:07,920
i tell them i'm vvo and

313
00:10:11,030 --> 00:10:09,519

what my job is here

314
00:10:12,550 --> 00:10:11,040
you know i tell them i would work with

315
00:10:13,430 --> 00:10:12,560
international partners

316
00:10:16,870 --> 00:10:13,440
and

317
00:10:18,550 --> 00:10:16,880
is that the you know there's so much

318
00:10:20,630 --> 00:10:18,560
cultural understanding that kind of has

319
00:10:22,069 --> 00:10:20,640
to go on in the background to really

320
00:10:25,670 --> 00:10:22,079
help

321
00:10:27,190 --> 00:10:25,680
do

322
00:10:28,790 --> 00:10:27,200
tell us a little bit about yourself and

323
00:10:31,190 --> 00:10:28,800
how you came to work on behalf of

324
00:10:33,190 --> 00:10:31,200
mission and flight operations when i was

325
00:10:35,990 --> 00:10:33,200
an undergrad student at the university

326
00:10:37,670 --> 00:10:36,000
of illinois in urbana-champaign uh the

327
00:10:39,350 --> 00:10:37,680
cooperative education student

328
00:10:42,230 --> 00:10:39,360
coordinator actually came and did

329
00:10:44,069 --> 00:10:42,240
interviews on campus so i interviewed

330
00:10:46,470 --> 00:10:44,079
and i was fortunate enough to uh to get

331
00:10:49,990 --> 00:10:46,480
that job as a a co-op student

332
00:10:52,230 --> 00:10:50,000
i did four tours here at jsc

333
00:10:54,550 --> 00:10:52,240
basically four semesters worth of work

334
00:10:56,230 --> 00:10:54,560
uh three in engineering and my very last

335
00:10:58,710 --> 00:10:56,240
one in mod

336
00:11:00,150 --> 00:10:58,720
and uh was fortunate enough to to be

337
00:11:01,750 --> 00:11:00,160
transitioned to full time after i

338
00:11:03,110 --> 00:11:01,760

graduated from my with my undergrad

339
00:11:04,470 --> 00:11:03,120
degree so i was transitioned from a

340
00:11:06,870 --> 00:11:04,480
co-op to a full-time student or a

341
00:11:08,470 --> 00:11:06,880
full-time employee i'm sorry and i've

342
00:11:11,509 --> 00:11:08,480
been doing that ever since so i've been

343
00:11:13,190 --> 00:11:11,519
here full-time since 1994 and

344
00:11:15,190 --> 00:11:13,200
i've been basically in mod flight

345
00:11:16,710 --> 00:11:15,200
dynamics the whole time in various

346
00:11:19,750 --> 00:11:16,720
different positions but i've been

347
00:11:21,269 --> 00:11:19,760
working the vvo job

348
00:11:23,670 --> 00:11:21,279
pretty much since the

349
00:11:26,150 --> 00:11:23,680
1996 to 1998 time frame that's when i

350
00:11:27,030 --> 00:11:26,160
first started working with the russians

351
00:11:30,870 --> 00:11:27,040
on

352
00:11:32,949 --> 00:11:30,880
uh how their vehicles would be coming to

353
00:11:34,790 --> 00:11:32,959
the space station um you know how we

354
00:11:37,269 --> 00:11:34,800
could do that safely between the u.s and

355
00:11:38,710 --> 00:11:37,279
russian segment impacts

356
00:11:40,550 --> 00:11:38,720
and how we would do the real-time

357
00:11:43,110 --> 00:11:40,560
operations as well and that's really

358
00:11:45,430 --> 00:11:43,120
where the vvo job came into being was

359
00:11:47,030 --> 00:11:45,440
understanding that having an interface

360
00:11:48,470 --> 00:11:47,040
to discuss

361
00:11:50,629 --> 00:11:48,480
and work out

362
00:11:51,829 --> 00:11:50,639
both in advance of the flight and in

363
00:11:53,509 --> 00:11:51,839

real time

364
00:11:55,350 --> 00:11:53,519
any issues that might happen while their

365
00:11:57,269 --> 00:11:55,360
vehicle is coming in

366
00:11:59,750 --> 00:11:57,279
it became obvious you know pretty early

367
00:12:02,069 --> 00:11:59,760
on that that was a smart thing to do

368
00:12:04,310 --> 00:12:02,079
as you probably know

369
00:12:05,750 --> 00:12:04,320
mod and jsc has a function similar to

370
00:12:07,350 --> 00:12:05,760
that called the houston support group

371
00:12:09,910 --> 00:12:07,360
that does that

372
00:12:11,829 --> 00:12:09,920
from a bigger picture for the overall

373
00:12:14,150 --> 00:12:11,839
integration of the russian segment and

374
00:12:15,670 --> 00:12:14,160
us segment where they provide that

375
00:12:18,150 --> 00:12:15,680
interface

376
00:12:20,389 --> 00:12:18,160
and so what our job is is similar to

377
00:12:22,230 --> 00:12:20,399
that but focused mostly on the the

378
00:12:23,269 --> 00:12:22,240
flight dynamics and guidance navigation

379
00:12:25,190 --> 00:12:23,279
function

380
00:12:27,190 --> 00:12:25,200
for rendezvous and docking and also for

381
00:12:28,949 --> 00:12:27,200
undocking and separation just because

382
00:12:30,470 --> 00:12:28,959
those are such critical time frames with

383
00:12:32,310 --> 00:12:30,480
those vehicles being in the vicinity of

384
00:12:34,710 --> 00:12:32,320
the space station

385
00:12:36,470 --> 00:12:34,720
tom arkanswick veteran visiting vehicle

386
00:12:38,870 --> 00:12:36,480
officer and an expert in russian flight

387
00:12:40,389 --> 00:12:38,880
operations joining us today just hours

388
00:12:42,470 --> 00:12:40,399

before the docking of a new progress