
XXX

1
00:00:05,110 --> 00:00:03,429
good afternoon thank you for joining us

2
00:00:07,829 --> 00:00:05,120
for our news conference with members of

3
00:00:10,790 --> 00:00:07,839
the expedition 29 and 30 cruise

4
00:00:13,110 --> 00:00:10,800
to my left is nasa astronaut dan burbank

5
00:00:16,150 --> 00:00:13,120
dan was born in manchester connecticut

6
00:00:18,310 --> 00:00:16,160
50 years ago today happy birthday dan he

7
00:00:21,189 --> 00:00:18,320
considers yarmouth port massachusetts to

8
00:00:23,429 --> 00:00:21,199
be his home he joined nasa in 1996 and

9
00:00:27,990 --> 00:00:23,439
has flown on two prior missions he flew

10
00:00:29,669 --> 00:00:28,000
on sts-106 in 2000 and sts-115 in 2006.

11
00:00:32,389 --> 00:00:29,679
he and his crewmates will launch on a

12
00:00:34,549 --> 00:00:32,399
soyuz spacecraft on september 22nd from

13
00:00:36,549 --> 00:00:34,559

kazakhstan for a six-month mission to

14
00:00:38,310 --> 00:00:36,559
the international space station

15
00:00:40,470 --> 00:00:38,320
we'll let dan introduce his crew thank

16
00:00:41,830 --> 00:00:40,480
you thanks very much nicole thanks very

17
00:00:43,830 --> 00:00:41,840
much and it's uh it's great to be here

18
00:00:45,990 --> 00:00:43,840
with you today

19
00:00:48,389 --> 00:00:46,000
my myself my crewmates we've just kind

20
00:00:50,869 --> 00:00:48,399
of come to the end of a of a pretty long

21
00:00:52,069 --> 00:00:50,879
and uh an event-filled two years of

22
00:00:53,750 --> 00:00:52,079
training to get ready to fly this

23
00:00:56,069 --> 00:00:53,760
mission having having been to the space

24
00:00:58,790 --> 00:00:56,079
station twice on board shuttle missions

25
00:01:00,869 --> 00:00:58,800
uh for me anyways it was enough just to

26
00:01:02,869 --> 00:01:00,879
wet my appetite for space flight so the

27
00:01:05,270 --> 00:01:02,879
opportunity to spend six months on board

28
00:01:07,190 --> 00:01:05,280
station is something i really look

29
00:01:08,950 --> 00:01:07,200
forward to and i'm also very much

30
00:01:11,109 --> 00:01:08,960
looking forward to flying with two very

31
00:01:13,590 --> 00:01:11,119
good friends of mine um here to the left

32
00:01:16,469 --> 00:01:13,600
and two exceptionally talented cosmonaut

33
00:01:18,469 --> 00:01:16,479
uh pilot engineers and uh to my left

34
00:01:19,590 --> 00:01:18,479
immediately is uh anton nikolayovich

35
00:01:21,429 --> 00:01:19,600
gaplerov

36
00:01:24,630 --> 00:01:21,439
he's a colonel in the russian air force

37
00:01:27,910 --> 00:01:24,640
uh he and his wife tatiana are both from

38
00:01:30,390 --> 00:01:27,920

sevastopol in crimea in ukraine and they

39
00:01:32,550 --> 00:01:30,400
have two daughters christina and kara

40
00:01:34,149 --> 00:01:32,560
anton was a licensed pilot before he

41
00:01:36,630 --> 00:01:34,159
finished high school which is more than

42
00:01:38,550 --> 00:01:36,640
i can say for myself

43
00:01:40,710 --> 00:01:38,560
he graduated from kaczynski air force

44
00:01:43,190 --> 00:01:40,720
flight school in 1994 as a pilot

45
00:01:44,950 --> 00:01:43,200
engineer with a degree in aeronautical

46
00:01:48,149 --> 00:01:44,960
engineering he was a senior instructor

47
00:01:51,350 --> 00:01:48,159
pilot he flew the yak 52 the l-29 and

48
00:01:52,870 --> 00:01:51,360
mig-29 and he was also an instructor in

49
00:01:54,469 --> 00:01:52,880
general parachute training with hundreds

50
00:01:56,789 --> 00:01:54,479
of jumps to his credit

51
00:01:59,109 --> 00:01:56,799
he was selected as a cosmonaut in may of

52
00:02:00,550 --> 00:01:59,119
2003 and worked

53
00:02:02,389 --> 00:02:00,560
for a period of about six or eight

54
00:02:04,550 --> 00:02:02,399
months here in uh at the johnson space

55
00:02:07,670 --> 00:02:04,560
center as the representative for ross

56
00:02:09,109 --> 00:02:07,680
cosmos the russian space agency as the

57
00:02:10,229 --> 00:02:09,119
director of their operations here in

58
00:02:12,470 --> 00:02:10,239
houston

59
00:02:13,910 --> 00:02:12,480
and uh he is the commander of our soyuz

60
00:02:17,030 --> 00:02:13,920
and he'll be a flight engineer on board

61
00:02:19,830 --> 00:02:17,040
the iss with me uh he's already trained

62
00:02:22,229 --> 00:02:19,840
twice to be a backup

63
00:02:24,470 --> 00:02:22,239

crew member for previous cruise and this

64
00:02:25,510 --> 00:02:24,480
is his third training flow and uh very

65
00:02:26,630 --> 00:02:25,520
much looking forward to flying with

66
00:02:29,350 --> 00:02:26,640
anton

67
00:02:31,830 --> 00:02:29,360
genton's left is anatoly alexeiwicz

68
00:02:33,190 --> 00:02:31,840
ivanishin anatoly is a

69
00:02:35,350 --> 00:02:33,200
lieutenant colonel in the russian air

70
00:02:38,949 --> 00:02:35,360
force he and his wife svetlana are from

71
00:02:40,630 --> 00:02:38,959
irkutsk which is about 2500 miles east

72
00:02:42,710 --> 00:02:40,640
of moscow

73
00:02:45,350 --> 00:02:42,720
on the shores of lake baikal the world's

74
00:02:47,270 --> 00:02:45,360
oldest and deepest lake and in a real

75
00:02:48,869 --> 00:02:47,280
beautiful region of wilderness there

76
00:02:50,390 --> 00:02:48,879
they have one son vladislav who's in

77
00:02:53,110 --> 00:02:50,400
college studying

78
00:02:55,030 --> 00:02:53,120
computer engineering um tulia attended

79
00:02:56,710 --> 00:02:55,040
irkutsk polytechnic institute in

80
00:02:59,430 --> 00:02:56,720
chernogov higher military aviation

81
00:03:01,990 --> 00:02:59,440
school graduating with honors in 91 and

82
00:03:03,910 --> 00:03:02,000
in 2003 he graduated from moscow state

83
00:03:06,790 --> 00:03:03,920
university with degrees in economics

84
00:03:09,589 --> 00:03:06,800
statistics and information theory in the

85
00:03:11,589 --> 00:03:09,599
air force he flew mig-29 and the su-27

86
00:03:12,470 --> 00:03:11,599
he like anton has hundreds of parachute

87
00:03:14,070 --> 00:03:12,480
jumps

88
00:03:16,470 --> 00:03:14,080

i have zero

89
00:03:18,869 --> 00:03:16,480
that he was selected with as was anton

90
00:03:20,309 --> 00:03:18,879
in 2003 as a cosmonaut

91
00:03:21,750 --> 00:03:20,319
and he'll be a flight engineer on board

92
00:03:23,910 --> 00:03:21,760
the soyuz that we're launching on and

93
00:03:25,430 --> 00:03:23,920
also on board space station and again

94
00:03:28,070 --> 00:03:25,440
two two great friends and very much

95
00:03:29,990 --> 00:03:28,080
looking forward to flying with them

96
00:03:32,070 --> 00:03:30,000
i could give you a summary maybe if that

97
00:03:33,830 --> 00:03:32,080
would be useful just of the the major

98
00:03:35,589 --> 00:03:33,840
events we have planned for the

99
00:03:37,910 --> 00:03:35,599
expedition and we can maybe use that as

100
00:03:39,990 --> 00:03:37,920
a as a branching point if folks have

101
00:03:41,910 --> 00:03:40,000
some questions

102
00:03:44,550 --> 00:03:41,920
i guess if i were to summarize one thing

103
00:03:46,630 --> 00:03:44,560
about how our expedition perhaps differs

104
00:03:48,470 --> 00:03:46,640
a little bit from the previous ones is

105
00:03:50,869 --> 00:03:48,480
the emphasis is squarely shifting

106
00:03:52,390 --> 00:03:50,879
towards utilization of research on board

107
00:03:53,429 --> 00:03:52,400
the space station as being the primary

108
00:03:55,429 --> 00:03:53,439
goal

109
00:03:57,589 --> 00:03:55,439
up until now assembly has really been

110
00:03:59,670 --> 00:03:57,599
the major focus and

111
00:04:01,350 --> 00:03:59,680
with the uh the recently completed last

112
00:04:02,710 --> 00:04:01,360
launch of the shuttle all the major

113
00:04:03,910 --> 00:04:02,720

heavy lifting's been done in space

114
00:04:06,070 --> 00:04:03,920
station is

115
00:04:07,990 --> 00:04:06,080
essentially at an assembly complete

116
00:04:10,309 --> 00:04:08,000
phase we do have some

117
00:04:12,149 --> 00:04:10,319
operational and assembly type activities

118
00:04:15,110 --> 00:04:12,159
that we plan on board space station but

119
00:04:16,949 --> 00:04:15,120
again research is the focus um for the

120
00:04:18,710 --> 00:04:16,959
big picture operational events uh like

121
00:04:21,509 --> 00:04:18,720
nicole had mentioned we're launching on

122
00:04:23,990 --> 00:04:21,519
september 22nd docking on on september

123
00:04:27,030 --> 00:04:24,000
24th and uh when we get there we'll be

124
00:04:28,629 --> 00:04:27,040
joining mike fossum uh sergey volkov and

125
00:04:29,909 --> 00:04:28,639
satoshi furukawa

126
00:04:31,590 --> 00:04:29,919
and we'll spend about two months with

127
00:04:33,510 --> 00:04:31,600
them and then they will leave and

128
00:04:36,629 --> 00:04:33,520
shortly thereafter um at the very

129
00:04:38,790 --> 00:04:36,639
beginning of december um we'll there

130
00:04:41,270 --> 00:04:38,800
those three will be replaced with uh

131
00:04:43,670 --> 00:04:41,280
with three other friends alek kononenko

132
00:04:45,510 --> 00:04:43,680
and don pettit and andre kuipers from

133
00:04:47,590 --> 00:04:45,520
esa and we'll spend another almost four

134
00:04:50,150 --> 00:04:47,600
months with them and our expedition is

135
00:04:52,950 --> 00:04:50,160
scheduled to last until about the mid of

136
00:04:54,790 --> 00:04:52,960
middle of march when we return

137
00:04:56,150 --> 00:04:54,800
and we've got

138
00:04:58,870 --> 00:04:56,160

some visiting vehicles that we're very

139
00:05:00,469 --> 00:04:58,880
much uh hoping and looking forward to to

140
00:05:02,629 --> 00:05:00,479
seeing while while we're on board space

141
00:05:04,950 --> 00:05:02,639
station uh one of which at least and

142
00:05:07,430 --> 00:05:04,960
hopefully more will be the first of the

143
00:05:09,749 --> 00:05:07,440
commercial uh resupply ships that will

144
00:05:11,270 --> 00:05:09,759
come to space station and that'll be a

145
00:05:12,629 --> 00:05:11,280
busy time leading up to that but

146
00:05:14,070 --> 00:05:12,639
something i think we're all looking

147
00:05:16,710 --> 00:05:14,080
forward to

148
00:05:19,909 --> 00:05:16,720
we have one spacewalk planned and anton

149
00:05:22,390 --> 00:05:19,919
can talk to uh to the details on that

150
00:05:23,590 --> 00:05:22,400
and another thing that we have planned

151
00:05:25,510 --> 00:05:23,600
that sort of

152
00:05:27,670 --> 00:05:25,520
falls in line with some of the assembly

153
00:05:29,670 --> 00:05:27,680
or at least upgrade kinds of events is

154
00:05:31,749 --> 00:05:29,680
we've got a pretty major

155
00:05:32,950 --> 00:05:31,759
planned upgrade of the space station

156
00:05:35,510 --> 00:05:32,960
avionics

157
00:05:37,189 --> 00:05:35,520
including the computers on board and and

158
00:05:39,029 --> 00:05:37,199
the communication system such that we

159
00:05:40,469 --> 00:05:39,039
can increase the bandwidth the amount of

160
00:05:42,950 --> 00:05:40,479
data that we're able to exchange with

161
00:05:44,390 --> 00:05:42,960
the earth and uh kind of in a nutshell

162
00:05:46,870 --> 00:05:44,400
if i were to encapsulate at least the

163
00:05:49,189 --> 00:05:46,880

things that we can plan that's uh that's

164
00:05:51,189 --> 00:05:49,199
pretty much our expedition for the six

165
00:05:53,270 --> 00:05:51,199
months we'll be there all right

166
00:05:54,629 --> 00:05:53,280
did one antoine want to

167
00:05:56,469 --> 00:05:54,639
give me your remarks

168
00:05:57,749 --> 00:05:56,479
okay with that we'll open it up for

169
00:05:59,990 --> 00:05:57,759
questions here from the johnson space

170
00:06:01,350 --> 00:06:00,000
center

171
00:06:02,550 --> 00:06:01,360
go ahead

172
00:06:05,270 --> 00:06:02,560
um hi robert perlman with

173
00:06:07,430 --> 00:06:05,280
collectspace.com um you mentioned this

174
00:06:09,670 --> 00:06:07,440
transition over to utilization

175
00:06:13,189 --> 00:06:09,680
how is your training differed if at all

176
00:06:15,510 --> 00:06:13,199
um to prepare for uh being more of a

177
00:06:16,550 --> 00:06:15,520
research crew than an assembly crew

178
00:06:19,110 --> 00:06:16,560
right

179
00:06:21,350 --> 00:06:19,120
i guess in the big picture not a lot

180
00:06:22,870 --> 00:06:21,360
robert we're still we always and all the

181
00:06:25,189 --> 00:06:22,880
crews leading up till now have uh

182
00:06:27,430 --> 00:06:25,199
trained on the payload so the science

183
00:06:29,670 --> 00:06:27,440
end of it's always been an emphasis um

184
00:06:31,749 --> 00:06:29,680
there's a lot of the training that we do

185
00:06:33,830 --> 00:06:31,759
that prepares us for certain kinds of

186
00:06:35,909 --> 00:06:33,840
contingencies that that probably aren't

187
00:06:38,390 --> 00:06:35,919
necessarily in the science uh research

188
00:06:40,469 --> 00:06:38,400

end of it i think the reality of the way

189
00:06:42,870 --> 00:06:40,479
space station research is conducted is a

190
00:06:45,670 --> 00:06:42,880
lot of it is conducted remotely by

191
00:06:49,189 --> 00:06:45,680
scientists and researchers on the ground

192
00:06:50,870 --> 00:06:49,199
we get a chance to participate with that

193
00:06:52,390 --> 00:06:50,880
sometimes almost the level of being a

194
00:06:53,189 --> 00:06:52,400
co-investigator

195
00:06:57,430 --> 00:06:53,199
but

196
00:06:58,790 --> 00:06:57,440
and maybe just being a source of the

197
00:07:01,029 --> 00:06:58,800
data as a

198
00:07:02,790 --> 00:07:01,039
as a lab rat if you will

199
00:07:04,710 --> 00:07:02,800
but but a lot of that kind of work

200
00:07:06,150 --> 00:07:04,720
because the primary responsibilities of

201
00:07:08,790 --> 00:07:06,160
the folks on the ground

202
00:07:10,629 --> 00:07:08,800
the details of that we will get chunks

203
00:07:12,870 --> 00:07:10,639
of training throughout the

204
00:07:14,550 --> 00:07:12,880
two years plus that we train together

205
00:07:16,550 --> 00:07:14,560
and a lot of the things we can actually

206
00:07:17,670 --> 00:07:16,560
do real time and learn about those on

207
00:07:20,070 --> 00:07:17,680
orbit so

208
00:07:21,430 --> 00:07:20,080
so we'd recently we had previously had

209
00:07:23,189 --> 00:07:21,440
about a four year training flow it's

210
00:07:25,430 --> 00:07:23,199
down to two and a half or less right now

211
00:07:27,909 --> 00:07:25,440
which means it's pretty aggressively

212
00:07:30,710 --> 00:07:27,919
targeted at all the contingency kinds of

213
00:07:32,550 --> 00:07:30,720

things the emergency things the uh

214
00:07:34,629 --> 00:07:32,560
eva training robotics training some

215
00:07:36,070 --> 00:07:34,639
things which if everything goes well you

216
00:07:37,270 --> 00:07:36,080
may not ever do

217
00:07:40,309 --> 00:07:37,280
so

218
00:07:43,670 --> 00:07:40,319
i don't know if that answers it but

219
00:07:46,230 --> 00:07:43,680
um yes thanks and um as you're going to

220
00:07:48,469 --> 00:07:46,240
be the uh the first full expedition

221
00:07:50,950 --> 00:07:48,479
without the space shuttle so without

222
00:07:52,869 --> 00:07:50,960
really a guaranteed down mass capability

223
00:07:54,869 --> 00:07:52,879
has there been more constraints put on

224
00:07:57,670 --> 00:07:54,879
either your personal items being taken

225
00:08:00,390 --> 00:07:57,680
up or or how you do science results in

226
00:08:03,589 --> 00:08:00,400
terms of delivering that data or objects

227
00:08:06,950 --> 00:08:05,510
well down mass is a critical capability

228
00:08:09,029 --> 00:08:06,960
that the shuttle has given us for a long

229
00:08:11,270 --> 00:08:09,039
long time and so far it's been the only

230
00:08:13,270 --> 00:08:11,280
vehicle that can return

231
00:08:15,029 --> 00:08:13,280
the science results if those are in the

232
00:08:17,110 --> 00:08:15,039
form of samples for example the only

233
00:08:19,270 --> 00:08:17,120
only vehicle that could return

234
00:08:20,869 --> 00:08:19,280
hardware back to earth so if we want to

235
00:08:22,309 --> 00:08:20,879
uh for example with the pump module

236
00:08:24,469 --> 00:08:22,319
issue we had on board space station if

237
00:08:25,990 --> 00:08:24,479
we want to be able to diagnose it to

238
00:08:27,830 --> 00:08:26,000

look at it and see what had happened so

239
00:08:31,510 --> 00:08:27,840
we can learn from it the shuttle was

240
00:08:34,630 --> 00:08:31,520
gave us a great opportunity to do that

241
00:08:35,990 --> 00:08:34,640
as far as the up mass goes with sts-135

242
00:08:37,589 --> 00:08:36,000
and a couple of missions leading up to

243
00:08:39,589 --> 00:08:37,599
it space station is actually in a really

244
00:08:40,709 --> 00:08:39,599
good posture right now for logistics and

245
00:08:43,029 --> 00:08:40,719
we have

246
00:08:44,470 --> 00:08:43,039
more than enough to allow us to

247
00:08:47,030 --> 00:08:44,480
basically do all the things we need to

248
00:08:49,750 --> 00:08:47,040
do on station for for at least a year so

249
00:08:50,550 --> 00:08:49,760
we're in a good situation with regard to

250
00:08:52,230 --> 00:08:50,560
that

251
00:08:53,670 --> 00:08:52,240
the only planned vehicle in the near

252
00:08:55,350 --> 00:08:53,680
term that would give us the capability

253
00:08:57,590 --> 00:08:55,360
of returning significant amount of down

254
00:08:59,190 --> 00:08:57,600
mass would be the spacex dragon vehicle

255
00:09:01,110 --> 00:08:59,200
we can bring some

256
00:09:03,670 --> 00:09:01,120
materials back with us on the soyuz and

257
00:09:06,710 --> 00:09:03,680
we've done that for quite a while too

258
00:09:09,750 --> 00:09:06,720
what we have done with sts-135 returning

259
00:09:11,750 --> 00:09:09,760
is we basically took the huge stockpile

260
00:09:13,269 --> 00:09:11,760
of things that needed to come back from

261
00:09:16,070 --> 00:09:13,279
station a lot of those biological

262
00:09:17,670 --> 00:09:16,080
samples and basically emptied all of our

263
00:09:19,190 --> 00:09:17,680

reserves for that and returned them all

264
00:09:20,630 --> 00:09:19,200
to the laboratories on the ground to

265
00:09:22,790 --> 00:09:20,640
work on

266
00:09:24,230 --> 00:09:22,800
we hope to see spacex in early december

267
00:09:26,150 --> 00:09:24,240
and if we do we hope to get some down

268
00:09:28,310 --> 00:09:26,160
mass capability we create capability

269
00:09:29,670 --> 00:09:28,320
with that vehicle and uh and again

270
00:09:31,350 --> 00:09:29,680
that's a that's a really important

271
00:09:33,269 --> 00:09:31,360
capability we'd like to have long term

272
00:09:35,829 --> 00:09:33,279
the things that you can do

273
00:09:37,910 --> 00:09:35,839
via telescience that is if you can do

274
00:09:40,550 --> 00:09:37,920
analysis on the on the science you're

275
00:09:43,269 --> 00:09:40,560
doing and send data down to the ground

276
00:09:44,710 --> 00:09:43,279
for them to remotely uh analyze it

277
00:09:47,030 --> 00:09:44,720
that's something that the upgrades to

278
00:09:48,310 --> 00:09:47,040
the avionics will help but there's still

279
00:09:52,470 --> 00:09:48,320
a lot of things we want to be able to

280
00:09:57,110 --> 00:09:54,230
bill harwich cbs with a couple of

281
00:09:58,470 --> 00:09:57,120
questions and i'll start with you dan

282
00:09:59,990 --> 00:09:58,480
just kind of following on that this is

283
00:10:01,509 --> 00:10:00,000
the first flight in the absence of the

284
00:10:03,350 --> 00:10:01,519
space shuttle and it's kind of sets the

285
00:10:05,110 --> 00:10:03,360
tone for the the next era in the

286
00:10:07,110 --> 00:10:05,120
station's evolution

287
00:10:08,470 --> 00:10:07,120
um what's your confidence level going

288
00:10:10,389 --> 00:10:08,480

into this you mentioned a minute ago

289
00:10:11,750 --> 00:10:10,399
those are the things you could plan and

290
00:10:13,190 --> 00:10:11,760
tell us about but things that are

291
00:10:15,350 --> 00:10:13,200
unplanned happen and you've lost the

292
00:10:17,190 --> 00:10:15,360
ability to carry heavy components up

293
00:10:18,710 --> 00:10:17,200
maybe just your confidence in

294
00:10:20,710 --> 00:10:18,720
in continuing station operations in the

295
00:10:22,150 --> 00:10:20,720
absence of shuttle and the spares that

296
00:10:23,750 --> 00:10:22,160
are available on board just all that

297
00:10:26,150 --> 00:10:23,760
kind of stuff

298
00:10:28,389 --> 00:10:26,160
as far as com my confidence on on space

299
00:10:30,949 --> 00:10:28,399
station being able to continue given the

300
00:10:33,350 --> 00:10:30,959
logistics situation we have on board

301
00:10:35,350 --> 00:10:33,360
i am really confident about that we have

302
00:10:37,509 --> 00:10:35,360
the outside of space station we have put

303
00:10:39,030 --> 00:10:37,519
in every location we could all kinds of

304
00:10:41,350 --> 00:10:39,040
external stores for all the big

305
00:10:43,269 --> 00:10:41,360
equipment that could that we potentially

306
00:10:45,590 --> 00:10:43,279
could foresee having an issue with

307
00:10:47,829 --> 00:10:45,600
um inside space station we have tons and

308
00:10:50,870 --> 00:10:47,839
tons of logistics ranging from food and

309
00:10:52,949 --> 00:10:50,880
water uh right up to the various um

310
00:10:54,550 --> 00:10:52,959
experiments and science equipment and

311
00:10:58,310 --> 00:10:54,560
lots and lots of spares for the things

312
00:11:01,590 --> 00:10:58,320
that are in an inside station as well

313
00:11:03,509 --> 00:11:01,600

in general i would say this

314
00:11:05,590 --> 00:11:03,519
the time i think is right i think and i

315
00:11:06,710 --> 00:11:05,600
hate to see the shuttle uh be retired

316
00:11:08,710 --> 00:11:06,720
frankly as someone who's had the

317
00:11:10,550 --> 00:11:08,720
privilege to fly twice on it

318
00:11:12,470 --> 00:11:10,560
um it's a it's a sad thing when we

319
00:11:14,710 --> 00:11:12,480
retire any space vehicle you know from

320
00:11:16,949 --> 00:11:14,720
at least from an operator's perspective

321
00:11:19,030 --> 00:11:16,959
and the space shuttle was exquisitely

322
00:11:21,030 --> 00:11:19,040
well designed to do the kinds of things

323
00:11:22,870 --> 00:11:21,040
it has done now for decades

324
00:11:26,949 --> 00:11:22,880
and again it was the capability to

325
00:11:31,430 --> 00:11:29,750
i think low earth orbit it's probably

326
00:11:33,670 --> 00:11:31,440
the right time now to come up with a

327
00:11:35,430 --> 00:11:33,680
different kind of capability i think

328
00:11:37,110 --> 00:11:35,440
getting from planet earth the surface of

329
00:11:39,910 --> 00:11:37,120
planet earth to low earth orbit now is

330
00:11:41,509 --> 00:11:39,920
within the reasonable reach of

331
00:11:43,030 --> 00:11:41,519
commercial companies and i really do

332
00:11:45,590 --> 00:11:43,040
applaud that it's this is a very

333
00:11:47,750 --> 00:11:45,600
exciting time in that respect i think i

334
00:11:49,430 --> 00:11:47,760
think nasa's job it always should be and

335
00:11:51,030 --> 00:11:49,440
probably always has been you know at

336
00:11:52,310 --> 00:11:51,040
least certainly in the very very early

337
00:11:53,829 --> 00:11:52,320
days and

338
00:11:55,269 --> 00:11:53,839

you know i think it always should be

339
00:11:57,269 --> 00:11:55,279
doing the hardest the very hardest

340
00:11:59,350 --> 00:11:57,279
things you can do i think it's right for

341
00:12:01,509 --> 00:11:59,360
us to to get in to leave low earth orbit

342
00:12:03,910 --> 00:12:01,519
get into deep space and

343
00:12:05,829 --> 00:12:03,920
and those destinations range as you know

344
00:12:08,150 --> 00:12:05,839
from asteroids to the moon to mars

345
00:12:10,389 --> 00:12:08,160
there's lots of great places to go and

346
00:12:12,389 --> 00:12:10,399
and but all of those things require a

347
00:12:14,629 --> 00:12:12,399
very different we require us to redirect

348
00:12:16,069 --> 00:12:14,639
the resources that we've got and so i

349
00:12:18,710 --> 00:12:16,079
think it's an appropriate thing for the

350
00:12:20,790 --> 00:12:18,720
government to to absorb and shoulder the

351
00:12:22,590 --> 00:12:20,800
high risk you know potentially higher

352
00:12:24,790 --> 00:12:22,600
costs of developing heavy launch

353
00:12:27,190 --> 00:12:24,800
capability and

354
00:12:29,030 --> 00:12:27,200
and crew vehicles that are designed to

355
00:12:31,430 --> 00:12:29,040
do deep space type missions that's a

356
00:12:33,750 --> 00:12:31,440
good thing and for us to contract the

357
00:12:34,870 --> 00:12:33,760
services to get to low or to and from

358
00:12:37,110 --> 00:12:34,880
low earth orbit i think it's a good

359
00:12:39,190 --> 00:12:37,120
thing now with all that said space

360
00:12:40,870 --> 00:12:39,200
flight is still really hard it just is i

361
00:12:41,750 --> 00:12:40,880
mean it's it's right at the ragged edge

362
00:12:45,509 --> 00:12:41,760
of what

363
00:12:47,190 --> 00:12:45,519

know about material science and

364
00:12:48,790 --> 00:12:47,200
propulsion technology and everything

365
00:12:51,269 --> 00:12:48,800
else it's it's just a very tough

366
00:12:53,750 --> 00:12:51,279
business and we've seen some some very

367
00:12:56,710 --> 00:12:53,760
impressive

368
00:12:58,550 --> 00:12:56,720
innovations and designs on the part of

369
00:13:00,870 --> 00:12:58,560
the the commercial

370
00:13:02,230 --> 00:13:00,880
resupply contractors and we've also seen

371
00:13:04,310 --> 00:13:02,240
some good indications that they'll be

372
00:13:07,190 --> 00:13:04,320
the capability before you know hopefully

373
00:13:09,110 --> 00:13:07,200
too much longer down the road of having

374
00:13:10,470 --> 00:13:09,120
of human you know launching capability

375
00:13:12,230 --> 00:13:10,480
on commercial vehicles that's a good

376
00:13:14,069 --> 00:13:12,240
thing i think

377
00:13:15,430 --> 00:13:14,079
space station i don't worry about it

378
00:13:18,150 --> 00:13:15,440
we're covered for the immediate near

379
00:13:19,990 --> 00:13:18,160
term and i would love to see things

380
00:13:22,790 --> 00:13:20,000
accelerate a pace the more vehicles we

381
00:13:24,629 --> 00:13:22,800
can have that can get us to uh to space

382
00:13:26,790 --> 00:13:24,639
the better it is and the the healthier

383
00:13:28,790 --> 00:13:26,800
it will make our space program

384
00:13:30,710 --> 00:13:28,800
as an international effort

385
00:13:33,110 --> 00:13:30,720
thank you um and one question the same

386
00:13:35,509 --> 00:13:33,120
question for anatoly and anton

387
00:13:37,269 --> 00:13:35,519
what are you looking forward to the most

388
00:13:38,870 --> 00:13:37,279

for your first space flight i mean what

389
00:13:40,230 --> 00:13:38,880
is it that you're you want to do when

390
00:13:46,870 --> 00:13:40,240
you get there and what are you looking

391
00:13:51,590 --> 00:13:49,350
i have not been to space before

392
00:13:53,030 --> 00:13:51,600
so i am looking forward to feel

393
00:13:54,870 --> 00:13:53,040
something

394
00:13:56,150 --> 00:13:54,880
which which i have never experienced

395
00:13:58,629 --> 00:13:56,160
before

396
00:14:00,150 --> 00:13:58,639
uh it would be extremely interesting for

397
00:14:03,350 --> 00:14:00,160
me to see

398
00:14:05,430 --> 00:14:03,360
a blue planet with my own eyes of course

399
00:14:08,550 --> 00:14:05,440
i have seen it a lot of times

400
00:14:09,910 --> 00:14:08,560
as a pictures made by cosmonauts

401
00:14:12,310 --> 00:14:09,920
astronauts

402
00:14:13,829 --> 00:14:12,320
satellites but i really believe that

403
00:14:16,790 --> 00:14:13,839
when you see it

404
00:14:20,150 --> 00:14:16,800
by your own it's something

405
00:14:23,670 --> 00:14:22,069
i'm looking forward to

406
00:14:26,790 --> 00:14:23,680
meet the current

407
00:14:29,269 --> 00:14:26,800
international space station group

408
00:14:31,670 --> 00:14:29,279
it happened that i spent a

409
00:14:33,910 --> 00:14:31,680
certain amount of time

410
00:14:35,670 --> 00:14:33,920
preparing to the space flight together

411
00:14:38,230 --> 00:14:35,680
with satoshi and mike

412
00:14:40,949 --> 00:14:38,240
he used to be a backup for democracy

413
00:14:43,189 --> 00:14:40,959

power so i know these guys very well

414
00:14:46,310 --> 00:14:43,199
and i'm really looking forward to see

415
00:14:49,030 --> 00:14:46,320
them in in the new conditions for me of

416
00:14:51,670 --> 00:14:49,040
course they have already acquainted to

417
00:14:52,949 --> 00:14:51,680
the space environment but it will be new

418
00:14:55,110 --> 00:14:52,959
for me

419
00:14:57,430 --> 00:14:55,120
and

420
00:14:59,350 --> 00:14:57,440
i'm looking forward for my job on board

421
00:15:02,150 --> 00:14:59,360
the station

422
00:15:05,509 --> 00:15:02,160
i do believe that experiments

423
00:15:09,110 --> 00:15:05,519
cosmonauts and australians conduct in

424
00:15:12,949 --> 00:15:09,120
cosmo conducting space

425
00:15:16,949 --> 00:15:12,959
helps human beings to to reveal

426
00:15:18,550 --> 00:15:16,959
mysteries of nature

427
00:15:20,710 --> 00:15:18,560
and we

428
00:15:21,670 --> 00:15:20,720
are going to do experiments in many

429
00:15:24,829 --> 00:15:21,680
areas

430
00:15:24,839 --> 00:15:29,269
medicine biological

431
00:15:36,629 --> 00:15:33,430
geophysics remote earth sensing

432
00:15:42,069 --> 00:15:39,030
material space material science

433
00:15:43,829 --> 00:15:42,079
and i really believe that this work will

434
00:16:26,389 --> 00:15:43,839
help to improve

435
00:16:30,629 --> 00:16:28,550
i would like to say that the iss is a

436
00:16:32,470 --> 00:16:30,639
really unique environment and it

437
00:16:35,590 --> 00:16:32,480
presents us unique opportunities to

438
00:16:38,230 --> 00:16:35,600

experience zero tree loads overloads and

439
00:16:41,269 --> 00:16:38,240
unique conditions in which to

440
00:16:42,870 --> 00:16:41,279
test and to conduct experiments i

441
00:16:46,629 --> 00:16:42,880
believe this is really important and i

442
00:16:49,430 --> 00:16:46,639
look forward to doing this in space

443
00:16:51,509 --> 00:16:49,440
all right thank you jill

444
00:16:53,430 --> 00:16:51,519
jill tolk representing bay area houston

445
00:16:55,269 --> 00:16:53,440
magazine with a couple questions uh

446
00:16:56,550 --> 00:16:55,279
first of all for dan i had interviewed

447
00:16:59,509 --> 00:16:56,560
steve bone

448
00:17:01,269 --> 00:16:59,519
recently where he had that unscheduled

449
00:17:03,189 --> 00:17:01,279
sts-133

450
00:17:06,549 --> 00:17:03,199
flight plus the spacewalks and he

451
00:17:08,150 --> 00:17:06,559
described that event as a good model

452
00:17:10,230 --> 00:17:08,160
moving forward for the international

453
00:17:11,429 --> 00:17:10,240
space station where of course astronauts

454
00:17:12,949 --> 00:17:11,439
are trained

455
00:17:15,350 --> 00:17:12,959
for skills

456
00:17:17,429 --> 00:17:15,360
rather than just tasks for the iss so

457
00:17:19,669 --> 00:17:17,439
could you expand on his comments a bit

458
00:17:22,789 --> 00:17:19,679
yeah that's a that's a great point jill

459
00:17:23,990 --> 00:17:22,799
and uh and steve said it well

460
00:17:25,189 --> 00:17:24,000
the way we approach training on the

461
00:17:26,789 --> 00:17:25,199
shuttle is very different than the way

462
00:17:28,789 --> 00:17:26,799
we can reasonably approach training on

463
00:17:31,110 --> 00:17:28,799

the space station the shuttle

464
00:17:33,190 --> 00:17:31,120
partly because of the the way that it

465
00:17:34,950 --> 00:17:33,200
flies in such a dynamic environment and

466
00:17:35,830 --> 00:17:34,960
also because the crew is at a much

467
00:17:37,510 --> 00:17:35,840
greater

468
00:17:40,150 --> 00:17:37,520
at least percentage of the time involved

469
00:17:41,830 --> 00:17:40,160
directly in controlling the vehicle

470
00:17:43,270 --> 00:17:41,840
we're able and the missions are shorter

471
00:17:45,350 --> 00:17:43,280
probably is another huge thing we're

472
00:17:47,510 --> 00:17:45,360
able to train to what we would we call

473
00:17:49,669 --> 00:17:47,520
in our communities here at task based

474
00:17:50,789 --> 00:17:49,679
level and what that means is you as a

475
00:17:53,510 --> 00:17:50,799
crew member

476
00:17:55,990 --> 00:17:53,520
are basically trained to know that if

477
00:17:59,110 --> 00:17:56,000
this light comes on this tone is in your

478
00:18:01,750 --> 00:17:59,120
ear and this little indication on the on

479
00:18:03,909 --> 00:18:01,760
a panel goes to this configuration that

480
00:18:05,430 --> 00:18:03,919
it means such and such has happened and

481
00:18:07,510 --> 00:18:05,440
you know without almost without even

482
00:18:09,669 --> 00:18:07,520
thinking that i need to do these one two

483
00:18:11,190 --> 00:18:09,679
three four five steps or whatever and we

484
00:18:13,110 --> 00:18:11,200
can do that by training literally

485
00:18:14,549 --> 00:18:13,120
hundreds or thousands sometimes you know

486
00:18:16,230 --> 00:18:14,559
over the years

487
00:18:17,510 --> 00:18:16,240
ascent runs and entry runs in the

488
00:18:18,789 --> 00:18:17,520

simulator

489
00:18:21,270 --> 00:18:18,799
and if you're going to train for a

490
00:18:22,789 --> 00:18:21,280
two-week mission you can do that

491
00:18:24,470 --> 00:18:22,799
on space station you got a million

492
00:18:27,190 --> 00:18:24,480
pounds almost of hardware and it's

493
00:18:28,950 --> 00:18:27,200
unbelievably expensive and and like i

494
00:18:31,270 --> 00:18:28,960
alluded to a little bit earlier the the

495
00:18:33,430 --> 00:18:31,280
ground to a much greater degree

496
00:18:35,430 --> 00:18:33,440
is actually directly controlling the

497
00:18:38,150 --> 00:18:35,440
systems and uh you know more so than

498
00:18:39,830 --> 00:18:38,160
they do on the shuttle or have um so so

499
00:18:41,350 --> 00:18:39,840
maybe 80 of the vehicle is being

500
00:18:43,590 --> 00:18:41,360
directly controlled by people here in

501
00:18:45,029 --> 00:18:43,600
houston people in moscow people in

502
00:18:47,270 --> 00:18:45,039
europe japan

503
00:18:50,070 --> 00:18:47,280
and we are there to facilitate and help

504
00:18:51,830 --> 00:18:50,080
with the things that only crews can do

505
00:18:54,789 --> 00:18:51,840
the space station now that it's up in

506
00:18:56,310 --> 00:18:54,799
space is going to basically continue to

507
00:18:57,750 --> 00:18:56,320
fall if you will around the earth so

508
00:18:59,190 --> 00:18:57,760
there's not a lot of things that can

509
00:19:01,750 --> 00:18:59,200
happen that no kidding the crew has to

510
00:19:03,510 --> 00:19:01,760
be able to respond to very very quickly

511
00:19:05,430 --> 00:19:03,520
so what we try to do is we try to give

512
00:19:09,029 --> 00:19:05,440
the crew

513
00:19:11,110 --> 00:19:09,039

a toolbox of skills basically teach them

514
00:19:12,950 --> 00:19:11,120
you know basic kinds of things generally

515
00:19:15,110 --> 00:19:12,960
how such and such a system works what

516
00:19:17,110 --> 00:19:15,120
are the the particular things to watch

517
00:19:18,870 --> 00:19:17,120
out for when you're doing this activity

518
00:19:20,470 --> 00:19:18,880
and then the idea is that with that

519
00:19:23,350 --> 00:19:20,480
skill set they can apply it and

520
00:19:25,510 --> 00:19:23,360
basically quickly learn through

521
00:19:27,990 --> 00:19:25,520
what we call on orbit training where we

522
00:19:29,669 --> 00:19:28,000
can uplink files uplink we have actually

523
00:19:31,669 --> 00:19:29,679
have simulators for certain activities

524
00:19:33,590 --> 00:19:31,679
we can actually practice in orbit and

525
00:19:35,750 --> 00:19:33,600
then learn how to do it and then go out

526
00:19:37,430 --> 00:19:35,760
perhaps next week or the week after and

527
00:19:39,669 --> 00:19:37,440
be able to do maybe a very complicated

528
00:19:41,669 --> 00:19:39,679
series of evas or we could

529
00:19:43,590 --> 00:19:41,679
repair a piece of hardware that we maybe

530
00:19:45,270 --> 00:19:43,600
never saw in pieces on a bench in front

531
00:19:46,710 --> 00:19:45,280
of us but the thing that's hard about

532
00:19:47,669 --> 00:19:46,720
that at least on the maintenance end of

533
00:19:49,830 --> 00:19:47,679
it i think

534
00:19:51,190 --> 00:19:49,840
is that with the shuttle anytime that

535
00:19:52,950 --> 00:19:51,200
that something might have happened where

536
00:19:54,789 --> 00:19:52,960
the crew had to fix it

537
00:19:56,390 --> 00:19:54,799
you always knew that all you had to do

538
00:19:57,590 --> 00:19:56,400

was stabilize the system and then you

539
00:19:59,590 --> 00:19:57,600
were going to return it to these

540
00:20:01,909 --> 00:19:59,600
brilliant professionals at ksc who had

541
00:20:03,510 --> 00:20:01,919
taken care of it all their lives and and

542
00:20:05,750 --> 00:20:03,520
so the crew's job there from a

543
00:20:07,350 --> 00:20:05,760
maintenance perspective was jury rig

544
00:20:08,950 --> 00:20:07,360
something patch it together like the

545
00:20:10,630 --> 00:20:08,960
ground tells you and it's going to go to

546
00:20:13,110 --> 00:20:10,640
somebody who's going to make it

547
00:20:14,390 --> 00:20:13,120
basically you know pristine in a very

548
00:20:15,990 --> 00:20:14,400
very short period of time and space

549
00:20:18,070 --> 00:20:16,000
station we can't do that space station

550
00:20:19,669 --> 00:20:18,080
suddenly crews potentially

551
00:20:21,909 --> 00:20:19,679
have to do the kinds of repairs that are

552
00:20:23,270 --> 00:20:21,919
commensurate with what people that have

553
00:20:24,789 --> 00:20:23,280
done it all their lives have done on the

554
00:20:27,110 --> 00:20:24,799
ground so it's a challenge that we're

555
00:20:28,710 --> 00:20:27,120
we're facing but but again generally you

556
00:20:30,789 --> 00:20:28,720
have the time to do things you can do it

557
00:20:32,710 --> 00:20:30,799
methodically we can teach ourselves with

558
00:20:35,029 --> 00:20:32,720
the grounds help how to do things and

559
00:20:36,789 --> 00:20:35,039
and skills based is really the practical

560
00:20:40,070 --> 00:20:36,799
way to do it and i i think it's we're

561
00:20:43,029 --> 00:20:41,830
thanks for the good words

562
00:20:45,590 --> 00:20:43,039
um

563
00:20:48,470 --> 00:20:45,600

a related question for antonin or

564
00:20:51,110 --> 00:20:48,480
anatali whoever would like to take it

565
00:20:52,870 --> 00:20:51,120
we've heard the american side of space

566
00:20:55,110 --> 00:20:52,880
walking but i wanted to get a russian

567
00:20:55,909 --> 00:20:55,120
perspective too because

568
00:20:57,909 --> 00:20:55,919
you know

569
00:21:01,510 --> 00:20:57,919
russians didn't necessarily rely on the

570
00:21:03,990 --> 00:21:01,520
space shuttle but what is the russian

571
00:21:06,230 --> 00:21:04,000
contribution for spacewalking let's say

572
00:21:12,149 --> 00:21:06,240
for the next year or two

573
00:21:16,950 --> 00:21:14,710
we are going to perform one way from

574
00:21:18,870 --> 00:21:16,960
russian side

575
00:21:21,669 --> 00:21:18,880
it's interesting to point out that the

576
00:21:23,510 --> 00:21:21,679
number of a coincides with the number

577
00:21:25,110 --> 00:21:23,520
for increment when it's going to be

578
00:21:28,710 --> 00:21:25,120
conducted

579
00:21:31,669 --> 00:21:28,720
and anton and alec are going to be the

580
00:21:32,470 --> 00:21:31,679
operators who will go outside

581
00:21:34,230 --> 00:21:32,480
and

582
00:21:36,710 --> 00:21:34,240
the tasks for

583
00:21:37,990 --> 00:21:36,720
this mission is

584
00:21:39,590 --> 00:21:38,000
to install

585
00:21:41,510 --> 00:21:39,600
a

586
00:21:44,630 --> 00:21:41,520
protective shield

587
00:21:45,669 --> 00:21:44,640
to the same external surface

588
00:21:48,470 --> 00:21:45,679

and

589
00:21:51,270 --> 00:21:48,480
to conduct a couple of experiments

590
00:21:52,789 --> 00:21:51,280
and one of them is

591
00:21:54,549 --> 00:21:52,799
windows lowest

592
00:21:58,149 --> 00:21:54,559
the name of the experiment can be

593
00:21:59,430 --> 00:21:58,159
translated into english as endurance

594
00:22:02,390 --> 00:21:59,440
it's a

595
00:22:03,510 --> 00:22:02,400
brand one brand new one

596
00:22:07,110 --> 00:22:03,520
and

597
00:22:11,350 --> 00:22:08,710
how space

598
00:22:13,669 --> 00:22:11,360
environment impacts

599
00:22:16,149 --> 00:22:13,679
mechanical properties

600
00:22:18,710 --> 00:22:16,159
of materials

601
00:22:19,510 --> 00:22:18,720
intended for space

602
00:22:24,149 --> 00:22:19,520
and

603
00:22:28,070 --> 00:22:24,159
are going to

604
00:22:30,549 --> 00:22:28,080
transfer a unit which consists of

605
00:22:32,549 --> 00:22:30,559
two trays

606
00:22:33,510 --> 00:22:32,559
to mrm2

607
00:22:35,909 --> 00:22:33,520
and

608
00:22:37,590 --> 00:22:35,919
at the external surface of mrm2 they

609
00:22:38,870 --> 00:22:37,600
will install

610
00:22:42,470 --> 00:22:38,880
two trays

611
00:22:44,470 --> 00:22:42,480
each of them consists of

612
00:22:48,630 --> 00:22:44,480
metal samples

613
00:22:51,510 --> 00:22:48,640

and these samples will be exposed to the

614
00:22:55,430 --> 00:22:51,520
spacing environment for

615
00:22:58,230 --> 00:22:55,440
a year and for three years

616
00:22:59,190 --> 00:22:58,240
then they will be returned to earth

617
00:23:01,750 --> 00:22:59,200
and

618
00:23:05,029 --> 00:23:01,760
the novelty of this experiment

619
00:23:08,230 --> 00:23:05,039
the materials will be exposed

620
00:23:11,110 --> 00:23:08,240
under the condition of real space flight

621
00:23:12,230 --> 00:23:11,120
are subject to loads and not subject to

622
00:23:13,029 --> 00:23:12,240
loads

623
00:23:15,110 --> 00:23:13,039
and

624
00:23:16,390 --> 00:23:15,120
they will they'll be at the same

625
00:23:19,190 --> 00:23:16,400
conditions

626
00:23:22,630 --> 00:23:19,200
and the modules itself

627
00:23:23,990 --> 00:23:22,640
and this experiment becomes especially

628
00:23:25,350 --> 00:23:24,000
important

629
00:23:26,870 --> 00:23:25,360
today

630
00:23:28,070 --> 00:23:26,880
when we see

631
00:23:30,470 --> 00:23:28,080
growth

632
00:23:33,029 --> 00:23:30,480
in development of

633
00:23:34,950 --> 00:23:33,039
space machines

634
00:23:37,510 --> 00:23:34,960
which

635
00:23:39,350 --> 00:23:37,520
has set a series of tasks

636
00:23:43,029 --> 00:23:39,360
regarding

637
00:23:44,870 --> 00:23:43,039
uh designing and creating

638
00:23:48,630 --> 00:23:44,880

new space systems

639
00:23:52,070 --> 00:23:48,640
as well space systems of new generation

640
00:23:55,590 --> 00:23:52,080
as well as space material science

641
00:24:00,789 --> 00:23:55,600
and i hope anton can add what i have

642
00:24:00,799 --> 00:24:30,310
which is

643
00:24:30,320 --> 00:25:17,750
um

644
00:25:23,110 --> 00:25:20,870
uh yes i'd like to add to what uh

645
00:25:25,830 --> 00:25:23,120
anatoly said about the eva i'm going to

646
00:25:27,750 --> 00:25:25,840
perform with oleg we're going to sample

647
00:25:30,230 --> 00:25:27,760
the resident

648
00:25:31,990 --> 00:25:30,240
substances that are left on the station

649
00:25:33,750 --> 00:25:32,000
on the outside for that we have a

650
00:25:37,110 --> 00:25:33,760
special kit we have

651
00:25:39,190 --> 00:25:37,120
cotton swabs and we'll try and sample

652
00:25:40,630 --> 00:25:39,200
those substances and then we'll send the

653
00:25:41,430 --> 00:25:40,640
results to the ground

654
00:25:43,669 --> 00:25:41,440
and

655
00:25:46,149 --> 00:25:43,679
that's why that's how we'll know what

656
00:25:48,710 --> 00:25:46,159
settles on the construction the station

657
00:25:51,510 --> 00:25:48,720
outside and that will help determine for

658
00:25:53,590 --> 00:25:51,520
how long the station can be in operation

659
00:25:56,390 --> 00:25:53,600
uh they know what the age of the iss is

660
00:25:57,190 --> 00:25:56,400
already 11 years plus

661
00:25:59,430 --> 00:25:57,200
and

662
00:26:02,070 --> 00:25:59,440
uh we'll know we'll find out whether the

663
00:26:04,549 --> 00:26:02,080

station can survive uh and be safe till

664
00:26:06,470 --> 00:26:04,559
2020 and maybe beyond this will be a

665
00:26:08,230 --> 00:26:06,480
contribution for the heads of the agency

666
00:26:10,230 --> 00:26:08,240
to decide where to do the station next

667
00:26:13,669 --> 00:26:10,240
and how long it can be in operation

668
00:26:17,990 --> 00:26:15,830
all right next question hello swain

669
00:26:20,070 --> 00:26:18,000
reporting for the bay area observer

670
00:26:22,870 --> 00:26:20,080
um this question is directed to dan

671
00:26:25,029 --> 00:26:22,880
burbank as the first mission after the

672
00:26:26,310 --> 00:26:25,039
space shuttle's uh programs end what

673
00:26:29,269 --> 00:26:26,320
historical significance do you think

674
00:26:31,110 --> 00:26:29,279
this expedition has

675
00:26:33,990 --> 00:26:31,120
well apart from that apart from the fact

676
00:26:36,070 --> 00:26:34,000
that it'll be the first mission

677
00:26:38,870 --> 00:26:36,080
that'll be you know continuously run

678
00:26:39,830 --> 00:26:38,880
without the capability of of the shuttle

679
00:26:40,950 --> 00:26:39,840
to be there

680
00:26:42,789 --> 00:26:40,960
um

681
00:26:45,990 --> 00:26:42,799
i think what it really represents is

682
00:26:48,149 --> 00:26:46,000
this transition from space station uh

683
00:26:49,110 --> 00:26:48,159
being in an assembly mode basically

684
00:26:52,950 --> 00:26:49,120
being

685
00:26:54,710 --> 00:26:52,960
built as it's flying through the air

686
00:26:56,630 --> 00:26:54,720
space station has been very much that

687
00:26:58,230 --> 00:26:56,640
it's got pieces and parts assembled all

688
00:27:00,230 --> 00:26:58,240

over the world

689
00:27:01,830 --> 00:27:00,240
most of which never actually came into

690
00:27:03,269 --> 00:27:01,840
contact with each other before they did

691
00:27:07,190 --> 00:27:03,279
in space

692
00:27:09,590 --> 00:27:07,200
it was a very complicated thing uh just

693
00:27:11,590 --> 00:27:09,600
incredible and very impressive and very

694
00:27:13,190 --> 00:27:11,600
uplifting that it went as well as it did

695
00:27:14,789 --> 00:27:13,200
and the things that we learned as we

696
00:27:16,710 --> 00:27:14,799
assembled it

697
00:27:18,470 --> 00:27:16,720
were are going to be invaluable down the

698
00:27:21,269 --> 00:27:18,480
road the shuttle played a major part in

699
00:27:23,590 --> 00:27:21,279
that space station's now a very capable

700
00:27:26,070 --> 00:27:23,600
world-class research facility in orbit a

701
00:27:27,830 --> 00:27:26,080
very unique place and it's something

702
00:27:29,830 --> 00:27:27,840
that i think is going to enjoy a long

703
00:27:31,590 --> 00:27:29,840
legacy

704
00:27:33,430 --> 00:27:31,600
as anton mentioned you know we've

705
00:27:34,870 --> 00:27:33,440
already all agreed international

706
00:27:35,909 --> 00:27:34,880
partners that are that are members of

707
00:27:37,909 --> 00:27:35,919
this team

708
00:27:40,470 --> 00:27:37,919
that the space station will be operated

709
00:27:42,710 --> 00:27:40,480
out till 2020 and and i hope and i

710
00:27:45,430 --> 00:27:42,720
expect it'll be operated quite a bit

711
00:27:48,149 --> 00:27:45,440
longer than that but um

712
00:27:50,470 --> 00:27:48,159
but now that assembly is complete it's

713
00:27:52,870 --> 00:27:50,480

time to actually get our return on the

714
00:27:54,470 --> 00:27:52,880
investment and start to concentrate on

715
00:27:56,710 --> 00:27:54,480
the science and research that space

716
00:27:58,630 --> 00:27:56,720
station was built and intended for so

717
00:28:00,389 --> 00:27:58,640
we'll have basically six people for the

718
00:28:01,750 --> 00:28:00,399
foreseeable future living and perhaps

719
00:28:03,830 --> 00:28:01,760
more down the road but for the

720
00:28:06,070 --> 00:28:03,840
foreseeable future living and working

721
00:28:07,430 --> 00:28:06,080
you know on space station with hundreds

722
00:28:09,909 --> 00:28:07,440
of people all over the world that are

723
00:28:13,269 --> 00:28:09,919
also attending experiments and operating

724
00:28:14,710 --> 00:28:13,279
those 24 7 365 and

725
00:28:15,750 --> 00:28:14,720
and i think we've already seen some of

726
00:28:18,470 --> 00:28:15,760
the benefits of that we're going to

727
00:28:19,909 --> 00:28:18,480
continue to see more for us all three of

728
00:28:21,669 --> 00:28:19,919
us being coming from pilot and

729
00:28:23,830 --> 00:28:21,679
engineering backgrounds to get an

730
00:28:25,110 --> 00:28:23,840
opportunity to do the science just as

731
00:28:26,710 --> 00:28:25,120
tulia had mentioned and anton had

732
00:28:29,110 --> 00:28:26,720
mentioned to get an opportunity to be a

733
00:28:31,909 --> 00:28:29,120
part of that and to participate in the

734
00:28:33,909 --> 00:28:31,919
science and research aspect is uh is

735
00:28:35,909 --> 00:28:33,919
really neat and uh and i think it's a

736
00:28:38,789 --> 00:28:35,919
credit to our organizations that we've

737
00:28:41,110 --> 00:28:38,799
we've uh we have taken operator trained

738
00:28:43,029 --> 00:28:41,120

people and engineers like ourselves and

739
00:28:44,870 --> 00:28:43,039
given us a broad basis skills that'll

740
00:28:48,070 --> 00:28:44,880
hopefully allow us to contribute in a

741
00:28:50,149 --> 00:28:48,080
good way on it so i guess the history

742
00:28:51,750 --> 00:28:50,159
is that this is the beginning of a new

743
00:28:53,990 --> 00:28:51,760
era without the capability of the

744
00:28:55,350 --> 00:28:54,000
shuttle but we've also got a number of

745
00:28:58,710 --> 00:28:55,360
vehicles right around the corner that

746
00:29:00,630 --> 00:28:58,720
are going to help to to fill that gap

747
00:29:02,310 --> 00:29:00,640
all right

748
00:29:03,830 --> 00:29:02,320
okay we're going to switch over to the

749
00:29:07,830 --> 00:29:03,840
kennedy space center where we have two

750
00:29:11,909 --> 00:29:09,830
thanks nicole it's irene klotz with

751
00:29:13,110 --> 00:29:11,919
reuters i have a couple questions for

752
00:29:15,190 --> 00:29:13,120
dan i think

753
00:29:17,750 --> 00:29:15,200
could you describe in detail the

754
00:29:19,990 --> 00:29:17,760
training that you've had for dragon

755
00:29:22,230 --> 00:29:20,000
operations and if you've had any for

756
00:29:24,950 --> 00:29:22,240
sickness as well and also who's prime

757
00:29:27,110 --> 00:29:24,960
and who's back up for uh for those

758
00:29:29,269 --> 00:29:27,120
spacecraft operations

759
00:29:31,350 --> 00:29:29,279
um i guess i would uh say just in

760
00:29:32,389 --> 00:29:31,360
general that uh that the visiting we

761
00:29:33,909 --> 00:29:32,399
already have some experience with

762
00:29:37,110 --> 00:29:33,919
visiting vehicles

763
00:29:39,190 --> 00:29:37,120

that have come the way that dragon and

764
00:29:40,630 --> 00:29:39,200
cygnus the orbital sciences vehicle will

765
00:29:43,510 --> 00:29:40,640
come to station

766
00:29:46,470 --> 00:29:43,520
we've had two hope transfer vehicles htv

767
00:29:48,149 --> 00:29:46,480
1 and htv 2 that already came to station

768
00:29:49,830 --> 00:29:48,159
and the way those vehicles work at least

769
00:29:51,190 --> 00:29:49,840
from the perspective of the operations

770
00:29:53,029 --> 00:29:51,200
that we conduct

771
00:29:55,029 --> 00:29:53,039
leading up to that it'll be essentially

772
00:29:56,789 --> 00:29:55,039
transparent to the crew our operations

773
00:29:59,029 --> 00:29:56,799
as far as

774
00:30:00,630 --> 00:29:59,039
monitoring the rendezvous monitoring the

775
00:30:02,549 --> 00:30:00,640
vehicles as they come up what we call

776
00:30:06,870 --> 00:30:02,559
the r bar towards the space station

777
00:30:08,950 --> 00:30:06,880
forward uh nader or earth-facing side

778
00:30:10,149 --> 00:30:08,960
and then how we track and capture them

779
00:30:12,549 --> 00:30:10,159
ultimately with the space station

780
00:30:15,430 --> 00:30:12,559
robotic arm and then uh mate them to

781
00:30:17,029 --> 00:30:15,440
node two uh those are essentially the

782
00:30:19,350 --> 00:30:17,039
same the arm geometry may be a little

783
00:30:21,430 --> 00:30:19,360
bit different but but the generic skills

784
00:30:24,389 --> 00:30:21,440
that we train in the robotics and in the

785
00:30:26,870 --> 00:30:24,399
visiting vehicle that flows are all the

786
00:30:29,510 --> 00:30:26,880
same um i've been out to uh to the

787
00:30:31,190 --> 00:30:29,520
spacex uh facility in uh in hawthorne

788
00:30:33,110 --> 00:30:31,200

california and i've gotten to see the

789
00:30:34,470 --> 00:30:33,120
vehicle and talk to the people out there

790
00:30:37,190 --> 00:30:34,480
and have

791
00:30:39,909 --> 00:30:37,200
have seen how the logistics for example

792
00:30:42,149 --> 00:30:39,919
um and uh how we will interact with the

793
00:30:44,789 --> 00:30:42,159
vehicle as it's coming up how the the

794
00:30:46,789 --> 00:30:44,799
where's what we call a ccp or uh command

795
00:30:49,029 --> 00:30:46,799
control panel that we use to actually

796
00:30:51,269 --> 00:30:49,039
issue commands to the vehicle um as it

797
00:30:53,269 --> 00:30:51,279
flies up the r bar there's a point where

798
00:30:55,590 --> 00:30:53,279
we'll we'll basically command the

799
00:30:57,350 --> 00:30:55,600
vehicle into free drift so it'll be

800
00:30:58,950 --> 00:30:57,360
after it's station keeping in a stable

801
00:31:01,110 --> 00:30:58,960
fashion beneath space station will

802
00:31:03,590 --> 00:31:01,120
basically tell its motion control system

803
00:31:05,350 --> 00:31:03,600
to stop firing the jets and then it

804
00:31:07,590 --> 00:31:05,360
allows us then at that point to bring

805
00:31:10,230 --> 00:31:07,600
the space station robotic arm up and and

806
00:31:12,549 --> 00:31:10,240
then very gently and and uh and

807
00:31:14,870 --> 00:31:12,559
carefully capture it and then we'll

808
00:31:17,110 --> 00:31:14,880
maneuver it to the uh to uh to mate it

809
00:31:19,350 --> 00:31:17,120
to the node two identical the way we've

810
00:31:21,590 --> 00:31:19,360
done it with htv as well

811
00:31:24,310 --> 00:31:21,600
that piece is probably the most critical

812
00:31:26,549 --> 00:31:24,320
uh piece of the operation

813
00:31:28,549 --> 00:31:26,559

getting a chance to see the vehicle as

814
00:31:30,950 --> 00:31:28,559
we did in hawthorne getting a chance to

815
00:31:33,110 --> 00:31:30,960
see how the the logistics will be stowed

816
00:31:34,789 --> 00:31:33,120
on board that's really not so critical

817
00:31:36,230 --> 00:31:34,799
but i did get a chance to do that it's

818
00:31:38,310 --> 00:31:36,240
the kind of thing that

819
00:31:40,230 --> 00:31:38,320
that i guess as jill had asked earlier

820
00:31:41,029 --> 00:31:40,240
it really kind of falls in the category

821
00:31:44,389 --> 00:31:41,039
of

822
00:31:46,470 --> 00:31:44,399
time critical

823
00:31:49,029 --> 00:31:46,480
we can work and coordinate that with the

824
00:31:51,269 --> 00:31:49,039
ground and uh but but i think it'll be

825
00:31:54,630 --> 00:31:51,279
very similar to what we've had with the

826
00:31:55,909 --> 00:31:54,640
htv uh vehicles before and the mplms and

827
00:31:57,029 --> 00:31:55,919
other

828
00:31:58,549 --> 00:31:57,039
modules that

829
00:32:00,789 --> 00:31:58,559
come up to the space station at least

830
00:32:01,750 --> 00:32:00,799
the docked or mated phase will be the

831
00:32:03,830 --> 00:32:01,760
same

832
00:32:05,669 --> 00:32:03,840
um orbital uh i've

833
00:32:08,950 --> 00:32:05,679
i've learned about the cygnus vehicle

834
00:32:11,029 --> 00:32:08,960
and uh trained here at jsc and uh and

835
00:32:13,430 --> 00:32:11,039
basically about to the same level as far

836
00:32:15,590 --> 00:32:13,440
as the operations in the mated phase and

837
00:32:17,509 --> 00:32:15,600
the robotics we've planned we've done

838
00:32:19,350 --> 00:32:17,519

and i've flown many in the simulator uh

839
00:32:21,750 --> 00:32:19,360
tracking captures with orbital as i have

840
00:32:23,990 --> 00:32:21,760
dragon and the other vehicles so

841
00:32:25,509 --> 00:32:24,000
um don't know if that's uh the answer

842
00:32:27,590 --> 00:32:25,519
you're looking for but but feel pretty

843
00:32:28,950 --> 00:32:27,600
pretty well that i feel pretty good that

844
00:32:30,950 --> 00:32:28,960
that the training we have so far is

845
00:32:32,710 --> 00:32:30,960
adequate and uh and that we've got a

846
00:32:36,950 --> 00:32:32,720
good set of skills to be able to do

847
00:32:42,230 --> 00:32:38,950
i think that's a very thorough answer um

848
00:32:44,389 --> 00:32:42,240
who's your backup for those operations

849
00:32:45,909 --> 00:32:44,399
oh my backup excuse me uh it wasn't

850
00:32:48,230 --> 00:32:45,919
thorough enough

851
00:32:50,310 --> 00:32:48,240
but uh yeah so so depending on the

852
00:32:52,230 --> 00:32:50,320
timing of the vehicles i i think right

853
00:32:54,870 --> 00:32:52,240
now we're looking at the dragon vehicle

854
00:32:56,950 --> 00:32:54,880
the dragon demo uh vehicle to come up in

855
00:32:59,669 --> 00:32:56,960
early december that would potentially if

856
00:33:01,509 --> 00:32:59,679
the dates are stay as planned

857
00:33:04,070 --> 00:33:01,519
mean that that vehicle would arrive at

858
00:33:06,070 --> 00:33:04,080
space station about one week after don

859
00:33:07,750 --> 00:33:06,080
pettit and andre kuipers arrived at

860
00:33:09,190 --> 00:33:07,760
station so that's a very busy time it's

861
00:33:10,630 --> 00:33:09,200
a time for them to begin their

862
00:33:13,750 --> 00:33:10,640
adaptation to

863
00:33:15,190 --> 00:33:13,760

to space station and we also do want to

864
00:33:17,190 --> 00:33:15,200
do a little bit of on-orbit training

865
00:33:18,789 --> 00:33:17,200
together for that i think if those were

866
00:33:21,029 --> 00:33:18,799
the dates that hold then i would be

867
00:33:22,870 --> 00:33:21,039
prime for the track and capture

868
00:33:24,710 --> 00:33:22,880
don would be assisting me with that and

869
00:33:27,110 --> 00:33:24,720
andre would be as well and andre's

870
00:33:28,710 --> 00:33:27,120
primary uh job would probably be uh

871
00:33:30,389 --> 00:33:28,720
operating all the birthing mechanism

872
00:33:32,070 --> 00:33:30,399
though that that part of the operation

873
00:33:33,830 --> 00:33:32,080
but in truth

874
00:33:35,430 --> 00:33:33,840
really all of us on station to a certain

875
00:33:40,070 --> 00:33:35,440
degree are going to be involved in in

876
00:33:43,590 --> 00:33:41,909
thanks and i had one other question

877
00:33:45,590 --> 00:33:43,600
there's a there's an awful lot of empty

878
00:33:48,549 --> 00:33:45,600
parking spaces around here at kennedy

879
00:33:50,070 --> 00:33:48,559
and just was wondering what the uh mood

880
00:33:51,190 --> 00:33:50,080
and what it's been like in the astronaut

881
00:33:52,950 --> 00:33:51,200
office i know i know you're busy

882
00:33:55,110 --> 00:33:52,960
training with your mission but

883
00:33:57,669 --> 00:33:55,120
um just what it's been like there with

884
00:34:00,070 --> 00:33:57,679
this uh transition after shuttle now

885
00:34:02,630 --> 00:34:00,080
underway thank you

886
00:34:03,750 --> 00:34:02,640
yeah and and again you know when i if i

887
00:34:05,350 --> 00:34:03,760
think about this from a personal

888
00:34:07,350 --> 00:34:05,360

standpoint haven't had the

889
00:34:09,510 --> 00:34:07,360
the privilege and honor to fly on

890
00:34:12,790 --> 00:34:09,520
atlantis actually my two flights before

891
00:34:15,990 --> 00:34:12,800
this and to uh to watch atlantis return

892
00:34:18,790 --> 00:34:16,000
home uh and uh to see wheelstop

893
00:34:20,069 --> 00:34:18,800
and to uh to watch the pride and all the

894
00:34:22,310 --> 00:34:20,079
the folks

895
00:34:24,149 --> 00:34:22,320
faces as they watched you know

896
00:34:25,829 --> 00:34:24,159
celebrated the the closing out of this

897
00:34:27,669 --> 00:34:25,839
wonderful program

898
00:34:30,550 --> 00:34:27,679
there's a part of me that

899
00:34:32,069 --> 00:34:30,560
that felt a lot of sadness at that

900
00:34:34,389 --> 00:34:32,079
but it's a very bittersweet moment

901
00:34:36,310 --> 00:34:34,399
because i really do think that we are

902
00:34:38,389 --> 00:34:36,320
setting the stage right now to be able

903
00:34:40,149 --> 00:34:38,399
to do even grander things

904
00:34:42,710 --> 00:34:40,159
the thing that i worry about the most is

905
00:34:44,230 --> 00:34:42,720
that the people that are leaving the

906
00:34:47,430 --> 00:34:44,240
space business and the immediate near

907
00:34:49,909 --> 00:34:47,440
term have some crucial kinds of skills

908
00:34:53,510 --> 00:34:49,919
things that are very very hard

909
00:34:55,109 --> 00:34:53,520
to come by and if we don't get them back

910
00:34:57,030 --> 00:34:55,119
into the fold and get them working on

911
00:34:58,150 --> 00:34:57,040
the new vehicles and helping us with the

912
00:34:59,910 --> 00:34:58,160
next step

913
00:35:02,069 --> 00:34:59,920

then it would be very very difficult for

914
00:35:03,109 --> 00:35:02,079
us to recreate that talent on the fly

915
00:35:06,950 --> 00:35:03,119
and

916
00:35:08,870 --> 00:35:06,960
will

917
00:35:11,670 --> 00:35:08,880
be aggressive and

918
00:35:13,589 --> 00:35:11,680
in our next activities and that we can

919
00:35:15,190 --> 00:35:13,599
return as many of those folks back to

920
00:35:17,750 --> 00:35:15,200
this business as possible and it's

921
00:35:19,510 --> 00:35:17,760
important also beyond just the people

922
00:35:22,069 --> 00:35:19,520
that have had the opportunity to work on

923
00:35:23,510 --> 00:35:22,079
these um spectacular vehicles it's also

924
00:35:25,030 --> 00:35:23,520
really important for us i think as

925
00:35:27,190 --> 00:35:25,040
americans to have

926
00:35:29,670 --> 00:35:27,200
to have space vehicles to be doing this

927
00:35:31,430 --> 00:35:29,680
business we do not spend a lot of money

928
00:35:33,829 --> 00:35:31,440
on the space program when it comes to

929
00:35:35,750 --> 00:35:33,839
you know dollar per dollar it is a very

930
00:35:38,069 --> 00:35:35,760
very small amount when you look at the

931
00:35:39,349 --> 00:35:38,079
u.s federal budget about one half of one

932
00:35:40,310 --> 00:35:39,359
percent

933
00:35:44,310 --> 00:35:40,320
and

934
00:35:46,470 --> 00:35:44,320
little bit of an investment we get an

935
00:35:49,750 --> 00:35:46,480
awful lot of return we get to have a

936
00:35:52,870 --> 00:35:49,760
space station that's manned 24 7 365 and

937
00:35:55,349 --> 00:35:52,880
it is not just a space station it is an

938
00:35:57,190 --> 00:35:55,359

unbelievably impressive place to see

939
00:35:58,390 --> 00:35:57,200
we have all the deep space probes that

940
00:36:00,310 --> 00:35:58,400
have been doing all the research for

941
00:36:01,910 --> 00:36:00,320
nasa for years and years

942
00:36:03,349 --> 00:36:01,920
we have the aeronautics research that

943
00:36:05,910 --> 00:36:03,359
nasa does and all the other things that

944
00:36:08,069 --> 00:36:05,920
the the half of one percent encompasses

945
00:36:09,750 --> 00:36:08,079
an awful lot of things one smaller piece

946
00:36:11,109 --> 00:36:09,760
of that is of which is the human

947
00:36:12,630 --> 00:36:11,119
spaceflight part

948
00:36:14,710 --> 00:36:12,640
but what we get out of that is we

949
00:36:17,190 --> 00:36:14,720
inspire the next generation you know

950
00:36:19,510 --> 00:36:17,200
people all over the world and and people

951
00:36:21,109 --> 00:36:19,520
in our schools here in the united states

952
00:36:23,030 --> 00:36:21,119
see these kinds of things and it gets

953
00:36:24,870 --> 00:36:23,040
them excited about doing this in their

954
00:36:26,310 --> 00:36:24,880
future and i think that's a that's a

955
00:36:28,150 --> 00:36:26,320
really important legacy and maybe it's

956
00:36:29,030 --> 00:36:28,160
one of the biggest paybacks that nasa

957
00:36:30,230 --> 00:36:29,040
gets

958
00:36:31,750 --> 00:36:30,240
so

959
00:36:33,670 --> 00:36:31,760
on the one hand again it's a little bit

960
00:36:36,069 --> 00:36:33,680
sad on the other uh there's an awful lot

961
00:36:40,950 --> 00:36:36,079
of opportunity right now and uh and i am

962
00:36:45,589 --> 00:36:43,990
um todd halberson of florida today for

963
00:36:48,230 --> 00:36:45,599

uh one or

964
00:36:50,870 --> 00:36:48,240
both of the cosmonauts i'm i'm wondering

965
00:36:52,950 --> 00:36:50,880
what your thoughts are on the retirement

966
00:36:55,430 --> 00:36:52,960
of the space shuttle fleet

967
00:36:58,390 --> 00:36:55,440
at this time in the life of the

968
00:36:59,589 --> 00:36:58,400
international space station and and your

969
00:37:02,950 --> 00:36:59,599
thoughts on

970
00:37:06,950 --> 00:37:02,960
the fact that the partnership will be

971
00:37:09,270 --> 00:37:06,960
relying on a single vehicle to get up

972
00:37:10,710 --> 00:37:09,280
and down the station for

973
00:37:18,950 --> 00:37:10,720
the

974
00:37:18,960 --> 00:38:16,870
so much

975
00:38:16,880 --> 00:38:34,069
uh

976
00:38:39,030 --> 00:38:36,390
i'd like to say that the spatial program

977
00:38:41,349 --> 00:38:39,040
was a huge and a tremendous program that

978
00:38:43,109 --> 00:38:41,359
made a great impact onto the process of

979
00:38:44,870 --> 00:38:43,119
discovering space

980
00:38:47,270 --> 00:38:44,880
and as a professionals we understand

981
00:38:48,069 --> 00:38:47,280
that the retirement of the space shuttle

982
00:38:53,109 --> 00:38:48,079
was

983
00:38:54,950 --> 00:38:53,119
uh from my own perspective i'm real

984
00:38:58,150 --> 00:38:54,960
disappointed that i would not be able to

985
00:39:01,349 --> 00:38:58,160
see the shuttle docked to the station

986
00:39:04,390 --> 00:39:01,359
but the program is going on however and

987
00:39:06,710 --> 00:39:04,400
new spaceships will replace the old ones

988
00:39:09,190 --> 00:39:06,720

and i'd like to remind everybody that uh

989
00:39:11,349 --> 00:39:09,200
from the point of talking of the nurse

990
00:39:14,390 --> 00:39:11,359
space station and the shuttle

991
00:39:16,310 --> 00:39:14,400
the uh program of cooperation between

992
00:39:19,190 --> 00:39:16,320
russia and nasa began

993
00:39:20,790 --> 00:39:19,200
and then it was carried on by russia

994
00:39:23,589 --> 00:39:20,800
nasa and all the other international

995
00:39:26,069 --> 00:39:23,599
partners so the shuttle and the murray

996
00:39:28,470 --> 00:39:26,079
station became the grounding stone in

997
00:39:30,710 --> 00:39:28,480
the future discovery of space

998
00:39:32,470 --> 00:39:30,720
and in the future

999
00:39:34,550 --> 00:39:32,480
startup of the new

1000
00:39:36,390 --> 00:39:34,560
our present iss international space

1001
00:39:37,670 --> 00:39:36,400
station

1002
00:39:39,430 --> 00:39:37,680
i knew that

1003
00:39:41,589 --> 00:39:39,440
sts-135

1004
00:39:44,390 --> 00:39:41,599
launch was planned

1005
00:39:47,589 --> 00:39:44,400
before our arrival to this station

1006
00:39:50,310 --> 00:39:47,599
but i hoped that because

1007
00:39:52,950 --> 00:39:50,320
we have a practice the shuttle launches

1008
00:39:56,310 --> 00:39:52,960
are quite often shifted to the right

1009
00:39:57,829 --> 00:39:56,320
i hope that it will happen unfortunately

1010
00:39:58,790 --> 00:39:57,839
it never happened

1011
00:40:01,750 --> 00:39:58,800
and

1012
00:40:04,950 --> 00:40:01,760
we will not have such an opportunity to

1013
00:40:07,670 --> 00:40:04,960

to go inside shuttle on orbit and i'm

1014
00:40:10,950 --> 00:40:07,680
really excited about it

1015
00:40:13,670 --> 00:40:10,960
but looking forward i think that new

1016
00:40:16,790 --> 00:40:13,680
commercial vehicles

1017
00:40:18,069 --> 00:40:16,800
from orbital and uh

1018
00:40:20,470 --> 00:40:18,079
orbital

1019
00:40:23,990 --> 00:40:20,480
and sagnas

1020
00:40:26,950 --> 00:40:24,000
will be able to provide station with all

1021
00:40:31,430 --> 00:40:26,960
the necessary stuff

1022
00:40:34,790 --> 00:40:32,950
all right thank you and now we'll be

1023
00:40:36,230 --> 00:40:34,800
switching over to a couple of questions

1024
00:40:41,190 --> 00:40:36,240
via our phone bridge first we have

1025
00:40:44,470 --> 00:40:43,589
hi thanks um a question for dan burbank

1026
00:40:46,470 --> 00:40:44,480
um

1027
00:40:48,790 --> 00:40:46,480
as has been mentioned before if the

1028
00:40:50,309 --> 00:40:48,800
timelines stay the same your crewmates

1029
00:40:52,069 --> 00:40:50,319
and you will be present on the

1030
00:40:54,390 --> 00:40:52,079
playstation for the test flights of both

1031
00:40:55,750 --> 00:40:54,400
spacex and orbital um could you

1032
00:40:57,349 --> 00:40:55,760
characterize the significance of those

1033
00:40:58,870 --> 00:40:57,359
milestones and also how important they

1034
00:41:01,109 --> 00:40:58,880
are for the future operations of the

1035
00:41:03,190 --> 00:41:01,119
space station okay i missed the very end

1036
00:41:06,950 --> 00:41:03,200
of that uh characterize the significance

1037
00:41:08,790 --> 00:41:06,960
of and i missed that one word

1038
00:41:12,470 --> 00:41:08,800

for the future operations of the space

1039
00:41:14,069 --> 00:41:12,480
station okay yes um

1040
00:41:17,750 --> 00:41:14,079
getting logistics of space station is

1041
00:41:18,790 --> 00:41:17,760
crucial i mean um and let me just

1042
00:41:23,750 --> 00:41:18,800
at the

1043
00:41:27,430 --> 00:41:23,760
leaving low earth orbit and getting to

1044
00:41:29,349 --> 00:41:27,440
17 500 miles at 400 kilometers uh

1045
00:41:32,390 --> 00:41:29,359
getting to that speed at those altitudes

1046
00:41:34,870 --> 00:41:32,400
is really hard it takes us about 20 to

1047
00:41:37,349 --> 00:41:34,880
even 25 pounds of

1048
00:41:39,910 --> 00:41:37,359
propellant high explosive propellant

1049
00:41:41,349 --> 00:41:39,920
engines and tanks to hold the propellant

1050
00:41:43,109 --> 00:41:41,359
for every useful pound that goes to

1051
00:41:45,349 --> 00:41:43,119
space station

1052
00:41:47,990 --> 00:41:45,359
so what that means is

1053
00:41:50,150 --> 00:41:48,000
your clothes your food your equipment

1054
00:41:53,349 --> 00:41:50,160
every the air and every breath that you

1055
00:41:55,750 --> 00:41:53,359
take the water you drink all of that

1056
00:41:57,750 --> 00:41:55,760
if we weren't able to

1057
00:42:00,550 --> 00:41:57,760
reuse as much as possible all that would

1058
00:42:01,990 --> 00:42:00,560
have to be resupplied at great expense

1059
00:42:03,910 --> 00:42:02,000
there's a lot of work being done on

1060
00:42:06,309 --> 00:42:03,920
space station right now to close the

1061
00:42:08,150 --> 00:42:06,319
life support loop to basically you know

1062
00:42:09,670 --> 00:42:08,160
we have a urine processor and a water

1063
00:42:12,790 --> 00:42:09,680

processor though the job of those two

1064
00:42:13,829 --> 00:42:12,800
pieces of equipment is to basically take

1065
00:42:17,349 --> 00:42:13,839
um

1066
00:42:19,750 --> 00:42:17,359
take urine from the you know we we drink

1067
00:42:21,270 --> 00:42:19,760
we uh we metabolize products and we

1068
00:42:23,109 --> 00:42:21,280
generate urine but to take that and

1069
00:42:25,030 --> 00:42:23,119
convert it into ultra pure water and

1070
00:42:27,829 --> 00:42:25,040
then the water we can drink the water we

1071
00:42:29,510 --> 00:42:27,839
can also split that molecule into oxygen

1072
00:42:31,109 --> 00:42:29,520
to breathe and we can

1073
00:42:33,510 --> 00:42:31,119
and then the hydrogen we typically would

1074
00:42:35,430 --> 00:42:33,520
pour it overboard we inhale and

1075
00:42:37,910 --> 00:42:35,440
metabolize the oxygen and we generate

1076
00:42:39,589 --> 00:42:37,920
carbon dioxide and we historically have

1077
00:42:40,790 --> 00:42:39,599
taken the carbon dioxide and scrubbed it

1078
00:42:42,150 --> 00:42:40,800
out of the atmosphere and thrown it

1079
00:42:45,030 --> 00:42:42,160
overboard

1080
00:42:47,589 --> 00:42:45,040
so all of those two the the hydrogen the

1081
00:42:49,589 --> 00:42:47,599
oxygen the co2 that we lose overboard

1082
00:42:50,950 --> 00:42:49,599
we're now able to replenish so with the

1083
00:42:53,030 --> 00:42:50,960
regenerative

1084
00:42:55,349 --> 00:42:53,040
environmental control system we have a

1085
00:42:57,670 --> 00:42:55,359
way to basically take the co2 that we

1086
00:42:59,430 --> 00:42:57,680
breathe now the excess and take some of

1087
00:43:01,750 --> 00:42:59,440
that hydrogen that otherwise we're

1088
00:43:03,430 --> 00:43:01,760

getting rid of combine the two and make

1089
00:43:05,510 --> 00:43:03,440
some more water to feed back into the

1090
00:43:07,910 --> 00:43:05,520
loop and reclaim a whole bunch of mass

1091
00:43:09,829 --> 00:43:07,920
that otherwise would be lost and

1092
00:43:11,910 --> 00:43:09,839
it also makes methane and the methane

1093
00:43:13,589 --> 00:43:11,920
you could also use we that actually goes

1094
00:43:15,829 --> 00:43:13,599
overboard but that's fuel if you were

1095
00:43:17,990 --> 00:43:15,839
doing this technology

1096
00:43:20,550 --> 00:43:18,000
on the moon or more likely on mars for

1097
00:43:21,829 --> 00:43:20,560
example you would basically recycle all

1098
00:43:23,190 --> 00:43:21,839
of those things and you would make a

1099
00:43:25,589 --> 00:43:23,200
little bit of methane that would power

1100
00:43:28,230 --> 00:43:25,599
your rovers or basically fuel your

1101
00:43:29,750 --> 00:43:28,240
ascent stage for example

1102
00:43:31,030 --> 00:43:29,760
we're we're not perfect at all that

1103
00:43:32,630 --> 00:43:31,040
we're just learning how to do that

1104
00:43:35,190 --> 00:43:32,640
there's a lot of good technology that's

1105
00:43:37,270 --> 00:43:35,200
in that particular

1106
00:43:38,950 --> 00:43:37,280
set of suite of equipment one of which

1107
00:43:41,349 --> 00:43:38,960
is the water purification beds we're

1108
00:43:43,270 --> 00:43:41,359
actually using that same technology in

1109
00:43:44,390 --> 00:43:43,280
third world countries and disaster areas

1110
00:43:46,630 --> 00:43:44,400
and so forth it has a lot of

1111
00:43:49,430 --> 00:43:46,640
applicability on planet earth but it

1112
00:43:50,790 --> 00:43:49,440
solves our problem on space station also

1113
00:43:53,270 --> 00:43:50,800

but it's not complete we're not

1114
00:43:55,349 --> 00:43:53,280
completely successful we do lose some so

1115
00:43:58,150 --> 00:43:55,359
no matter what we need to have a

1116
00:43:59,829 --> 00:43:58,160
logistic stream to basically return

1117
00:44:02,550 --> 00:43:59,839
things that we lose to basically

1118
00:44:04,630 --> 00:44:02,560
resupply space station and

1119
00:44:05,910 --> 00:44:04,640
and those in that capability which is

1120
00:44:07,589 --> 00:44:05,920
crucial

1121
00:44:09,109 --> 00:44:07,599
is being supplied in the future it's

1122
00:44:11,430 --> 00:44:09,119
always been for a long time now with the

1123
00:44:13,589 --> 00:44:11,440
progress russian progress cargo vehicles

1124
00:44:14,950 --> 00:44:13,599
with the hdv the hope transfer vehicle

1125
00:44:16,550 --> 00:44:14,960
that the japanese produce with the

1126
00:44:18,790 --> 00:44:16,560
automated transfer vehicle which the

1127
00:44:21,109 --> 00:44:18,800
europeans produce and now we're

1128
00:44:23,190 --> 00:44:21,119
replacing essentially the shuttles piece

1129
00:44:24,790 --> 00:44:23,200
with these commercial vehicles from the

1130
00:44:25,750 --> 00:44:24,800
from the u.s

1131
00:44:27,990 --> 00:44:25,760
we're going to get better we're going to

1132
00:44:29,990 --> 00:44:28,000
get better at re recycling the materials

1133
00:44:31,510 --> 00:44:30,000
we have on station but that's we're not

1134
00:44:32,950 --> 00:44:31,520
going to ever close it completely and

1135
00:44:35,910 --> 00:44:32,960
we're always going to need to get spare

1136
00:44:37,510 --> 00:44:35,920
parts up and and that capability is

1137
00:44:39,670 --> 00:44:37,520
crucial and it's capability it's not

1138
00:44:41,670 --> 00:44:39,680

just crucial for space station i think

1139
00:44:44,710 --> 00:44:41,680
it's crucial for

1140
00:44:46,150 --> 00:44:44,720
america to support a space-based economy

1141
00:44:47,750 --> 00:44:46,160
or a piece of our economy that's space

1142
00:44:49,349 --> 00:44:47,760
based in the future that

1143
00:44:52,390 --> 00:44:49,359
includes a space station but other

1144
00:44:59,430 --> 00:44:54,309
our next question is from anita king

1145
00:45:04,390 --> 00:45:01,829
yes a question for dan

1146
00:45:06,550 --> 00:45:04,400
was the end of the space station sorry

1147
00:45:08,150 --> 00:45:06,560
the space shuttle program do you think

1148
00:45:10,790 --> 00:45:08,160
the american

1149
00:45:13,349 --> 00:45:10,800
community is thinking that international

1150
00:45:16,150 --> 00:45:13,359
cooperation is now much more of an

1151
00:45:18,550 --> 00:45:16,160
important feature for international

1152
00:45:20,950 --> 00:45:18,560
space exploration and how can you

1153
00:45:23,589 --> 00:45:20,960
encourage that understanding especially

1154
00:45:25,829 --> 00:45:23,599
among young people here in this country

1155
00:45:28,150 --> 00:45:25,839
and a quick question for anton or

1156
00:45:30,550 --> 00:45:28,160
anatoly what is it about space

1157
00:45:32,710 --> 00:45:30,560
exploration that seems to be

1158
00:45:34,950 --> 00:45:32,720
desirable among young people and

1159
00:45:38,870 --> 00:45:34,960
transcends cultures and nationalities if

1160
00:45:43,510 --> 00:45:40,470
okay

1161
00:45:44,950 --> 00:45:43,520
i guess the first part there i think

1162
00:45:46,470 --> 00:45:44,960
i think in general

1163
00:45:48,630 --> 00:45:46,480

you know one of the difficult things

1164
00:45:50,150 --> 00:45:48,640
about this is the people that for you

1165
00:45:51,670 --> 00:45:50,160
know a significant portion of the people

1166
00:45:53,270 --> 00:45:51,680
that fly in space right now are not

1167
00:45:55,750 --> 00:45:53,280
necessarily the people that are

1168
00:45:57,589 --> 00:45:55,760
especially good at talking about it

1169
00:45:59,829 --> 00:45:57,599
we're we're operators we're engineers

1170
00:46:01,589 --> 00:45:59,839
we're scientists

1171
00:46:03,190 --> 00:46:01,599
but i think it's a very very important

1172
00:46:05,190 --> 00:46:03,200
thing

1173
00:46:06,710 --> 00:46:05,200
that we dedicated enough time while

1174
00:46:08,390 --> 00:46:06,720
we're up there to basically tell the

1175
00:46:09,589 --> 00:46:08,400
story of space exploration i mean it's

1176
00:46:11,510 --> 00:46:09,599
exciting there's there's a there's

1177
00:46:13,670 --> 00:46:11,520
plenty of people all around the world

1178
00:46:15,910 --> 00:46:13,680
that are lifelong converts and and you

1179
00:46:17,430 --> 00:46:15,920
don't have to sell the story to them but

1180
00:46:18,710 --> 00:46:17,440
but for other folks it's important to

1181
00:46:22,150 --> 00:46:18,720
understand that the things you do on

1182
00:46:24,630 --> 00:46:22,160
space station help life on earth

1183
00:46:26,870 --> 00:46:24,640
for kids it's important to convince them

1184
00:46:29,430 --> 00:46:26,880
that science technology engineering and

1185
00:46:31,190 --> 00:46:29,440
math are good things to do they're fun

1186
00:46:33,589 --> 00:46:31,200
they're interesting but they are

1187
00:46:35,349 --> 00:46:33,599
investments in our future

1188
00:46:36,470 --> 00:46:35,359

so whereas we'll be very busy and

1189
00:46:37,510 --> 00:46:36,480
there'll be a lot of work to do on

1190
00:46:39,030 --> 00:46:37,520
station

1191
00:46:40,870 --> 00:46:39,040
i think we'll also have plenty of time

1192
00:46:42,870 --> 00:46:40,880
to do educational kinds of events and

1193
00:46:44,790 --> 00:46:42,880
try to come up with compelling ways to

1194
00:46:45,670 --> 00:46:44,800
get that story out

1195
00:46:47,510 --> 00:46:45,680
but

1196
00:46:50,309 --> 00:46:47,520
i i guess

1197
00:46:51,910 --> 00:46:50,319
i think to me as one of the believers

1198
00:46:52,950 --> 00:46:51,920
you know lifelong believers in this

1199
00:46:54,150 --> 00:46:52,960
business

1200
00:46:56,630 --> 00:46:54,160
it

1201
00:46:58,710 --> 00:46:56,640
understand why people wouldn't get all

1202
00:47:00,790 --> 00:46:58,720
fired up about it because

1203
00:47:03,030 --> 00:47:00,800
it's fun it is interesting it's our

1204
00:47:05,670 --> 00:47:03,040
future i believe passionately that

1205
00:47:08,309 --> 00:47:05,680
humans are going to not just live on

1206
00:47:09,750 --> 00:47:08,319
planet earth for the indefinite future

1207
00:47:12,150 --> 00:47:09,760
you know it's our destiny to do these

1208
00:47:13,910 --> 00:47:12,160
kinds of things it makes us better it up

1209
00:47:15,990 --> 00:47:13,920
it lifts us up

1210
00:48:28,710 --> 00:47:16,000
we need the kinds of frontiers that

1211
00:48:33,349 --> 00:48:30,710
well we all know that

1212
00:48:35,430 --> 00:48:33,359
this present year has been called the

1213
00:48:37,670 --> 00:48:35,440

international year of space exploration

1214
00:48:39,910 --> 00:48:37,680
it all started 50 years ago with the

1215
00:48:41,109 --> 00:48:39,920
first flight of a human being of yuri

1216
00:48:44,390 --> 00:48:41,119
gagarin

1217
00:48:46,150 --> 00:48:44,400
and we can all see that the interest for

1218
00:48:49,430 --> 00:48:46,160
space for space science for space

1219
00:48:50,870 --> 00:48:49,440
exploration is growing as cosmos we make

1220
00:48:53,349 --> 00:48:50,880
presentations

1221
00:48:55,670 --> 00:48:53,359
also to children to youth and we can

1222
00:48:58,870 --> 00:48:55,680
hear that their questions that they ask

1223
00:49:01,670 --> 00:48:58,880
us are not those of children of or of

1224
00:49:03,750 --> 00:49:01,680
ignorant people they do not ask us how

1225
00:49:05,750 --> 00:49:03,760
we sleep in space or how we eat their

1226
00:49:08,710 --> 00:49:05,760
questions are more of a technical side

1227
00:49:10,710 --> 00:49:08,720
and probably the reasons for that are

1228
00:49:13,190 --> 00:49:10,720
maybe science fiction books or science

1229
00:49:15,589 --> 00:49:13,200
fiction movies or stuff like that and

1230
00:49:18,309 --> 00:49:15,599
it's always a pleasure to talk to them

1231
00:49:20,710 --> 00:49:18,319
we also tell them about how we became

1232
00:49:23,109 --> 00:49:20,720
cosmonauts how we became part of the

1233
00:49:25,510 --> 00:49:23,119
cosmonaut corps and we said that it's

1234
00:49:26,870 --> 00:49:25,520
not only that it's uh not really

1235
00:49:28,790 --> 00:49:26,880
necessary to be a military power to

1236
00:49:30,630 --> 00:49:28,800
become a course not you can come to the

1237
00:49:33,589 --> 00:49:30,640
cosmonaut court from many other fields

1238
00:49:35,990 --> 00:49:33,599

and many other professions

1239
00:49:39,030 --> 00:49:36,000
on orbit we will take part in

1240
00:49:42,150 --> 00:49:39,040
a conversation with students of

1241
00:49:43,750 --> 00:49:42,160
school students using hem radio

1242
00:49:46,150 --> 00:49:43,760
and we are going to

1243
00:49:48,549 --> 00:49:46,160
answer the equations there is also

1244
00:49:51,430 --> 00:49:48,559
ability for us to send

1245
00:49:55,030 --> 00:49:51,440
them pictures which they can

1246
00:49:56,630 --> 00:49:55,040
receive using ham radio technologies

1247
00:50:00,230 --> 00:49:56,640
and

1248
00:50:03,109 --> 00:50:00,240
it's it's of course it's important to

1249
00:50:03,910 --> 00:50:03,119
uh to help to understand young people

1250
00:50:04,790 --> 00:50:03,920
uh

1251
00:50:07,190 --> 00:50:04,800
that

1252
00:50:08,069 --> 00:50:07,200
they should work hard because

1253
00:50:10,870 --> 00:50:08,079
uh

1254
00:50:14,069 --> 00:50:10,880
their success in studies is their ticket

1255
00:50:18,150 --> 00:50:14,079
to the future as well we are going to

1256
00:50:19,270 --> 00:50:18,160
conduct a series of experiments

1257
00:50:20,790 --> 00:50:19,280
which

1258
00:50:23,430 --> 00:50:20,800
like

1259
00:50:25,510 --> 00:50:23,440
micro satellites which

1260
00:50:27,190 --> 00:50:25,520
has been done by

1261
00:50:31,190 --> 00:50:27,200
college students

1262
00:50:35,430 --> 00:50:31,200
and our mission is just to

1263
00:50:38,309 --> 00:50:36,390

all right

1264
00:50:40,630 --> 00:50:38,319
with that we will wrap up our briefing

1265
00:50:43,030 --> 00:50:40,640
thank you dan anton and anatoly and

1266
00:50:45,349 --> 00:50:43,040
thank you all for joining us

1267
00:50:47,190 --> 00:50:45,359
a reminder we will be having live

1268
00:50:49,750 --> 00:50:47,200
television interviews with dan burbank