
РОСКОСМОС
ROSCOSMOS
ЦНИИМАШ
TSNIIMASH
ЦЕНТР УПРАВЛЕНИЯ ПОЛЁТАМИ
КРИКАЛЁВ
Сергей Константинович

1
00:00:04,999 --> 00:00:03,080
good morning everybody from the Johnson

2
00:00:06,650 --> 00:00:05,009
Space Center in Houston I'm NASA's Josh

3
00:00:08,270 --> 00:00:06,660
Byerly we want to welcome you to today's

4
00:00:10,790 --> 00:00:08,280
briefing we're going to be taking a look

5
00:00:12,860 --> 00:00:10,800
at the one-year crew scott kelly and

6
00:00:14,209 --> 00:00:12,870
mikhail kornienko will be spending one

7
00:00:15,620 --> 00:00:14,219
year up on board the International Space

8
00:00:17,930 --> 00:00:15,630
Station and this will be the longest

9
00:00:20,179 --> 00:00:17,940
time that an expedition has taken place

10
00:00:21,529 --> 00:00:20,189
aboard this orbiting complex here to

11
00:00:23,330 --> 00:00:21,539
give us more details about what's ahead

12
00:00:25,009 --> 00:00:23,340
for the crew and the science that we

13
00:00:27,740 --> 00:00:25,019

hope to learn is an entire international

14
00:00:29,210 --> 00:00:27,750
panel to my left is Mike suffer Dini the

15
00:00:31,730 --> 00:00:29,220
International Space Station program

16
00:00:33,080 --> 00:00:31,740
manager as well as Julie Robinson the

17
00:00:36,110 --> 00:00:33,090
International Space Station program

18
00:00:38,569 --> 00:00:36,120
scientist as well as Bob Behnken NASA's

19
00:00:41,420 --> 00:00:38,579
chief astronaut we're also pleased to be

20
00:00:44,360 --> 00:00:41,430
joined from Moscow by our Rose cosmos

21
00:00:46,250 --> 00:00:44,370
colleagues including Alex a krasnov the

22
00:00:48,440 --> 00:00:46,260
director of piloted space programs

23
00:00:50,510 --> 00:00:48,450
Department for Rose cosmos as well as

24
00:00:52,549 --> 00:00:50,520
Sergei krikalev the director of the

25
00:00:55,880 --> 00:00:52,559
Gagarin cosmonaut training center as

26
00:00:58,880 --> 00:00:55,890
well as Igor Yakov the director of the

27
00:01:00,439 --> 00:00:58,890
Institute for biomedical problems we're

28
00:01:03,770 --> 00:01:00,449
going to start here in Houston with mr.

29
00:01:06,200 --> 00:01:03,780
siffredi knee well good morning as we

30
00:01:07,850 --> 00:01:06,210
have said for many years as we were

31
00:01:11,870 --> 00:01:07,860
building the International Space Station

32
00:01:16,010 --> 00:01:11,880
it plays many roles it has a very large

33
00:01:19,550 --> 00:01:16,020
benefit to humanity in general but also

34
00:01:22,789 --> 00:01:19,560
it it's utilized and will be utilized to

35
00:01:26,090 --> 00:01:22,799
advance human exploration beyond low

36
00:01:28,670 --> 00:01:26,100
Earth orbit when we think about it in

37
00:01:32,600 --> 00:01:28,680
terms of what the ISS provides to us we

38
00:01:35,240 --> 00:01:32,610

think about it in four major areas the

39
00:01:38,120 --> 00:01:35,250
first is technology development there

40
00:01:41,870 --> 00:01:38,130
are there are systems that we would like

41
00:01:43,999 --> 00:01:41,880
to develop to allow us to explore in

42
00:01:46,880 --> 00:01:44,009
long duration with long duration space

43
00:01:48,260 --> 00:01:46,890
travel some of those technologies are

44
00:01:50,899 --> 00:01:48,270
best tested in the microgravity

45
00:01:54,260 --> 00:01:50,909
environment of the International Space

46
00:01:57,670 --> 00:01:54,270
Station so that's one area another area

47
00:02:00,020 --> 00:01:57,680
that we look towards is system

48
00:02:01,940 --> 00:02:00,030
reliability testing and so there are

49
00:02:05,030 --> 00:02:01,950
many systems particularly fluid related

50
00:02:08,389 --> 00:02:05,040
systems that are not that we're not able

51
00:02:09,979 --> 00:02:08,399
to test as well on on the ground and so

52
00:02:12,470 --> 00:02:09,989
it would benefit us if we could get

53
00:02:13,650 --> 00:02:12,480
runtime on those systems in low-earth

54
00:02:16,140 --> 00:02:13,660
orbit

55
00:02:18,870 --> 00:02:16,150
prior to relying on them for long

56
00:02:22,140 --> 00:02:18,880
duration travel of course one of the

57
00:02:24,390 --> 00:02:22,150
most obvious is the human aspect of it

58
00:02:29,190 --> 00:02:24,400
the human body the human system and its

59
00:02:30,870 --> 00:02:29,200
ability to adapt and and to the

60
00:02:33,660 --> 00:02:30,880
microgravity environment and remain

61
00:02:36,000 --> 00:02:33,670
healthy not only for the trip but to be

62
00:02:38,100 --> 00:02:36,010
able to do the task required of the crew

63
00:02:39,930 --> 00:02:38,110

members once they reach their

64
00:02:42,240 --> 00:02:39,940
destination whatever that may be and

65
00:02:45,480 --> 00:02:42,250
then of course to return and and be

66
00:02:47,580 --> 00:02:45,490
healthy upon their return so that's a

67
00:02:49,470 --> 00:02:47,590
big aspect that's that we're all

68
00:02:51,870 --> 00:02:49,480
familiar with and then the last one is

69
00:02:54,300 --> 00:02:51,880
the operational in simulation and

70
00:02:56,760 --> 00:02:54,310
benefits of using a platform like the

71
00:03:00,420 --> 00:02:56,770
International Space Station to simulate

72
00:03:06,420 --> 00:03:00,430
the operations that we would do during a

73
00:03:08,940 --> 00:03:06,430
transit to to a distant location and and

74
00:03:12,170 --> 00:03:08,950
of course the ISS platform is is

75
00:03:16,590 --> 00:03:12,180
perfectly suited for that aspect as well

76
00:03:20,220 --> 00:03:16,600
so we have we have over the few last few

77
00:03:24,900 --> 00:03:20,230
years been slowly advancing in these

78
00:03:27,680 --> 00:03:24,910
areas on ISS we have have been testing

79
00:03:31,140 --> 00:03:27,690
some technologies on ISS particularly

80
00:03:32,850 --> 00:03:31,150
testing materials outside the ISS and

81
00:03:35,040 --> 00:03:32,860
you've seen some system testing we've

82
00:03:37,980 --> 00:03:35,050
done Robonaut is probably one of the

83
00:03:39,930 --> 00:03:37,990
most famous of the technologies we've

84
00:03:42,690 --> 00:03:39,940
been testing that have application for

85
00:03:46,350 --> 00:03:42,700
robotic operations we have also been

86
00:03:48,870 --> 00:03:46,360
testing some some systems that may be

87
00:03:50,820 --> 00:03:48,880
utilized and can be utilized in the the

88
00:03:54,210 --> 00:03:50,830

longer duration space travel we have an

89
00:03:57,690 --> 00:03:54,220
amine swingbed co2 removal system as an

90
00:03:59,690 --> 00:03:57,700
example in that area as well and we have

91
00:04:03,449 --> 00:03:59,700
other systems that we're building today

92
00:04:05,250 --> 00:04:03,459
that we intend to fly on ISS and utilize

93
00:04:08,190 --> 00:04:05,260
that one of those is the exploration

94
00:04:11,420 --> 00:04:08,200
suit that has been in development for

95
00:04:14,820 --> 00:04:11,430
some time it is our hope to get that

96
00:04:17,370 --> 00:04:14,830
developed and and on ISS and operate on

97
00:04:19,800 --> 00:04:17,380
ISS long enough to have the reliability

98
00:04:23,190 --> 00:04:19,810
confidence we'd like to use it beyond

99
00:04:25,970 --> 00:04:23,200
low-earth orbit we have just recently

100
00:04:27,980 --> 00:04:25,980
began some

101
00:04:32,630 --> 00:04:27,990
work in the operations arena on board

102
00:04:34,100 --> 00:04:32,640
ISS where we try to build procedures

103
00:04:36,530 --> 00:04:34,110
that are more odd that are more

104
00:04:39,200 --> 00:04:36,540
automated or standalone many of our

105
00:04:41,390 --> 00:04:39,210
procedures assume that the the ground

106
00:04:42,680 --> 00:04:41,400
team is there to help the crew and so we

107
00:04:45,050 --> 00:04:42,690
tell the crew when they reach a certain

108
00:04:47,090 --> 00:04:45,060
step talk to the ground the ground will

109
00:04:49,160 --> 00:04:47,100
look at the data and give the crew an

110
00:04:51,620 --> 00:04:49,170
assessment and give them a go for the

111
00:04:54,260 --> 00:04:51,630
next step and so what we've slowly began

112
00:04:56,690 --> 00:04:54,270
to do is take some of those procedures

113
00:04:59,150 --> 00:04:56,700

and modify them so that the crew takes

114
00:05:00,800 --> 00:04:59,160
all the steps is this they're on a long

115
00:05:03,080 --> 00:05:00,810
trip and they don't have really close

116
00:05:06,920 --> 00:05:03,090
communications with the ground and and

117
00:05:08,480 --> 00:05:06,930
are able to communicate of course human

118
00:05:10,880 --> 00:05:08,490
adaptation has been something we've been

119
00:05:12,820 --> 00:05:10,890
doing for some time we have quite a bit

120
00:05:17,060 --> 00:05:12,830
of data and continue to retrieve data on

121
00:05:19,250 --> 00:05:17,070
the the survival of the human in the end

122
00:05:21,950 --> 00:05:19,260
being fit when you return after six

123
00:05:25,220 --> 00:05:21,960
month increment and it only makes sense

124
00:05:26,780 --> 00:05:25,230
that eventually we extend that to longer

125
00:05:29,720 --> 00:05:26,790
periods of time to ensure for those

126
00:05:34,820 --> 00:05:29,730
longer transit periods were able to us

127
00:05:37,940 --> 00:05:34,830
to survive and so from that that with

128
00:05:40,670 --> 00:05:37,950
that in mind the partnership got

129
00:05:44,480 --> 00:05:40,680
together and decided that it was time to

130
00:05:47,060 --> 00:05:44,490
consider a longer duration increment to

131
00:05:49,490 --> 00:05:47,070
get some initial data on on how the

132
00:05:50,870 --> 00:05:49,500
crews will acclimate of course our

133
00:05:53,690 --> 00:05:50,880
Russian colleagues have a little bit of

134
00:05:56,540 --> 00:05:53,700
experience in this area they have 44

135
00:05:59,210 --> 00:05:56,550
cases where they have over one year

136
00:06:00,800 --> 00:05:59,220
experience cruise or to one year to over

137
00:06:02,990 --> 00:06:00,810
one year experience and they have a

138
00:06:05,120 --> 00:06:03,000

number of cases actually where they've

139
00:06:07,550 --> 00:06:05,130
gone beyond six months maybe in the

140
00:06:10,700 --> 00:06:07,560
10-month arena so there's quite a bit of

141
00:06:13,280 --> 00:06:10,710
data but we have also evolved quite a

142
00:06:15,370 --> 00:06:13,290
bit in terms of our ability to mitigate

143
00:06:17,420 --> 00:06:15,380
the effects of the microgravity

144
00:06:18,980 --> 00:06:17,430
environment on the human body and it

145
00:06:21,920 --> 00:06:18,990
would begin it'd be good to start

146
00:06:25,850 --> 00:06:21,930
getting some data utilizing these newer

147
00:06:27,920 --> 00:06:25,860
techniques and so from that outgrowth

148
00:06:30,110 --> 00:06:27,930
came this idea to have the one year

149
00:06:33,800 --> 00:06:30,120
increment the first of what I expect

150
00:06:36,410 --> 00:06:33,810
will be several perhaps not immediately

151
00:06:38,810 --> 00:06:36,420
following this one but i would expect us

152
00:06:39,650 --> 00:06:38,820
to have several along the way but this

153
00:06:42,530 --> 00:06:39,660
first one would

154
00:06:46,250 --> 00:06:42,540
you will launch the crew will launch in

155
00:06:49,430 --> 00:06:46,260
the springtime of 2015 will allow us to

156
00:06:53,180 --> 00:06:49,440
get some early data on on what it's like

157
00:06:56,690 --> 00:06:53,190
for our cruise to be in orbit into one

158
00:06:58,160 --> 00:06:56,700
year time frame so with that that

159
00:07:00,530 --> 00:06:58,170
agreement with our partnerships we've

160
00:07:02,810 --> 00:07:00,540
announced the crew is Josh mentioned and

161
00:07:05,990 --> 00:07:02,820
we're proceeding down the path to train

162
00:07:09,830 --> 00:07:06,000
the crew and build an integrated test

163
00:07:12,710 --> 00:07:09,840

that that both crew will follow through

164
00:07:15,830 --> 00:07:12,720
the entire lifecycle pre-flight launch

165
00:07:17,420 --> 00:07:15,840
on orbit and return so that we're able

166
00:07:19,400 --> 00:07:17,430
to share the data between the entire

167
00:07:22,700 --> 00:07:19,410
partnership and gain the most from this

168
00:07:24,380 --> 00:07:22,710
this first step so with that that

169
00:07:25,850 --> 00:07:24,390
concludes my comments and I'll hand it

170
00:07:28,550 --> 00:07:25,860
to a Julie Robinson who will tell us

171
00:07:30,710 --> 00:07:28,560
more about the specifics thanks Mike

172
00:07:32,030 --> 00:07:30,720
we've been working really closely with

173
00:07:35,030 --> 00:07:32,040
our Russian colleagues especially

174
00:07:38,090 --> 00:07:35,040
professor used to Tov and in all of his

175
00:07:40,250 --> 00:07:38,100
colleagues at I MBP to define what that

176
00:07:42,050 --> 00:07:40,260
one year increment would be that work is

177
00:07:44,420 --> 00:07:42,060
still in progress so we can't tell you

178
00:07:46,100 --> 00:07:44,430
today exactly which experiments but I

179
00:07:47,900 --> 00:07:46,110
want to talk to you about the basis for

180
00:07:49,850 --> 00:07:47,910
thinking about which areas are going to

181
00:07:52,460 --> 00:07:49,860
be important and for what experiments we

182
00:07:56,690 --> 00:07:52,470
will be doing using this combined crew

183
00:07:58,909 --> 00:07:56,700
as subjects first I just want to mention

184
00:08:01,460 --> 00:07:58,919
that there really is a long experience

185
00:08:03,950 --> 00:08:01,470
as Mike said that our Russian colleagues

186
00:08:06,890 --> 00:08:03,960
have with long duration flight and I do

187
00:08:09,830 --> 00:08:06,900
have a graphic on that you can see that

188
00:08:11,180 --> 00:08:09,840

there are four Russians that have had

189
00:08:13,520 --> 00:08:11,190
the opportunity to fly more than 12

190
00:08:16,300 --> 00:08:13,530
months in space and two as well that

191
00:08:19,040 --> 00:08:16,310
have flown 10 or 11 months in space and

192
00:08:21,320 --> 00:08:19,050
but all of these crew members flew

193
00:08:22,280 --> 00:08:21,330
really during the early space fighters

194
00:08:23,870 --> 00:08:22,290
none of them have been to the

195
00:08:26,840 --> 00:08:23,880
International Space Station and in fact

196
00:08:28,730 --> 00:08:26,850
our most recent the most recent

197
00:08:32,390 --> 00:08:28,740
long-duration flight of humanity

198
00:08:33,709 --> 00:08:32,400
12-month flight was in 1999 and so a lot

199
00:08:35,300 --> 00:08:33,719
of things have changed since then all

200
00:08:36,650 --> 00:08:35,310
the lessons of mirror have been

201
00:08:38,839 --> 00:08:36,660
incorporated into the International

202
00:08:41,209 --> 00:08:38,849
Space Station and we've even moved on

203
00:08:43,130 --> 00:08:41,219
from our sort of International Space

204
00:08:44,900 --> 00:08:43,140
Station starting conditions in terms of

205
00:08:48,070 --> 00:08:44,910
how we maintain astronaut health and

206
00:08:51,500 --> 00:08:48,080
gone to sort of 2 point 0 if you will

207
00:08:53,330 --> 00:08:51,510
for the exercise hardware our exercise

208
00:08:55,730 --> 00:08:53,340
protocols our nutrition protocol

209
00:08:58,490 --> 00:08:55,740
also medical technologies have advanced

210
00:09:00,650 --> 00:08:58,500
significantly significantly since 1999

211
00:09:02,150 --> 00:09:00,660
and so it's a our Russian colleagues

212
00:09:04,460 --> 00:09:02,160
came to us and thought it was a good

213
00:09:06,650 --> 00:09:04,470

time to start looking at this originally

214
00:09:07,910 --> 00:09:06,660
on the NASA side i would say we had been

215
00:09:10,940 --> 00:09:07,920
thinking about waiting a little while

216
00:09:12,470 --> 00:09:10,950
and working on some of the the shorter

217
00:09:15,260 --> 00:09:12,480
duration meaning six month increments

218
00:09:16,790 --> 00:09:15,270
which isn't really short problems but as

219
00:09:20,150 --> 00:09:16,800
we talk to them about it we saw

220
00:09:21,980 --> 00:09:20,160
significant value in doing a sort of a

221
00:09:24,080 --> 00:09:21,990
spot check and so i want to show you a

222
00:09:26,420 --> 00:09:24,090
couple of very simple graphs that give

223
00:09:27,860 --> 00:09:26,430
you a sense of why that difference

224
00:09:30,170 --> 00:09:27,870
between six months and twelve months

225
00:09:31,910 --> 00:09:30,180
could be important so what you see here

226
00:09:33,560 --> 00:09:31,920
is sort of a representation of the

227
00:09:36,380 --> 00:09:33,570
effects of the human on the human body

228
00:09:38,360 --> 00:09:36,390
of being in space and right now today I

229
00:09:40,160 --> 00:09:38,370
would say we know a lot about zero to

230
00:09:41,450 --> 00:09:40,170
six months due to our experience on the

231
00:09:43,490 --> 00:09:41,460
International Space Station and

232
00:09:46,880 --> 00:09:43,500
depending on the system we're looking at

233
00:09:48,530 --> 00:09:46,890
you can have some things where the

234
00:09:50,870 --> 00:09:48,540
effect happens very early in spaceflight

235
00:09:53,660 --> 00:09:50,880
and then it sort of levels out and there

236
00:09:56,360 --> 00:09:53,670
isn't an ongoing concern you can also

237
00:09:58,160 --> 00:09:56,370
have cases where we think there's just a

238
00:09:59,630 --> 00:09:58,170

constant rate of impact and the longer

239
00:10:01,850 --> 00:09:59,640
you're there it's just a nice linear

240
00:10:03,920 --> 00:10:01,860
process and then there are certain risks

241
00:10:05,570 --> 00:10:03,930
or challenges to the human body that we

242
00:10:07,940 --> 00:10:05,580
know are there but we think that they're

243
00:10:12,500 --> 00:10:07,950
small enough that they're probably not a

244
00:10:13,910 --> 00:10:12,510
problem if you look at the graph on the

245
00:10:16,760 --> 00:10:13,920
right side you see a big question mark

246
00:10:20,630 --> 00:10:16,770
because we really don't understand with

247
00:10:23,840 --> 00:10:20,640
the same level of process what goes on

248
00:10:26,180 --> 00:10:23,850
after six to 12 months because measures

249
00:10:27,980 --> 00:10:26,190
were a lot different 20 years ago when

250
00:10:29,630 --> 00:10:27,990
the last twelve-month crew members flew

251
00:10:31,370 --> 00:10:29,640
even as we discuss these with our

252
00:10:33,650 --> 00:10:31,380
Russian colleagues so if I could have

253
00:10:35,570 --> 00:10:33,660
the next chart I'll show you some

254
00:10:38,540 --> 00:10:35,580
possibilities that we could discover for

255
00:10:40,610 --> 00:10:38,550
different systems so in that first blue

256
00:10:42,230 --> 00:10:40,620
line that early effect if things are the

257
00:10:44,090 --> 00:10:42,240
way we think they are we what we've

258
00:10:45,380 --> 00:10:44,100
learned in a 12-month increment is that

259
00:10:47,150 --> 00:10:45,390
we definitely don't have any other

260
00:10:49,070 --> 00:10:47,160
problems to worry about we can just

261
00:10:51,380 --> 00:10:49,080
focus on short duration studies to solve

262
00:10:54,230 --> 00:10:51,390
that problem if we have a constant rate

263
00:10:55,490 --> 00:10:54,240

then we know that that indeed problem is

264
00:10:57,140 --> 00:10:55,500
going to get bigger and bigger the

265
00:10:58,400 --> 00:10:57,150
longer we stay in orbit and that affects

266
00:11:01,040 --> 00:10:58,410
the way that we develop our

267
00:11:02,930 --> 00:11:01,050
countermeasures to the problem but

268
00:11:05,000 --> 00:11:02,940
what's really important if you look at

269
00:11:06,740 --> 00:11:05,010
that bottom line is that it's possible

270
00:11:08,540 --> 00:11:06,750
there are some things that we think

271
00:11:10,310 --> 00:11:08,550
are a constant low rate that we haven't

272
00:11:12,650 --> 00:11:10,320
identified as a problem and could have a

273
00:11:15,440 --> 00:11:12,660
late effect and if we identify that late

274
00:11:17,900 --> 00:11:15,450
effect in 9 to 12 month range that could

275
00:11:19,610 --> 00:11:17,910
become a significant risk for human

276
00:11:21,920 --> 00:11:19,620
space flight long-duration missions and

277
00:11:23,600 --> 00:11:21,930
we wouldn't be looking at it today at

278
00:11:24,950 --> 00:11:23,610
the same time it's also possible that's

279
00:11:27,020 --> 00:11:24,960
a low constant rate and it really never

280
00:11:30,110 --> 00:11:27,030
becomes a problem and so this kind of

281
00:11:31,550 --> 00:11:30,120
gives you in a try to make it a pretty

282
00:11:33,170 --> 00:11:31,560
simple form but it gives you a sense of

283
00:11:36,740 --> 00:11:33,180
what scientists have to think about as

284
00:11:38,180 --> 00:11:36,750
we go through the many dozens of risks

285
00:11:40,070 --> 00:11:38,190
that were looking at for human

286
00:11:41,150 --> 00:11:40,080
spaceflight and think about what

287
00:11:44,090 --> 00:11:41,160
experiments we would do in a

288
00:11:47,810 --> 00:11:44,100

long-duration mission so in working with

289
00:11:49,190 --> 00:11:47,820
our Russian colleagues to develop the

290
00:11:50,990 --> 00:11:49,200
science plan we've been having a lot of

291
00:11:52,460 --> 00:11:51,000
discussions of different systems and of

292
00:11:54,440 --> 00:11:52,470
course the key variable is to look at

293
00:11:57,290 --> 00:11:54,450
that time period and although two

294
00:11:59,420 --> 00:11:57,300
crewmembers doesn't amount to a complete

295
00:12:01,700 --> 00:11:59,430
study it does give us a sort of a spot

296
00:12:03,980 --> 00:12:01,710
check so if you see those graphs I just

297
00:12:05,960 --> 00:12:03,990
showed it will give us a sense of if a

298
00:12:07,550 --> 00:12:05,970
couple of crew members are up in the

299
00:12:09,320 --> 00:12:07,560
danger range on something that we've

300
00:12:11,870 --> 00:12:09,330
measured it tells us we need to redesign

301
00:12:14,030 --> 00:12:11,880
our programs we may need to look at more

302
00:12:16,490 --> 00:12:14,040
longer duration crew members by the same

303
00:12:18,320 --> 00:12:16,500
token if things match the patterns we

304
00:12:20,270 --> 00:12:18,330
understand it also gives us comfort in

305
00:12:22,430 --> 00:12:20,280
continuing with six month increments as

306
00:12:25,460 --> 00:12:22,440
our primary research focus so it's a

307
00:12:27,770 --> 00:12:25,470
very useful kind of a check for us so

308
00:12:29,870 --> 00:12:27,780
the studies that we'll be doing jointly

309
00:12:32,360 --> 00:12:29,880
with our Russian colleagues are going to

310
00:12:36,910 --> 00:12:32,370
be in we believe about seven different

311
00:12:39,440 --> 00:12:36,920
areas of focus and those studies will be

312
00:12:40,850 --> 00:12:39,450
jointly executed so that they're done on

313
00:12:43,100 --> 00:12:40,860

both crewmembers the same way and that

314
00:12:45,770 --> 00:12:43,110
allows us both to have efficiencies and

315
00:12:47,120 --> 00:12:45,780
to have a little bit of statistical

316
00:12:49,160 --> 00:12:47,130
variability and looking at those two

317
00:12:50,540 --> 00:12:49,170
crewmembers they'll be very similar to

318
00:12:52,550 --> 00:12:50,550
the studies that we're doing on the

319
00:12:54,800 --> 00:12:52,560
cruise right now which allows us to

320
00:12:56,840 --> 00:12:54,810
compare between the 12-month data points

321
00:12:59,480 --> 00:12:56,850
and the six-month data points and even

322
00:13:01,579 --> 00:12:59,490
will allow us to compare for Scott

323
00:13:03,140 --> 00:13:01,589
amisha data to their previous space

324
00:13:05,450 --> 00:13:03,150
flight experience and so that's also

325
00:13:06,680 --> 00:13:05,460
quite helpful the first one of the first

326
00:13:08,570 --> 00:13:06,690
areas that we're looking at of course

327
00:13:11,270 --> 00:13:08,580
are the vision impacts and intracranial

328
00:13:13,790 --> 00:13:11,280
pressure this is a new discovery that

329
00:13:15,380 --> 00:13:13,800
was made jointly over the last couple of

330
00:13:18,290 --> 00:13:15,390
years where we discovered that some crew

331
00:13:20,600 --> 00:13:18,300
members are having some pressure in

332
00:13:22,460 --> 00:13:20,610
there intracranial pressure pressure in

333
00:13:24,530 --> 00:13:22,470
or you know vain system in their brains

334
00:13:26,990 --> 00:13:24,540
and their spinal cords especially and

335
00:13:29,569 --> 00:13:27,000
that that was causing in some crew

336
00:13:30,889 --> 00:13:29,579
members a vision impact that could be

337
00:13:32,720 --> 00:13:30,899
permanent on the ground and so that's

338
00:13:35,810 --> 00:13:32,730

one area that we're very interested in

339
00:13:37,430 --> 00:13:35,820
understanding because it's so new other

340
00:13:38,810 --> 00:13:37,440
areas and I have just a couple of

341
00:13:40,040 --> 00:13:38,820
visuals to go with these because I'm

342
00:13:41,389 --> 00:13:40,050
just going to mention them in a very

343
00:13:43,610 --> 00:13:41,399
high level but you'll see pictures of

344
00:13:45,980 --> 00:13:43,620
crew members on orbit over the last few

345
00:13:48,170 --> 00:13:45,990
months doing activities related to these

346
00:13:50,360 --> 00:13:48,180
same kinds of experiments so the next

347
00:13:52,009 --> 00:13:50,370
area will be looking at is exercise

348
00:13:55,090 --> 00:13:52,019
nutrition and bone loss we've made

349
00:13:57,079 --> 00:13:55,100
significant accomplishments in

350
00:13:58,250 --> 00:13:57,089
protecting bone and crew members in a

351
00:14:00,170 --> 00:13:58,260
six-month mission and that's been a

352
00:14:02,389 --> 00:14:00,180
problem out there since the Gemini

353
00:14:04,940 --> 00:14:02,399
missions and we now know how to maintain

354
00:14:06,500 --> 00:14:04,950
crew bone in a six-month mission so it

355
00:14:08,750 --> 00:14:06,510
will be really nice to see how well

356
00:14:10,069 --> 00:14:08,760
those protocols perform in a 12-month

357
00:14:11,509 --> 00:14:10,079
mission and those of course weren't

358
00:14:13,790 --> 00:14:11,519
available back in those mere days so

359
00:14:15,800 --> 00:14:13,800
it's a very great check for us we'll

360
00:14:17,420 --> 00:14:15,810
also be looking at immune function

361
00:14:19,759 --> 00:14:17,430
that's something where we really don't

362
00:14:21,110 --> 00:14:19,769
understand the process and so looking at

363
00:14:24,079 --> 00:14:21,120

what that does over 12 months is

364
00:14:25,699 --> 00:14:24,089
important neuro vestibular affects the

365
00:14:27,650 --> 00:14:25,709
longer that you've adapted to being in

366
00:14:29,120 --> 00:14:27,660
spaceflight the more difficult you may

367
00:14:31,430 --> 00:14:29,130
more difficulty you may have been

368
00:14:34,009 --> 00:14:31,440
returning to earth and so we're having

369
00:14:36,079 --> 00:14:34,019
some great interchanges with our Russian

370
00:14:37,790 --> 00:14:36,089
colleagues about what are the right test

371
00:14:39,769 --> 00:14:37,800
to do especially post flight and the

372
00:14:42,500 --> 00:14:39,779
NASA side we typically do something

373
00:14:44,000 --> 00:14:42,510
called functional task test our Russian

374
00:14:45,319 --> 00:14:44,010
colleagues do something as well and

375
00:14:48,400 --> 00:14:45,329
we're looking at merging those together

376
00:14:51,319 --> 00:14:48,410
into a dynamic set of data collections

377
00:14:52,759 --> 00:14:51,329
another area where long duration may be

378
00:14:54,860 --> 00:14:52,769
significantly different than short

379
00:14:57,800 --> 00:14:54,870
duration is in behavior performance and

380
00:14:59,900 --> 00:14:57,810
crew interactions and so they'll be some

381
00:15:02,480 --> 00:14:59,910
work in that area in some investigations

382
00:15:04,610 --> 00:15:02,490
in that area and then radiation

383
00:15:05,750 --> 00:15:04,620
biomarkers is an important area because

384
00:15:08,000 --> 00:15:05,760
that's one of those straight linear

385
00:15:09,800 --> 00:15:08,010
processes the longer duration you're

386
00:15:11,630 --> 00:15:09,810
there the more radiation you're you're

387
00:15:14,060 --> 00:15:11,640
you're getting in a very linear fashion

388
00:15:16,250 --> 00:15:14,070

and so 12-month mission is an important

389
00:15:18,290 --> 00:15:16,260
one for looking at that we don't really

390
00:15:20,060 --> 00:15:18,300
do a lot of focus on radiation

391
00:15:21,769 --> 00:15:20,070
biomarkers and short duration missions

392
00:15:23,689 --> 00:15:21,779
because the accumulation is low enough

393
00:15:26,060 --> 00:15:23,699
that that we really think we know how to

394
00:15:28,329 --> 00:15:26,070
handle that pretty well and then finally

395
00:15:30,889 --> 00:15:28,339
we'll be looking at training approaches

396
00:15:32,329 --> 00:15:30,899
because one big difference between a

397
00:15:34,400 --> 00:15:32,339
six-month mission and a one-year mission

398
00:15:38,269 --> 00:15:34,410
and it's a difference that also happens

399
00:15:40,340 --> 00:15:38,279
on a Mars mission is that you have to

400
00:15:42,980 --> 00:15:40,350
train a long time before you do certain

401
00:15:44,960 --> 00:15:42,990
activities and so doing everything on

402
00:15:46,819 --> 00:15:44,970
the ground and then trying to remember

403
00:15:48,769 --> 00:15:46,829
that for until you need to know that

404
00:15:50,509 --> 00:15:48,779
information in orbit it's maybe not the

405
00:15:52,129 --> 00:15:50,519
best way to train and execute some of

406
00:15:54,350 --> 00:15:52,139
those missions and so we'll have some

407
00:15:56,300 --> 00:15:54,360
studies both of how we do operations and

408
00:15:59,840 --> 00:15:56,310
how we do training to help facilitate

409
00:16:02,090 --> 00:15:59,850
this mission so when we when we do these

410
00:16:03,949 --> 00:16:02,100
kinds of studies and we're really pretty

411
00:16:05,420 --> 00:16:03,959
excited about the final plan that we

412
00:16:08,389 --> 00:16:05,430
should have in place in the January

413
00:16:11,720 --> 00:16:08,399

timeframe as we put that final plan

414
00:16:13,879 --> 00:16:11,730
together I think both we n and I MVP are

415
00:16:16,369 --> 00:16:13,889
really conscious of the fact that as we

416
00:16:18,550 --> 00:16:16,379
make these applied discoveries and add

417
00:16:21,350 --> 00:16:18,560
more knowledge to our understanding of

418
00:16:23,090 --> 00:16:21,360
supporting the human body in space those

419
00:16:25,009 --> 00:16:23,100
do help us with our future space flight

420
00:16:26,540 --> 00:16:25,019
plans but they of course also give us

421
00:16:29,269 --> 00:16:26,550
information that comes right back down

422
00:16:30,769 --> 00:16:29,279
here on earth and so it's really a great

423
00:16:33,290 --> 00:16:30,779
opportunity for the space station

424
00:16:35,389 --> 00:16:33,300
program to get some early insight into

425
00:16:36,499 --> 00:16:35,399
12-month missions and what we need to do

426
00:16:39,439 --> 00:16:36,509
to get the most out of the space station

427
00:16:41,059 --> 00:16:39,449
both for our future exploration needs as

428
00:16:43,939 --> 00:16:41,069
well as for improving human health on

429
00:16:46,970 --> 00:16:43,949
earth and with that let me hand off to

430
00:16:48,920 --> 00:16:46,980
Bob Thank You Julie I think we've had a

431
00:16:50,960 --> 00:16:48,930
good outline of the use of the space

432
00:16:52,939 --> 00:16:50,970
station we've had a good outline of the

433
00:16:55,009 --> 00:16:52,949
science objectives that may be a part of

434
00:16:56,269 --> 00:16:55,019
the upcoming out one year flight but I

435
00:16:58,189 --> 00:16:56,279
wanted to share a little bit with you

436
00:17:00,259 --> 00:16:58,199
about the operational way that will go

437
00:17:02,179 --> 00:17:00,269
off and execute this our Russian

438
00:17:04,159 --> 00:17:02,189

colleagues may have some more detail to

439
00:17:06,860 --> 00:17:04,169
it but it did play into our our

440
00:17:09,439 --> 00:17:06,870
selection of the eventual crew that we

441
00:17:11,929 --> 00:17:09,449
we named to the one year flight this

442
00:17:13,579 --> 00:17:11,939
execution of a one-year mission requires

443
00:17:16,549 --> 00:17:13,589
us to do things a little bit differently

444
00:17:18,340 --> 00:17:16,559
than we normally do for Soyuz cruise so

445
00:17:21,460 --> 00:17:18,350
use crews are normally put together

446
00:17:23,840 --> 00:17:21,470
primarily trained as a three-person team

447
00:17:25,340 --> 00:17:23,850
launched into space and then return

448
00:17:27,829 --> 00:17:25,350
together as a part of that same

449
00:17:29,600 --> 00:17:27,839
three-person team they may overlap with

450
00:17:32,480 --> 00:17:29,610
some crews on orbit and have to be

451
00:17:34,630 --> 00:17:32,490
prepared to do emergency response it

452
00:17:37,850 --> 00:17:34,640
should that be required on board the ISS

453
00:17:39,890 --> 00:17:37,860
but they do maintain that core group of

454
00:17:42,260 --> 00:17:39,900
three individuals throughout most of

455
00:17:45,740 --> 00:17:42,270
their training for the one-year crew

456
00:17:46,880 --> 00:17:45,750
since the Soyuz is rotated out every six

457
00:17:49,250 --> 00:17:46,890
months they have a little

458
00:17:51,770 --> 00:17:49,260
but different training template training

459
00:17:53,690 --> 00:17:51,780
requirements they have a case where two

460
00:17:56,720 --> 00:17:53,700
of our crew members will launch on a

461
00:17:59,210 --> 00:17:56,730
Soyuz with the Soyuz commander and be a

462
00:18:01,880 --> 00:17:59,220
three-person unit just for the acent

463
00:18:05,210 --> 00:18:01,890

phase and then the beginning portion of

464
00:18:07,190 --> 00:18:05,220
their time onboard the ISS when the time

465
00:18:10,370 --> 00:18:07,200
comes six months later for that so used

466
00:18:11,930 --> 00:18:10,380
to be rotated out they'll wave goodbye

467
00:18:13,940 --> 00:18:11,940
to one of their crew members that

468
00:18:17,690 --> 00:18:13,950
they've shared so much time on orbit

469
00:18:20,210 --> 00:18:17,700
with and join a new crew if you will

470
00:18:23,750 --> 00:18:20,220
with a single new crew member while they

471
00:18:25,730 --> 00:18:23,760
remain onboard the ISS later six months

472
00:18:28,160 --> 00:18:25,740
after that at the 12-month point they'll

473
00:18:29,960 --> 00:18:28,170
return with that new Soyuz commander

474
00:18:31,370 --> 00:18:29,970
that arrived with them so that's a

475
00:18:33,890 --> 00:18:31,380
little bit different than the way we

476
00:18:36,230 --> 00:18:33,900
normally do business and that our crew

477
00:18:39,170 --> 00:18:36,240
for the one-year mission is actually a

478
00:18:41,570 --> 00:18:39,180
multiple crews they'll be executing

479
00:18:44,210 --> 00:18:41,580
their their training for acent with one

480
00:18:45,800 --> 00:18:44,220
Soyuz commander executing their training

481
00:18:48,770 --> 00:18:45,810
for entry with a different Soyuz

482
00:18:51,500 --> 00:18:48,780
commander on top of that they'll also be

483
00:18:53,860 --> 00:18:51,510
preparing for any onboard emergency

484
00:18:56,930 --> 00:18:53,870
response or to execute the mission

485
00:18:59,540 --> 00:18:56,940
normally that goes on on a daily basis

486
00:19:02,330 --> 00:18:59,550
onboard the ISS with several different

487
00:19:04,250 --> 00:19:02,340
groups of crew members based on the

488
00:19:05,900 --> 00:19:04,260

visiting vehicles that arrive and of

489
00:19:08,330 --> 00:19:05,910
course as I mentioned that rotation of

490
00:19:10,100 --> 00:19:08,340
that test soyuz commander so that's in

491
00:19:12,110 --> 00:19:10,110
and of itself drives our training

492
00:19:13,370 --> 00:19:12,120
template to be slightly different for

493
00:19:15,920 --> 00:19:13,380
our one year crew members then it's

494
00:19:17,780 --> 00:19:15,930
historically been for the six month six

495
00:19:19,190 --> 00:19:17,790
months days which is an interesting

496
00:19:20,720 --> 00:19:19,200
challenge and it's a new way of doing

497
00:19:24,260 --> 00:19:20,730
business which is I think part of the

498
00:19:26,930 --> 00:19:24,270
purpose of the our activities onboard

499
00:19:29,930 --> 00:19:26,940
the ISS to continue to explore new ways

500
00:19:32,120 --> 00:19:29,940
of executing the mission or doing things

501
00:19:34,340 --> 00:19:32,130
that are more analogous to what we would

502
00:19:37,640 --> 00:19:34,350
do in an exploration mission downstream

503
00:19:40,190 --> 00:19:37,650
other criteria in addition to this need

504
00:19:41,900 --> 00:19:40,200
to find a crew member who could fit in

505
00:19:44,750 --> 00:19:41,910
with several different crews and be

506
00:19:47,180 --> 00:19:44,760
successful at that we needed to select a

507
00:19:50,000 --> 00:19:47,190
space station commander at least on the

508
00:19:53,570 --> 00:19:50,010
US side the person that we eventually

509
00:19:55,370 --> 00:19:53,580
selected will be required to execute as

510
00:19:57,080 --> 00:19:55,380
the space station commander for two

511
00:19:58,520 --> 00:19:57,090
different increments that's a little bit

512
00:19:59,750 --> 00:19:58,530
different than the way we normally do

513
00:20:02,540 --> 00:19:59,760

business

514
00:20:05,120 --> 00:20:02,550
that crew member was also required to be

515
00:20:07,010 --> 00:20:05,130
able to execute spacewalks of course a

516
00:20:09,530 --> 00:20:07,020
robotics operation should any be

517
00:20:12,080 --> 00:20:09,540
required capture any freely free flyer

518
00:20:14,600 --> 00:20:12,090
cargo vehicles that may arrive so a wide

519
00:20:16,910 --> 00:20:14,610
range of a kind of standard requirements

520
00:20:20,030 --> 00:20:16,920
on top of that ability to fit in with a

521
00:20:22,550 --> 00:20:20,040
multiple crews in addition Julie

522
00:20:24,230 --> 00:20:22,560
mentioned some of the phenomenon that we

523
00:20:26,120 --> 00:20:24,240
would be investigating throughout the

524
00:20:29,690 --> 00:20:26,130
one year she particularly brought up the

525
00:20:32,480 --> 00:20:29,700
vision impairment and inter-cranial

526
00:20:34,520 --> 00:20:32,490
pressure issue the VIP phenomenon we

527
00:20:37,310 --> 00:20:34,530
needed to protect from a medical

528
00:20:40,220 --> 00:20:37,320
perspective that our one-year crewmember

529
00:20:42,950 --> 00:20:40,230
would not necessarily have a severe a

530
00:20:45,590 --> 00:20:42,960
manifestation of that phenomenon so that

531
00:20:47,270 --> 00:20:45,600
we would be able to have confidence that

532
00:20:50,000 --> 00:20:47,280
in a one-year mission they would be able

533
00:20:51,950 --> 00:20:50,010
to safely execute it in addition to that

534
00:20:53,860 --> 00:20:51,960
radiation of course is always something

535
00:20:57,110 --> 00:20:53,870
that we need to manage from our

536
00:20:58,870 --> 00:20:57,120
astronaut career perspectives to

537
00:21:02,030 --> 00:20:58,880
minimize the overall dose throughout

538
00:21:04,370 --> 00:21:02,040

focuses career so with that all of those

539
00:21:06,470 --> 00:21:04,380
factors combined the training

540
00:21:08,990 --> 00:21:06,480
requirements the qualifications for

541
00:21:11,300 --> 00:21:09,000
execution on orbit and then the medical

542
00:21:14,930 --> 00:21:11,310
requirements reduced our pool of

543
00:21:17,930 --> 00:21:14,940
available astronauts to a relatively

544
00:21:20,030 --> 00:21:17,940
small group having started with all of

545
00:21:22,520 --> 00:21:20,040
our NASA astronauts who had long

546
00:21:24,680 --> 00:21:22,530
duration experience and whittled it down

547
00:21:26,810 --> 00:21:24,690
to ones that had that long duration

548
00:21:29,660 --> 00:21:26,820
experience so that they would be good

549
00:21:31,670 --> 00:21:29,670
medical candidates and allow us to

550
00:21:34,040 --> 00:21:31,680
compare the the one-year mission with

551
00:21:36,020 --> 00:21:34,050
their six year mission we were able to

552
00:21:38,780 --> 00:21:36,030
whittle it down to a relatively small

553
00:21:41,900 --> 00:21:38,790
group and then a relatively small group

554
00:21:45,260 --> 00:21:41,910
that was extremely qualified of that

555
00:21:47,390 --> 00:21:45,270
group Scott Kelly on the US side was the

556
00:21:50,090 --> 00:21:47,400
the best balance of all of those needs

557
00:21:53,030 --> 00:21:50,100
for a one-year mission both as a

558
00:21:55,190 --> 00:21:53,040
commander both as a highly successful of

559
00:21:58,010 --> 00:21:55,200
long-duration crew member in the past a

560
00:22:00,140 --> 00:21:58,020
successful shuttle commander and so I

561
00:22:02,750 --> 00:22:00,150
think along with everyone else has a

562
00:22:04,850 --> 00:22:02,760
extremely high confidence that along

563
00:22:06,470 --> 00:22:04,860

with Misha he'll make a an excellent a

564
00:22:09,260 --> 00:22:06,480
one-year crew member from the NASA

565
00:22:12,570 --> 00:22:09,270
perspective I will throw out there that

566
00:22:14,970 --> 00:22:12,580
while we're expecting great success from

567
00:22:16,980 --> 00:22:14,980
that's a 10 increments from now we've

568
00:22:19,139 --> 00:22:16,990
got a lot of great crews that are also

569
00:22:21,480 --> 00:22:19,149
we're expecting great things from as we

570
00:22:25,590 --> 00:22:21,490
as we work our way toward towards the

571
00:22:27,029 --> 00:22:25,600
one-year mission okay that is going to

572
00:22:28,440 --> 00:22:27,039
wrap up the opening statements from here

573
00:22:31,080 --> 00:22:28,450
in Houston we're now going to go to

574
00:22:42,159 --> 00:22:31,090
Moscow and hear from mr. Krasnov mr.

575
00:22:49,879 --> 00:22:45,560
what's a Macaulay jia liu xia and

576
00:22:52,639 --> 00:22:49,889
friends no no I gotta make the move over

577
00:22:54,320 --> 00:22:52,649
zonda for me I would like to add some

578
00:22:58,009 --> 00:22:54,330
comments to what our colleagues have

579
00:23:01,070 --> 00:22:58,019
already said yes the idea itself of the

580
00:23:04,430 --> 00:23:01,080
one year flight not soon as his

581
00:23:09,109 --> 00:23:04,440
soaps in the Russian community exists

582
00:23:12,409 --> 00:23:09,119
for a long time to Gaza known as they

583
00:23:18,229 --> 00:23:12,419
rightly said we have this experience of

584
00:23:22,219 --> 00:23:18,239
long-duration flights the last flight of

585
00:23:25,909 --> 00:23:22,229
this duration was rather long ago and we

586
00:23:29,479 --> 00:23:25,919
would like to renew all the new puppy

587
00:23:32,959 --> 00:23:29,489
this experience and compare the data

588
00:23:35,690 --> 00:23:32,969

that we have accumulated with the data

589
00:23:38,690 --> 00:23:35,700
that we will be able to get on the new

590
00:23:41,299 --> 00:23:38,700
level of development first of all of

591
00:23:43,729 --> 00:23:41,309
course it's medical science experiments

592
00:23:53,109 --> 00:23:43,739
and research will be sure this is not

593
00:23:59,930 --> 00:23:53,119
school during the year 2016 this second

594
00:24:05,419 --> 00:23:59,940
point that we have the time to maintain

595
00:24:07,820 --> 00:24:05,429
station until the year at 2020 and the

596
00:24:09,919 --> 00:24:07,830
time is short there are many things that

597
00:24:12,700 --> 00:24:09,929
we don't know in spite of the fact that

598
00:24:15,919 --> 00:24:12,710
we have a lot of experience of

599
00:24:19,779 --> 00:24:15,929
spaceflight I would like to show you a

600
00:24:23,869 --> 00:24:19,789
table across these dogs you have this

601
00:24:28,869 --> 00:24:23,879
red columns the medical personnel was

602
00:24:32,659 --> 00:24:28,879
telling us about the risks so these red

603
00:24:36,709 --> 00:24:32,669
squares here represent the risks you see

604
00:24:40,099 --> 00:24:36,719
how many risks there are so they

605
00:24:43,369 --> 00:24:40,109
demonstrate our readiness for the long

606
00:24:49,099 --> 00:24:43,379
duration of flights to the moon to the

607
00:24:54,230 --> 00:24:49,109
asteroid and to Mars eventually so in

608
00:24:56,690 --> 00:24:54,240
this connection we have reached this con

609
00:25:00,590 --> 00:24:56,700
illusion together with our partners and

610
00:25:03,770 --> 00:25:00,600
colleagues risky that we should take

611
00:25:07,790 --> 00:25:03,780
some risks upon ourselves risks

612
00:25:11,240 --> 00:25:07,800
connected with a one-year mission and

613
00:25:13,460 --> 00:25:11,250

we'll try to determine the negative

614
00:25:18,100 --> 00:25:13,470
impact that this long duration flight

615
00:25:22,220 --> 00:25:18,110
might have on the body on the human body

616
00:25:26,410 --> 00:25:22,230
and so we are working out of the program

617
00:25:30,710 --> 00:25:26,420
that has the scientific part to it and

618
00:25:34,340 --> 00:25:30,720
also operational part 8 as a preparation

619
00:25:36,830 --> 00:25:34,350
for the long-duration flights this

620
00:25:39,910 --> 00:25:36,840
program is connected with the new

621
00:25:41,780 --> 00:25:39,920
technology testing of course technology

622
00:25:47,270 --> 00:25:41,790
connected first of all to the life

623
00:25:50,810 --> 00:25:47,280
supporting system systems systems of the

624
00:25:54,500 --> 00:25:50,820
closed cycle so to say a water

625
00:25:57,700 --> 00:25:54,510
processing for example good with the

626
00:26:00,950 --> 00:25:57,710
system that will enable to use the water

627
00:26:06,290 --> 00:26:00,960
again and again also atmosphere

628
00:26:10,010 --> 00:26:06,300
purification systems systems that clean

629
00:26:14,570 --> 00:26:10,020
atmosphere from impurities also would

630
00:26:18,400 --> 00:26:14,580
like to test hygienic procedures we will

631
00:26:20,690 --> 00:26:18,410
probably have to go back to some things

632
00:26:22,910 --> 00:26:20,700
you know that are already almost

633
00:26:27,320 --> 00:26:22,920
forgotten for example maybe the

634
00:26:30,890 --> 00:26:27,330
procedures of wet wet procedures so to

635
00:26:34,340 --> 00:26:30,900
say cleaning of body and hair using

636
00:26:37,160 --> 00:26:34,350
water I think we should revisit these

637
00:26:40,190 --> 00:26:37,170
procedures serious illness what was me

638
00:26:44,060 --> 00:26:40,200

also a lot of issues will be connected

639
00:26:47,740 --> 00:26:44,070
with the rehabilitation of human body

640
00:26:54,110 --> 00:26:47,750
after the long duration flight in space

641
00:26:58,520 --> 00:26:54,120
so we will have to test some new devices

642
00:27:00,260 --> 00:26:58,530
like for example treadmill and other

643
00:27:03,250 --> 00:27:00,270
things that are being developed at the

644
00:27:05,000 --> 00:27:03,260
IBM p so there's a whole complex of

645
00:27:08,120 --> 00:27:05,010
issues

646
00:27:12,250 --> 00:27:08,130
that we would like to test on more de

647
00:27:16,810 --> 00:27:12,260
station during one year it will be just

648
00:27:19,700 --> 00:27:16,820
pure research and also practical tasks

649
00:27:22,580 --> 00:27:19,710
of course we understand that in

650
00:27:24,770 --> 00:27:22,590
perspective maybe in 10 years time

651
00:27:29,600 --> 00:27:24,780
according to our assessment we will

652
00:27:33,590 --> 00:27:29,610
approach closely they need to go to a

653
00:27:36,040 --> 00:27:33,600
different level low Earth orbit I cannot

654
00:27:39,230 --> 00:27:36,050
say that it is you know we have finished

655
00:27:43,820 --> 00:27:39,240
researching and testing everything in

656
00:27:47,200 --> 00:27:43,830
this environment but it is clear that we

657
00:27:50,870 --> 00:27:47,210
have to go beyond the low Earth orbit

658
00:27:54,110 --> 00:27:50,880
Brazil a nice girl who's not into deep

659
00:28:00,010 --> 00:27:54,120
space and it will probably be connected

660
00:28:03,470 --> 00:28:00,020
with moon at first then maybe the other

661
00:28:11,050 --> 00:28:03,480
what is like asteroids so we will try to

662
00:28:16,160 --> 00:28:11,060
realize the long dream of scientists to

663
00:28:19,130 --> 00:28:16,170

step on something that hadn't been tried

664
00:28:24,800 --> 00:28:19,140
before like Mars surface for example so

665
00:28:29,180 --> 00:28:24,810
i hope this one year duration expedition

666
00:28:31,400 --> 00:28:29,190
will help us to achieve these tasks so

667
00:28:35,990 --> 00:28:31,410
if you look at this red squares there

668
00:28:38,720 --> 00:28:36,000
are seven areas and julie robinson has

669
00:28:41,990 --> 00:28:38,730
already mentioned the areas that we will

670
00:28:44,840 --> 00:28:42,000
pay the utmost attention to mostly they

671
00:28:46,790 --> 00:28:44,850
are connected with medical issues so

672
00:28:50,050 --> 00:28:46,800
hopefully we will move on from the red

673
00:28:54,890 --> 00:28:50,060
to yellow and then eventually to green

674
00:28:56,690 --> 00:28:54,900
and that we will be able to meet the

675
00:28:58,430 --> 00:28:56,700
risks and to mitigate the risks

676
00:29:01,790 --> 00:28:58,440
connected with the long-duration flight

677
00:29:05,570 --> 00:29:01,800
eventually also I would like to say it

678
00:29:10,160 --> 00:29:05,580
won't be the only one of flight of this

679
00:29:14,570 --> 00:29:10,170
duration right now we are still hesitant

680
00:29:16,760 --> 00:29:14,580
to take some other decisions right now

681
00:29:18,910 --> 00:29:16,770
we decided on this particular flight

682
00:29:25,910 --> 00:29:18,920
that will fly in

683
00:29:30,890 --> 00:29:25,920
20 2015 in the preparation for this

684
00:29:36,370 --> 00:29:30,900
flight with you master builder I think

685
00:29:42,350 --> 00:29:36,380
we will be able to reach some new goals

686
00:29:45,110 --> 00:29:42,360
somewhere around 2018 maybe it sounds

687
00:29:48,650 --> 00:29:45,120
like a science fiction you know to have

688
00:29:52,880 --> 00:29:48,660

this very long duration of light in

689
00:29:55,400 --> 00:29:52,890
space and then you know that will be in

690
00:29:58,640 --> 00:29:55,410
space as long as it is required to reach

691
00:30:01,880 --> 00:29:58,650
Mars surface and then to receive them on

692
00:30:04,370 --> 00:30:01,890
earth so it might sound like science

693
00:30:07,220 --> 00:30:04,380
fiction now but we are already working

694
00:30:10,880 --> 00:30:07,230
with our colleagues we will try to

695
00:30:15,770 --> 00:30:10,890
simulate this flight first and then to

696
00:30:20,180 --> 00:30:15,780
send them to real flight to Mars so I

697
00:30:25,520 --> 00:30:20,190
think it's a big grandiose project that

698
00:30:28,490 --> 00:30:25,530
we are dreaming to carry out but the

699
00:30:31,490 --> 00:30:28,500
first stage the first step for this

700
00:30:33,980 --> 00:30:31,500
dream in the future of course is the

701
00:30:36,770 --> 00:30:33,990
long duration flight that we are talking

702
00:30:40,810 --> 00:30:36,780
about today so I am giving the floor to

703
00:30:45,290 --> 00:30:40,820
my colleagues now Sergei krikalev

704
00:30:47,000 --> 00:30:45,300
director of the cosmonaut training

705
00:30:49,400 --> 00:30:47,010
center of course will add something more

706
00:30:50,890 --> 00:30:49,410
as well as eager oushak off the director

707
00:30:54,440 --> 00:30:50,900
of the institute for biological

708
00:30:57,290 --> 00:30:54,450
biomedical problems so Alex about it she

709
00:30:59,540 --> 00:30:57,300
was already mentioned go to quit with

710
00:31:02,960 --> 00:30:59,550
you that the preparation of the crew for

711
00:31:07,160 --> 00:31:02,970
this year-long expedition will soon

712
00:31:10,220 --> 00:31:07,170
begin it won't be very new to us as

713
00:31:13,630 --> 00:31:10,230

already has been said we have the

714
00:31:16,790 --> 00:31:13,640
experience of year long and even a

715
00:31:19,700 --> 00:31:16,800
longer expeditions the first flight took

716
00:31:22,669 --> 00:31:19,710
place during the mere expedition when he

717
00:31:26,960 --> 00:31:22,679
Romanian cut the father of ramen

718
00:31:32,419 --> 00:31:26,970
Romanian come who is the member of the

719
00:31:36,080 --> 00:31:32,429
cosmonaut Corps now so he spent 11

720
00:31:40,909 --> 00:31:36,090
on the situation and also of Jeff flight

721
00:31:47,060 --> 00:31:40,919
was over one year of belicoff also he is

722
00:31:50,930 --> 00:31:47,070
a he has made a record with a state of

723
00:31:54,799 --> 00:31:50,940
14 months on the station so it won't be

724
00:31:56,690 --> 00:31:54,809
altogether in you for us double God of

725
00:32:01,730 --> 00:31:56,700
Coonans captain and the preparation that

726
00:32:08,600 --> 00:32:01,740
is going on right now at gctc actually

727
00:32:10,999 --> 00:32:08,610
is very similar to see long duration of

728
00:32:14,299 --> 00:32:11,009
light that we are planning but of course

729
00:32:15,950 --> 00:32:14,309
the results of this flight might be very

730
00:32:19,159 --> 00:32:15,960
different of course there are new

731
00:32:24,320 --> 00:32:19,169
capabilities now that we have at our

732
00:32:26,269 --> 00:32:24,330
disposal also new training devices new

733
00:32:30,350 --> 00:32:26,279
experiments so we will look at the

734
00:32:33,259 --> 00:32:30,360
results was when we had this long

735
00:32:37,190 --> 00:32:33,269
duration flights before we had different

736
00:32:41,109 --> 00:32:37,200
approaches to that voluto slipstream a

737
00:32:43,580 --> 00:32:41,119
little incident so we very well know

738
00:32:46,789 --> 00:32:43,590

almost everything about the flight of

739
00:32:50,869 --> 00:32:46,799
two or three months duration even six

740
00:32:54,289 --> 00:32:50,879
month duration but not much more so

741
00:32:57,889 --> 00:32:54,299
during this time a lot of new things

742
00:33:01,999 --> 00:32:57,899
appeared for example I was talking to

743
00:33:05,600 --> 00:33:02,009
American astronauts who just come back

744
00:33:08,239 --> 00:33:05,610
from the station and they used the new

745
00:33:09,350 --> 00:33:08,249
training devices that have they have

746
00:33:13,090 --> 00:33:09,360
onboard the station and they were

747
00:33:16,940 --> 00:33:13,100
telling me that the bone mass loss

748
00:33:20,269 --> 00:33:16,950
practically is not happening anymore but

749
00:33:23,049 --> 00:33:20,279
the new issues have arisen since the

750
00:33:27,950 --> 00:33:23,059
time like for example visual impairment

751
00:33:31,369 --> 00:33:27,960
intracranial pressure and so we should

752
00:33:34,519 --> 00:33:31,379
study this thoroughly we need to acquire

753
00:33:37,519 --> 00:33:34,529
data acquired statistical data in order

754
00:33:41,750 --> 00:33:37,529
to analyze that those are looking at

755
00:33:45,200 --> 00:33:41,760
cell number I think that even or

756
00:33:48,200 --> 00:33:45,210
a year-long expedition you know just

757
00:33:51,470 --> 00:33:48,210
this one year-long expedition will yield

758
00:33:55,630 --> 00:33:51,480
a lot of results it will allow us to

759
00:33:58,370 --> 00:33:55,640
interpret the data that we receive from

760
00:34:01,280 --> 00:33:58,380
regular flight so to say in a different

761
00:34:04,250 --> 00:34:01,290
way under a different light it is

762
00:34:10,909 --> 00:34:04,260
meaning under and it will also allow us

763
00:34:14,300 --> 00:34:10,919

to understand the longer impact the

764
00:34:17,540 --> 00:34:14,310
impact that show after you know the air

765
00:34:20,930 --> 00:34:17,550
long expedition when the crew comes on

766
00:34:23,470 --> 00:34:20,940
the in the back in the student as for

767
00:34:26,750 --> 00:34:23,480
the training as I've already said

768
00:34:29,899 --> 00:34:26,760
nothing complicated for us of course

769
00:34:34,159 --> 00:34:29,909
there will be differences here before we

770
00:34:37,520 --> 00:34:34,169
trained three ashli submitted remember

771
00:34:40,100 --> 00:34:37,530
crews they were training together now we

772
00:34:42,230 --> 00:34:40,110
will have to do it differently a new

773
00:34:44,750 --> 00:34:42,240
ocean to move the crew configured sister

774
00:34:46,700 --> 00:34:44,760
Alice and so the configuration of the

775
00:34:49,100 --> 00:34:46,710
crew will change so this will be

776
00:34:52,480 --> 00:34:49,110
different as for the modern conditions

777
00:34:56,300 --> 00:34:52,490
when we have a six-member crew on board

778
00:34:59,510 --> 00:34:56,310
when we have to say use vehicles dr. the

779
00:35:03,140 --> 00:34:59,520
situation qmobile is cool so this is the

780
00:35:07,460 --> 00:35:03,150
modern configuration so to say and it

781
00:35:10,190 --> 00:35:07,470
will be different the most money at the

782
00:35:13,880 --> 00:35:10,200
school no monkey possibly do to go to so

783
00:35:17,900 --> 00:35:13,890
one crew will have to be prepared you

784
00:35:20,750 --> 00:35:17,910
know to work with three people then with

785
00:35:23,450 --> 00:35:20,760
another three people when the crew

786
00:35:29,000 --> 00:35:23,460
rotates and so there will be more

787
00:35:32,120 --> 00:35:29,010
coordination and more people to to be

788
00:35:34,070 --> 00:35:32,130

able to interact with experimental just

789
00:35:36,200 --> 00:35:34,080
now eager bodies which will tell us

790
00:35:38,900 --> 00:35:36,210
about experiments of course experiments

791
00:35:44,270 --> 00:35:38,910
will be mostly medical but not only

792
00:35:46,850 --> 00:35:44,280
medical right now the crews carry out

793
00:35:49,310 --> 00:35:46,860
lots of different various experiments

794
00:35:51,020 --> 00:35:49,320
onboard the station but of course the

795
00:35:53,720 --> 00:35:51,030
medical experiment so we'll have the

796
00:35:58,109 --> 00:35:53,730
priority in this of life

797
00:36:00,599 --> 00:35:58,119
thank you sir game boom boom dear ladies

798
00:36:05,730 --> 00:36:00,609
and gentlemen who's on callaghan and

799
00:36:10,260 --> 00:36:05,740
colleagues Belushi knows God knows I've

800
00:36:12,089 --> 00:36:10,270
heard a lot of very correct comments by

801
00:36:15,300 --> 00:36:12,099
American colleagues and by the Russian

802
00:36:17,670 --> 00:36:15,310
specialists about the necessity and

803
00:36:22,710 --> 00:36:17,680
about the rationale for this year-long

804
00:36:25,140 --> 00:36:22,720
expedition public me I think a lot of

805
00:36:28,530 --> 00:36:25,150
things will be published in the media we

806
00:36:30,270 --> 00:36:28,540
are here not for the details the most

807
00:36:33,900 --> 00:36:30,280
important thing i want to say first of

808
00:36:35,730 --> 00:36:33,910
all i would like to thank our American

809
00:36:39,089 --> 00:36:35,740
colleagues that we showed the

810
00:36:41,670 --> 00:36:39,099
photographs of the cosmonauts so that

811
00:36:45,990 --> 00:36:41,680
were in space for a year and more they

812
00:36:48,210 --> 00:36:46,000
all are alive and well today their

813
00:36:51,540 --> 00:36:48,220

health taters is quite good for their

814
00:36:55,710 --> 00:36:51,550
age we meet with them on a regular basis

815
00:36:57,720 --> 00:36:55,720
we invite them to celebrations we meet

816
00:37:02,609 --> 00:36:57,730
with them during the scientific

817
00:37:07,640 --> 00:37:02,619
conferences diversity so the flight that

818
00:37:10,309 --> 00:37:07,650
happened twenty four dash 13 years ago a

819
00:37:14,430 --> 00:37:10,319
Brazilian culture they did not

820
00:37:16,859 --> 00:37:14,440
negatively impact their health prosecco

821
00:37:19,200 --> 00:37:16,869
can you choose to disable people so if

822
00:37:22,050 --> 00:37:19,210
somebody is worried how they felt after

823
00:37:24,960 --> 00:37:22,060
the flights there are many different

824
00:37:27,480 --> 00:37:24,970
details there is a legend actually among

825
00:37:31,670 --> 00:37:27,490
cosmonauts maybe Sergey will correct me

826
00:37:34,109 --> 00:37:31,680
if I'm wrong especially when one of the

827
00:37:39,030 --> 00:37:34,119
cosmonauts was asked how he was feeling

828
00:37:42,300 --> 00:37:39,040
he showed his some huge oceans below and

829
00:37:44,730 --> 00:37:42,310
when they asked what do you want he said

830
00:37:48,450 --> 00:37:44,740
I want to have a smoke and to kiss my

831
00:37:50,819 --> 00:37:48,460
wife so you can charge by this answer

832
00:37:53,839 --> 00:37:50,829
that the guy who came from a

833
00:37:56,400 --> 00:37:53,849
long-duration flight is in a good mood

834
00:37:58,470 --> 00:37:56,410
although of course it was a little bit

835
00:38:02,069 --> 00:37:58,480
of bravado of course the long-duration

836
00:38:05,220 --> 00:38:02,079
flight is not a walk you know but

837
00:38:08,010 --> 00:38:05,230
serious mission

838
00:38:10,250 --> 00:38:08,020

UCP ready to go bully seriously so if we

839
00:38:13,380 --> 00:38:10,260
start talking about more serious things

840
00:38:16,260 --> 00:38:13,390
of course the risks in the year-long

841
00:38:18,840 --> 00:38:16,270
expedition the medical risks are higher

842
00:38:23,430 --> 00:38:18,850
at least twice as higher than for the

843
00:38:25,290 --> 00:38:23,440
six months duration flight of the we

844
00:38:27,840 --> 00:38:25,300
have lots of data a lot of statistical

845
00:38:34,349 --> 00:38:27,850
data again American colleagues showed us

846
00:38:38,010 --> 00:38:34,359
the tables and diagrams so we will have

847
00:38:39,540 --> 00:38:38,020
to see how the adaptation will go on for

848
00:38:43,410 --> 00:38:39,550
the crew members who will come back from

849
00:38:46,230 --> 00:38:43,420
the L on expedition so we know how

850
00:38:49,320 --> 00:38:46,240
squatted knew how you felt when they

851
00:38:50,940 --> 00:38:49,330
flew to space so it's very interesting

852
00:38:56,070 --> 00:38:50,950
approach and I think we should apply it

853
00:39:00,050 --> 00:38:56,080
so the risk to have some kind of

854
00:39:04,109 --> 00:39:00,060
impairment that will require medical

855
00:39:06,030 --> 00:39:04,119
intervention for a healthy person and

856
00:39:09,210 --> 00:39:06,040
our cosmos and listeners are healthy

857
00:39:16,980 --> 00:39:09,220
people is about seven percent this is an

858
00:39:22,430 --> 00:39:16,990
average figure good though it might be

859
00:39:27,630 --> 00:39:22,440
some minor illness but still required

860
00:39:31,380 --> 00:39:27,640
medical intubation so this so the risk

861
00:39:33,480 --> 00:39:31,390
will double so at for at least for one

862
00:39:37,440 --> 00:39:33,490
of the two it will be fourteen percent

863
00:39:40,200 --> 00:39:37,450

for the year-long expedition you know

864
00:39:43,440 --> 00:39:40,210
middle school disco so we have some

865
00:39:46,530 --> 00:39:43,450
increased medical risks for this flight

866
00:39:49,170 --> 00:39:46,540
I would like to knock on wood that it

867
00:39:51,840 --> 00:39:49,180
won't happen is the worst scenario I

868
00:39:54,240 --> 00:39:51,850
will do everything that nothing will

869
00:39:57,120 --> 00:39:54,250
happen to the health status but the risk

870
00:40:00,240 --> 00:39:57,130
is increased risk for this flight that's

871
00:40:03,240 --> 00:40:00,250
for sure and the medical support of the

872
00:40:08,700 --> 00:40:03,250
year-long expedition also it was very

873
00:40:13,500 --> 00:40:08,710
good before it also will be different so

874
00:40:16,590 --> 00:40:13,510
it is a flight on a new station the

875
00:40:19,860 --> 00:40:16,600
station that has lots of new models

876
00:40:21,810 --> 00:40:19,870
in berlin in it dumb and it required our

877
00:40:23,100 --> 00:40:21,820
very close attention so the American

878
00:40:26,130 --> 00:40:23,110
colleagues have already mentioned that

879
00:40:28,740 --> 00:40:26,140
the new risks have appeared like the

880
00:40:31,260 --> 00:40:28,750
already mentioned VIP risks intracranial

881
00:40:33,030 --> 00:40:31,270
pressure and we are constantly in touch

882
00:40:37,340 --> 00:40:33,040
with the American colleagues julia

883
00:40:41,790 --> 00:40:37,350
robinson for example participated in the

884
00:40:44,460 --> 00:40:41,800
conference at i'm a MP and we are all we

885
00:40:47,430 --> 00:40:44,470
constantly talking to each other

886
00:40:51,780 --> 00:40:47,440
discussing the new problems issues and

887
00:40:53,940 --> 00:40:51,790
risks right now we won the astronauts

888
00:40:56,760 --> 00:40:53,950

who are go into specimen for six months

889
00:40:59,580 --> 00:40:56,770
that they might face such risks as a

890
00:41:04,890 --> 00:40:59,590
visual impairment for example so it is

891
00:41:09,120 --> 00:41:04,900
very important to study jointly this is

892
00:41:13,440 --> 00:41:09,130
risks like VIP visual impairment muda

893
00:41:17,580 --> 00:41:13,450
risk connected to the higher

894
00:41:20,610 --> 00:41:17,590
intracranial pressure apart from these

895
00:41:24,750 --> 00:41:20,620
risks there are other issues that we

896
00:41:27,510 --> 00:41:24,760
will study of course lamar odom is

897
00:41:30,060 --> 00:41:27,520
plenty of people and having in mind the

898
00:41:33,560 --> 00:41:30,070
long-duration flights beyond the low

899
00:41:37,770 --> 00:41:33,570
Earth orbit Tomas Alexei bodies which

900
00:41:40,910 --> 00:41:37,780
mentioned Mars 500 experiment that we've

901
00:41:43,380 --> 00:41:40,920
finished not so long ago american

902
00:41:48,210 --> 00:41:43,390
scientists participated in this project

903
00:41:51,090 --> 00:41:48,220
start very extensively a few

904
00:41:53,760 --> 00:41:51,100
laboratories participated and collected

905
00:41:57,480 --> 00:41:53,770
a lot of data on psych psychology of the

906
00:42:00,510 --> 00:41:57,490
long-duration isolation and this data

907
00:42:03,210 --> 00:42:00,520
also will be used in the preparation and

908
00:42:04,620 --> 00:42:03,220
carrying out of your long expedition i

909
00:42:08,000 --> 00:42:04,630
would like to remind you that in the

910
00:42:12,450 --> 00:42:08,010
year two thousand thirteen and fourteen

911
00:42:16,050 --> 00:42:12,460
we will increase the arsenal of the

912
00:42:19,050 --> 00:42:16,060
preventive measures it will be new

913
00:42:22,260 --> 00:42:19,060

treadmill also the new resistive

914
00:42:25,140 --> 00:42:22,270
exercise device that we will be able to

915
00:42:27,730 --> 00:42:25,150
use the new and we have joined plans the

916
00:42:32,000 --> 00:42:27,740
American colleagues to use

917
00:42:40,789 --> 00:42:32,010
bracelets or occlusion brands bracelets

918
00:42:44,089 --> 00:42:40,799
as we call them they are 40 chibis for

919
00:42:49,400 --> 00:42:44,099
monitoring and also chippies spacesuit

920
00:42:54,309 --> 00:42:49,410
of for mediumistic remediation of the

921
00:42:59,359 --> 00:42:54,319
possible impacts that might lead to the

922
00:43:02,390 --> 00:42:59,369
hydrant and cranial pressure so American

923
00:43:04,339 --> 00:43:02,400
scientists have this hypothesis that it

924
00:43:07,130 --> 00:43:04,349
might lead to the heightened

925
00:43:10,250 --> 00:43:07,140
intracranial pressure and we have to

926
00:43:13,400 --> 00:43:10,260
study these hypotheses and will work in

927
00:43:15,920 --> 00:43:13,410
this direction besides a very

928
00:43:20,510 --> 00:43:15,930
interesting issue is the problem of

929
00:43:28,069 --> 00:43:20,520
return from microgravity to Earth's

930
00:43:31,940 --> 00:43:28,079
gravity mercy also the micro gravity on

931
00:43:36,500 --> 00:43:31,950
Mars is zero 38g it will be slightly

932
00:43:42,019 --> 00:43:36,510
different and we'll need to see what the

933
00:43:44,569 --> 00:43:42,029
astronaut and astronaut be able to do

934
00:43:46,130 --> 00:43:44,579
what his performance will be after

935
00:43:50,260 --> 00:43:46,140
returning through this partial

936
00:43:53,799 --> 00:43:50,270
microgravity so as Julia rightly said

937
00:43:58,450 --> 00:43:53,809
together with American scientists we

938
00:44:02,930 --> 00:43:58,460

sort of a special experiment field tests

939
00:44:08,329 --> 00:44:02,940
they are quite simple test that will

940
00:44:11,299 --> 00:44:08,339
help us to understand the what person is

941
00:44:15,950 --> 00:44:11,309
able to do during the first few minutes

942
00:44:18,319 --> 00:44:15,960
after LZ landing it is very first

943
00:44:20,390 --> 00:44:18,329
minutes after the landing so it's very

944
00:44:25,420 --> 00:44:20,400
interesting experiment and we will

945
00:44:29,359 --> 00:44:25,430
perform it jointly with american medical

946
00:44:34,690 --> 00:44:29,369
scientists she does cool reema well so

947
00:44:40,180 --> 00:44:38,269
you know how people can perform in the

948
00:44:42,760 --> 00:44:40,190
very first

949
00:44:44,380 --> 00:44:42,770
minutes and hours after the return for

950
00:44:47,910 --> 00:44:44,390
example whether they will be able to

951
00:44:50,109 --> 00:44:47,920
help each other to dock the space suit

952
00:44:54,480 --> 00:44:50,119
apart from these experiments there are

953
00:44:58,599 --> 00:44:54,490
many other ones we have already shared

954
00:45:01,000 --> 00:44:58,609
our experiments and our management the

955
00:45:03,819 --> 00:45:01,010
criticizes are that a lot of experiments

956
00:45:06,730 --> 00:45:03,829
actually searching one experiments in

957
00:45:09,370 --> 00:45:06,740
half of them will fall to the year two

958
00:45:13,120 --> 00:45:09,380
thousand fifteen and sixteen which

959
00:45:15,569 --> 00:45:13,130
coincide with a year-long expedition so

960
00:45:19,329 --> 00:45:15,579
the program will be integrated one and

961
00:45:20,890 --> 00:45:19,339
ideally joined one of course we will

962
00:45:25,000 --> 00:45:20,900
choose the most important most

963
00:45:27,700 --> 00:45:25,010

interesting experiments and both

964
00:45:29,470 --> 00:45:27,710
American and Russian crew members will

965
00:45:31,930 --> 00:45:29,480
participate in these experiments and

966
00:45:35,069 --> 00:45:31,940
they will not only concern year-long

967
00:45:38,530 --> 00:45:35,079
expedition but there will also be

968
00:45:41,980 --> 00:45:38,540
ordinary experiments that crews do on

969
00:45:44,470 --> 00:45:41,990
orbit regularly to tell the truth I

970
00:45:47,530 --> 00:45:44,480
don't understand the opinion of some

971
00:45:50,589 --> 00:45:47,540
American colleagues that I heard that

972
00:45:53,200 --> 00:45:50,599
some things like a tilt test for example

973
00:45:58,059 --> 00:45:53,210
we can already use after six years

974
00:46:00,910 --> 00:45:58,069
duration flights which is not so we can

975
00:46:06,970 --> 00:46:00,920
use these tests even after the six month

976
00:46:08,410 --> 00:46:06,980
duration flight and I actually agree

977
00:46:10,420 --> 00:46:08,420
with the American College School think

978
00:46:14,470 --> 00:46:10,430
that we should do this and we will be

979
00:46:17,680 --> 00:46:14,480
able to collect some data it was kinda

980
00:46:19,569 --> 00:46:17,690
mention we are not doing it yet after

981
00:46:22,839 --> 00:46:19,579
the six months durations right I think

982
00:46:26,200 --> 00:46:22,849
we can start all ready to do this

983
00:46:28,599 --> 00:46:26,210
testing so I don't think wish we should

984
00:46:31,450 --> 00:46:28,609
not keep all our hopes on to the

985
00:46:33,790 --> 00:46:31,460
year-long expedition we should you know

986
00:46:37,390 --> 00:46:33,800
start doing some experiments and tests

987
00:46:39,609 --> 00:46:37,400
right now I think I have exceeded the

988
00:46:42,010 --> 00:46:39,619

time allocated for me so I would like to

989
00:46:45,280 --> 00:46:42,020
wish everyone success in this very

990
00:46:48,520 --> 00:46:45,290
important mission and also like to thank

991
00:46:50,790 --> 00:46:48,530
NASA management and our management of

992
00:46:54,450 --> 00:46:50,800
res cosmos that they were able to plan

993
00:46:58,390 --> 00:46:54,460
this absolutely new step

994
00:47:01,480 --> 00:46:58,400
towards the new level of space

995
00:47:04,600 --> 00:47:01,490
exploration and is a new level there are

996
00:47:06,340 --> 00:47:04,610
new risks new conditions you terms don't

997
00:47:09,280 --> 00:47:06,350
give you or even appreciate

998
00:47:11,950 --> 00:47:09,290
cannulated polluted and many other

999
00:47:15,220 --> 00:47:11,960
things that make this future year-long

1000
00:47:19,990 --> 00:47:15,230
expedition news business store moment

1001
00:47:23,980 --> 00:47:20,000
and you move on the way of the flights

1002
00:47:28,990 --> 00:47:23,990
into deep space so first of all let's

1003
00:47:32,370 --> 00:47:29,000
wish health two crew members for the two

1004
00:47:38,590 --> 00:47:32,380
years before this year-long expedition

1005
00:47:40,510 --> 00:47:38,600
they have to try to stay healthy and I

1006
00:47:43,030 --> 00:47:40,520
also would like with good health to all

1007
00:47:46,480 --> 00:47:43,040
participants of this conference which

1008
00:47:54,400 --> 00:47:46,490
actually resembles more scientific

1009
00:47:55,570 --> 00:47:54,410
conferences okay thank you okay we want

1010
00:47:57,010 --> 00:47:55,580
to thank our Russian colleagues we're

1011
00:47:58,360 --> 00:47:57,020
going to take questions now from the

1012
00:48:00,340 --> 00:47:58,370
media here in Houston then we'll go to

1013
00:48:02,410 --> 00:48:00,350

the Kennedy Space Center and then we'll

1014
00:48:03,820 --> 00:48:02,420
go over to a Moscow and then we'll go to

1015
00:48:05,710 --> 00:48:03,830
the phone lines we're going to attempt

1016
00:48:08,200 --> 00:48:05,720
to take as many questions as we possibly

1017
00:48:09,940 --> 00:48:08,210
can we're getting close to our end time

1018
00:48:12,280 --> 00:48:09,950
here's we're going to try to run through

1019
00:48:14,410 --> 00:48:12,290
these as quickly as we can so make sure

1020
00:48:16,540 --> 00:48:14,420
that you direct your question to the

1021
00:48:20,170 --> 00:48:16,550
appropriate person and we'll start over

1022
00:48:24,310 --> 00:48:20,180
here with Jim good morning Jim Oberg on

1023
00:48:26,890 --> 00:48:24,320
NBC that's for Mike this is a great

1024
00:48:29,380 --> 00:48:26,900
program so it looks terrific don't we

1025
00:48:31,480 --> 00:48:29,390
wind up though in that year using one

1026
00:48:33,820 --> 00:48:31,490
less Soyuz launch and landing than we're

1027
00:48:36,280 --> 00:48:33,830
paying for and will there be any kind of

1028
00:48:38,140 --> 00:48:36,290
financial changes will we get any kind

1029
00:48:40,720 --> 00:48:38,150
of refund or expense we're not going to

1030
00:48:43,540 --> 00:48:40,730
make that we would normally have made to

1031
00:48:45,370 --> 00:48:43,550
launch two men on six months that are 10

1032
00:48:46,360 --> 00:48:45,380
one year what is that going to change in

1033
00:48:49,330 --> 00:48:46,370
terms of how much money you have to

1034
00:48:51,910 --> 00:48:49,340
spend well you're correct and and we've

1035
00:48:53,620 --> 00:48:51,920
already actually discussed this because

1036
00:48:56,200 --> 00:48:53,630
of the fact that the payments for those

1037
00:48:59,110 --> 00:48:56,210
flights actually start started last

1038
00:49:01,120 --> 00:48:59,120

month so I know we get credit credit for

1039
00:49:05,650 --> 00:49:01,130
the flight we don't use and then how we

1040
00:49:10,600 --> 00:49:05,660
use that credit in the future is is up

1041
00:49:12,640 --> 00:49:10,610
for discussion of course we do have to

1042
00:49:14,110 --> 00:49:12,650
accommodate our Russian colleagues or

1043
00:49:16,900 --> 00:49:14,120
compensate our Russian colleagues for

1044
00:49:19,600 --> 00:49:16,910
the six month period of rescue when we

1045
00:49:21,400 --> 00:49:19,610
buy we buy a so you see we also get to

1046
00:49:24,040 --> 00:49:21,410
rescue for the six months as well so

1047
00:49:26,050 --> 00:49:24,050
there's a value associated with that but

1048
00:49:30,220 --> 00:49:26,060
we're we're in discussions on that and

1049
00:49:32,110 --> 00:49:30,230
as you said we will we will and or have

1050
00:49:34,570 --> 00:49:32,120
already started the contractual process

1051
00:49:36,340 --> 00:49:34,580
of crediting us ourselves for the flight

1052
00:49:38,670 --> 00:49:36,350
for the one flight that we're not using

1053
00:49:42,340 --> 00:49:38,680
and we're in the process of deciding

1054
00:49:43,780 --> 00:49:42,350
what the value of the rescue seat is and

1055
00:49:48,580 --> 00:49:43,790
taking care of that and then deciding

1056
00:49:50,890 --> 00:49:48,590
what we want to do with that credit at

1057
00:49:52,660 --> 00:49:50,900
some point assuming that dr. usha cops

1058
00:49:55,270 --> 00:49:52,670
wish that the current two crew members

1059
00:49:57,190 --> 00:49:55,280
stay healthy for two years that might

1060
00:49:59,200 --> 00:49:57,200
not happen at what point you plan on

1061
00:50:01,060 --> 00:49:59,210
working with the backup crew preparing

1062
00:50:03,280 --> 00:50:01,070
for this special training for this long

1063
00:50:04,750 --> 00:50:03,290

flight and also standing by during the

1064
00:50:06,700 --> 00:50:04,760
mission because in one long Russian

1065
00:50:09,040 --> 00:50:06,710
flight Fayette replace crewman halfway

1066
00:50:10,480 --> 00:50:09,050
through the year long flight so when do

1067
00:50:12,570 --> 00:50:10,490
you what is your plan for managing a

1068
00:50:15,130 --> 00:50:12,580
backup crew for this particular mission

1069
00:50:17,760 --> 00:50:15,140
it's a good question we've had a lot of

1070
00:50:19,990 --> 00:50:17,770
discussions on that on the US side our

1071
00:50:22,720 --> 00:50:20,000
expectation is that we would continue to

1072
00:50:24,790 --> 00:50:22,730
fall the way we describe our backup

1073
00:50:28,420 --> 00:50:24,800
process as the single flow to launch and

1074
00:50:30,370 --> 00:50:28,430
so just like a Scott Kelly and his

1075
00:50:34,030 --> 00:50:30,380
colleagues will be prepared to back up

1076
00:50:37,900 --> 00:50:34,040
the Soyuz forty crew the follow-on Soyuz

1077
00:50:40,690 --> 00:50:37,910
44 crew or 46 crew will back up the

1078
00:50:42,940 --> 00:50:40,700
Soyuz 42 crew which is this a one-year

1079
00:50:46,090 --> 00:50:42,950
the start of the one-year increment and

1080
00:50:48,850 --> 00:50:46,100
so roughly five to six months after we

1081
00:50:50,530 --> 00:50:48,860
announced Scott and got folks to work on

1082
00:50:52,720 --> 00:50:50,540
developing the training template for him

1083
00:50:54,340 --> 00:50:52,730
we'll be able to get started on the

1084
00:50:55,670 --> 00:50:54,350
training template for our backup crew

1085
00:50:58,130 --> 00:50:55,680
member to cover the pier

1086
00:51:01,220 --> 00:50:58,140
of time leading up to the launch of the

1087
00:51:03,710 --> 00:51:01,230
the one-year crew member should we be

1088
00:51:05,390 --> 00:51:03,720

faced with a problem in flight I know

1089
00:51:07,760 --> 00:51:05,400
there would be a lot of discussion both

1090
00:51:09,589 --> 00:51:07,770
on the on the US side and the Russian

1091
00:51:12,530 --> 00:51:09,599
side as to how best to deal with that

1092
00:51:14,990 --> 00:51:12,540
either to return the crew or to deal

1093
00:51:17,569 --> 00:51:15,000
with the use some sort of mitigation

1094
00:51:19,880 --> 00:51:17,579
strategy with the help of the medical

1095
00:51:22,599 --> 00:51:19,890
community to try to extend to the normal

1096
00:51:24,500 --> 00:51:22,609
nominal duration of the flight and so I

1097
00:51:26,540 --> 00:51:24,510
expected to will have a lot of

1098
00:51:29,839 --> 00:51:26,550
discussions in preparation for any

1099
00:51:31,790 --> 00:51:29,849
scenario you know NASA and will develop

1100
00:51:35,569 --> 00:51:31,800
a the flight rules associated with that

1101
00:51:38,180 --> 00:51:35,579
over the next couple of years okay let

1102
00:51:43,160 --> 00:51:38,190
me go back here to Kevin Kevin either

1103
00:51:47,780 --> 00:51:43,170
question do it ok why yes Marco for a

1104
00:51:50,510 --> 00:51:47,790
deviation week I realized there's some

1105
00:51:52,309 --> 00:51:50,520
uncertainty here and where this program

1106
00:51:56,660 --> 00:51:52,319
goes as far as whether there would be

1107
00:51:59,329 --> 00:51:56,670
additional one year missions um but at

1108
00:52:02,390 --> 00:51:59,339
this point what would you like to be

1109
00:52:04,760 --> 00:52:02,400
able to evaluate before you commit and

1110
00:52:07,010 --> 00:52:04,770
I'm wondering two additional one year

1111
00:52:10,250 --> 00:52:07,020
applies and I'm wondering if in the

1112
00:52:12,289 --> 00:52:10,260
selection of the backups you'll be

1113
00:52:14,240 --> 00:52:12,299

selecting them with the thought in mind

1114
00:52:17,120 --> 00:52:14,250
that they could do a second one year

1115
00:52:19,400 --> 00:52:17,130
flight or we do an attempt that a one

1116
00:52:24,230 --> 00:52:19,410
year of like if there was a problem with

1117
00:52:30,920 --> 00:52:24,240
the with the first attempt is that for

1118
00:52:33,380 --> 00:52:30,930
me let's say it is you know mark we

1119
00:52:36,289 --> 00:52:33,390
really we selected this crew with the

1120
00:52:40,280 --> 00:52:36,299
idea that it that we head down this path

1121
00:52:43,280 --> 00:52:40,290
and and we learn with every step even

1122
00:52:46,039 --> 00:52:43,290
just to selecting the crew alone was is

1123
00:52:47,870 --> 00:52:46,049
a it's a big step and deciding the

1124
00:52:50,599 --> 00:52:47,880
criteria for that and then deciding what

1125
00:52:52,730 --> 00:52:50,609
the science experiments are we have a

1126
00:52:55,339 --> 00:52:52,740
long discussion about the value of one

1127
00:52:57,559 --> 00:52:55,349
year versus six month in the and the

1128
00:52:59,990 --> 00:52:57,569
amount of data we get from our subjects

1129
00:53:02,809 --> 00:53:00,000
and we have a limited set of subjects so

1130
00:53:05,720 --> 00:53:02,819
whenever you do any kind of research you

1131
00:53:08,240 --> 00:53:05,730
needed a statistically significant in

1132
00:53:08,800 --> 00:53:08,250
and the end in this case is our crew

1133
00:53:12,710 --> 00:53:08,810
members

1134
00:53:15,260 --> 00:53:12,720
and so one of the big questions that

1135
00:53:17,330 --> 00:53:15,270
we're asking ourselves is and and Julie

1136
00:53:19,070 --> 00:53:17,340
talked about it is you know do you in

1137
00:53:21,050 --> 00:53:19,080
six month time have you reached

1138
00:53:24,350 --> 00:53:21,060

equilibrium in some respects and so you

1139
00:53:26,450 --> 00:53:24,360
know the human body will be fine or are

1140
00:53:28,100 --> 00:53:26,460
there other things there yet to come

1141
00:53:30,410 --> 00:53:28,110
that you don't know about so we have to

1142
00:53:33,350 --> 00:53:30,420
balance that with trying to get all the

1143
00:53:35,780 --> 00:53:33,360
data necessary to conclude the

1144
00:53:39,200 --> 00:53:35,790
experiments at six months and then go

1145
00:53:41,300 --> 00:53:39,210
look at the one year because as most of

1146
00:53:44,150 --> 00:53:41,310
you know we could probably get to Mars

1147
00:53:47,270 --> 00:53:44,160
in a six-month period although that's

1148
00:53:50,570 --> 00:53:47,280
that's a that's right at the edge of our

1149
00:53:52,010 --> 00:53:50,580
experiment experience on ISS so so we

1150
00:53:55,520 --> 00:53:52,020
have some work to do amongst with

1151
00:53:56,960 --> 00:53:55,530
partnerships the partnership to discuss

1152
00:54:00,260 --> 00:53:56,970
this further and we really haven't gone

1153
00:54:02,120 --> 00:54:00,270
very far so to speculate would be a

1154
00:54:04,850 --> 00:54:02,130
little premature at this point we've

1155
00:54:06,380 --> 00:54:04,860
left open the opportunity beyond beyond

1156
00:54:08,210 --> 00:54:06,390
this one year increment but we're really

1157
00:54:10,640 --> 00:54:08,220
focused on getting this one started now

1158
00:54:12,260 --> 00:54:10,650
it is true that if we decided after the

1159
00:54:14,300 --> 00:54:12,270
increment that we want to do more you've

1160
00:54:15,770 --> 00:54:14,310
got two and a half years later before

1161
00:54:16,810 --> 00:54:15,780
you keep do the next increment so we

1162
00:54:21,080 --> 00:54:16,820
know we have to have the discussion

1163
00:54:25,220 --> 00:54:21,090

sooner rather than later okay yes it

1164
00:54:26,840 --> 00:54:25,230
won't go I'd like to carry Bible Houston

1165
00:54:29,240 --> 00:54:26,850
public radio I'd like to hear more about

1166
00:54:32,630 --> 00:54:29,250
what you will be looking for as far as

1167
00:54:34,610 --> 00:54:32,640
behavior and crew interaction and also

1168
00:54:37,800 --> 00:54:34,620
just a quick question of

1169
00:54:41,250 --> 00:54:37,810
health effects ever been identified from

1170
00:54:43,770 --> 00:54:41,260
long-term spaceflight let's see so the

1171
00:54:45,570 --> 00:54:43,780
to the first question some of the things

1172
00:54:47,160 --> 00:54:45,580
we look at and and we've done in

1173
00:54:48,870 --> 00:54:47,170
previous studies are the interactions

1174
00:54:50,100 --> 00:54:48,880
among the crew members with each other

1175
00:54:52,760 --> 00:54:50,110
and their interactions with the ground

1176
00:54:55,140 --> 00:54:52,770
and so we'll be able to look at

1177
00:54:58,620 --> 00:54:55,150
basically statistically compare what we

1178
00:55:00,240 --> 00:54:58,630
see in the those kinds of patterns that

1179
00:55:02,160 --> 00:55:00,250
that's done by surveys and

1180
00:55:07,680 --> 00:55:02,170
questionnaires and another thing that we

1181
00:55:09,450 --> 00:55:07,690
look at is the the some self assessments

1182
00:55:11,340 --> 00:55:09,460
that the crew do on themselves which

1183
00:55:13,410 --> 00:55:11,350
helps them to assess their state of

1184
00:55:14,880 --> 00:55:13,420
readiness how responsive they are how

1185
00:55:16,500 --> 00:55:14,890
well they think they would be able to

1186
00:55:18,450 --> 00:55:16,510
respond if a crisis should arise on a

1187
00:55:20,640 --> 00:55:18,460
given day and those kinds of measures

1188
00:55:28,440 --> 00:55:20,650

also are the sorts of things that we can

1189
00:55:30,570 --> 00:55:28,450
be looking at so the really the only

1190
00:55:33,870 --> 00:55:30,580
positive health effect that I know of

1191
00:55:35,490 --> 00:55:33,880
that's been identified is there is has

1192
00:55:37,500 --> 00:55:35,500
been identified some positive psych

1193
00:55:39,600 --> 00:55:37,510
psychological effects because going into

1194
00:55:41,730 --> 00:55:39,610
space is so cool that that actually

1195
00:55:43,470 --> 00:55:41,740
looks like it offsets a lot of the

1196
00:55:45,990 --> 00:55:43,480
negative things you might imagine in

1197
00:55:50,730 --> 00:55:46,000
isolation and confinement but you know

1198
00:55:53,010 --> 00:55:50,740
that our bodies evolved in 1g and so it

1199
00:55:54,810 --> 00:55:53,020
tends to be a pretty disruptive kind of

1200
00:55:56,730 --> 00:55:54,820
change now it's not nearly as disruptive

1201
00:55:58,290 --> 00:55:56,740
as people thought before man went into

1202
00:56:01,080 --> 00:55:58,300
space humans went into space you know

1203
00:56:03,540 --> 00:56:01,090
people wondered before the very first

1204
00:56:05,310 --> 00:56:03,550
human spaceflight if our digestion would

1205
00:56:06,960 --> 00:56:05,320
work and things like that so our bodies

1206
00:56:11,190 --> 00:56:06,970
turn out to be much more resilient than

1207
00:56:12,420 --> 00:56:11,200
we thought but okay just going to wrap

1208
00:56:13,770 --> 00:56:12,430
up questions here in Houston we're going

1209
00:56:15,450 --> 00:56:13,780
to go down to the candidate space center

1210
00:56:17,400 --> 00:56:15,460
now and take questions from there then

1211
00:56:19,140 --> 00:56:17,410
we'll go to Moscow after that just a

1212
00:56:20,700 --> 00:56:19,150
reminder keep your question to a one and

1213
00:56:24,480 --> 00:56:20,710

no follow up so we can get as many as we

1214
00:56:26,460 --> 00:56:24,490
can so let's go to KSC hi Marcia Dunn

1215
00:56:28,830 --> 00:56:26,470
Associated Press for Mike suffered a

1216
00:56:32,900 --> 00:56:28,840
knee could you tell me how many how many

1217
00:56:35,940 --> 00:56:32,910
astronauts US astronauts were there

1218
00:56:37,830 --> 00:56:35,950
qualified to be considered in how how

1219
00:56:41,310 --> 00:56:37,840
short was the short list how many

1220
00:56:43,740 --> 00:56:41,320
numbers on that as well well let me let

1221
00:56:46,650 --> 00:56:43,750
Bob give you the details on that my

1222
00:56:47,960 --> 00:56:46,660
short list was was that I that I saw was

1223
00:56:50,240 --> 00:56:47,970
much shorter than the

1224
00:56:52,849 --> 00:56:50,250
Bob so want to let him discuss that for

1225
00:56:55,460 --> 00:56:52,859
you it's a it's an interesting question

1226
00:56:57,859 --> 00:56:55,470
Marcia and it really leads to at what

1227
00:57:01,040 --> 00:56:57,869
point were we making the decision there

1228
00:57:03,710 --> 00:57:01,050
was a lot of discussion and as to win

1229
00:57:06,650 --> 00:57:03,720
the actual start date of the one-year

1230
00:57:08,839 --> 00:57:06,660
mission would be and so depending on the

1231
00:57:10,609 --> 00:57:08,849
start dates you have crew members that

1232
00:57:13,099 --> 00:57:10,619
may be returning from a post flight

1233
00:57:15,620 --> 00:57:13,109
period for example who may be available

1234
00:57:17,480 --> 00:57:15,630
given a little bit more time who would

1235
00:57:19,880 --> 00:57:17,490
be a perfectly qualified for a future

1236
00:57:23,300 --> 00:57:19,890
one-year mission but based on the dates

1237
00:57:25,550 --> 00:57:23,310
that were available for the 42 Soyuz

1238
00:57:27,530 --> 00:57:25,560

launch they just weren't quite finished

1239
00:57:30,080 --> 00:57:27,540
with their post bike period in the in

1240
00:57:32,660 --> 00:57:30,090
the final analysis based on all the

1241
00:57:36,020 --> 00:57:32,670
factors we were down to a shortlist of

1242
00:57:39,680 --> 00:57:36,030
four crew members and without with three

1243
00:57:41,930 --> 00:57:39,690
folks that were really in their prime

1244
00:57:44,150 --> 00:57:41,940
for stepping into a one-year mission and

1245
00:57:48,500 --> 00:57:44,160
we're able to select Scott Kelly from

1246
00:57:51,710 --> 00:57:48,510
that group you were picking Scott and

1247
00:57:54,530 --> 00:57:51,720
picking the Russian counterpart did you

1248
00:57:56,900 --> 00:57:54,540
pick those both the two agencies pick

1249
00:57:59,000 --> 00:57:56,910
them in two vacuums or did you look at

1250
00:58:00,770 --> 00:57:59,010
each candidate and try to get a Russian

1251
00:58:04,160 --> 00:58:00,780
and an American who would get along and

1252
00:58:08,870 --> 00:58:04,170
have some similarities we normally

1253
00:58:11,720 --> 00:58:08,880
execute our selection process kind of in

1254
00:58:14,720 --> 00:58:11,730
two parallel processes that's kind of

1255
00:58:17,210 --> 00:58:14,730
meat towards the very end and so we

1256
00:58:19,190 --> 00:58:17,220
assess that final kapatic compatibility

1257
00:58:20,900 --> 00:58:19,200
with the crew members after most of the

1258
00:58:23,740 --> 00:58:20,910
selection on either side has been

1259
00:58:26,780 --> 00:58:23,750
accomplished and so we had no objections

1260
00:58:29,870 --> 00:58:26,790
and we're a confident in our Russian

1261
00:58:32,359 --> 00:58:29,880
colleagues selection when we got to the

1262
00:58:35,270 --> 00:58:32,369
final analysis and they were confident

1263
00:58:39,950 --> 00:58:35,280

into an our crew member being somebody

1264
00:58:41,030 --> 00:58:39,960
who could perform well with Misha okay

1265
00:58:42,050 --> 00:58:41,040
that's going to wrap it up from the

1266
00:58:43,760 --> 00:58:42,060
Kennedy Space Center we're going to go

1267
00:58:56,120 --> 00:58:43,770
to Moscow now and take questions from

1268
00:59:01,500 --> 00:58:58,350
alexander guardo Korean Alexander

1269
00:59:05,010 --> 00:59:01,510
covario free on over steam I will ask

1270
00:59:08,940 --> 00:59:05,020
the first question problem got out of

1271
00:59:13,560 --> 00:59:08,950
ten issues what do I do risks you know

1272
00:59:17,100 --> 00:59:13,570
who the hell's one was voiced actually

1273
00:59:31,250 --> 00:59:17,110
the increased intracranial pressure what

1274
00:59:37,940 --> 00:59:34,020
storage in kenosha tablets I have a

1275
00:59:41,510 --> 00:59:37,950
table here which represent the very well

1276
00:59:46,940 --> 00:59:41,520
the risks it was developed will you

1277
00:59:49,109 --> 00:59:46,950
accordingly to the methodology of risks

1278
00:59:52,170 --> 00:59:49,119
international mr. dollar G will discuss

1279
00:59:54,380 --> 00:59:52,180
this table quite a few times during the

1280
00:59:57,660 --> 00:59:54,390
meetings of the joint working groups

1281
01:00:05,670 --> 00:59:57,670
this is beautiful good so of the space

1282
01:00:07,349 --> 01:00:05,680
medicine exists for 41 years the space

1283
01:00:09,960 --> 01:00:07,359
medicine commission and has never

1284
01:00:14,040 --> 01:00:09,970
stopped its work so the risks are

1285
01:00:19,290 --> 01:00:14,050
connected with this skeleton apparatus

1286
01:00:22,589 --> 01:00:19,300
also movement functions also of

1287
01:00:25,410 --> 01:00:22,599
terminology syndrome the syndrome that

1288
01:00:28,320 --> 01:00:25,420

was discovered because miss kissin on

1289
01:00:32,940 --> 01:00:28,330
this on the ISS by our American

1290
01:00:35,820 --> 01:00:32,950
colleagues wounds and it is connected to

1291
01:00:38,579 --> 01:00:35,830
the increased in intracranial pressure

1292
01:00:41,339 --> 01:00:38,589
it's an absolutely new risks that we

1293
01:00:46,200 --> 01:00:41,349
didn't know before and didn't describe

1294
01:00:49,230 --> 01:00:46,210
in our space medicine publications in a

1295
01:00:54,109 --> 01:00:49,240
few publications their wars were were

1296
01:00:56,940 --> 01:00:54,119
some data by some researchers respublika

1297
01:01:00,079 --> 01:00:56,950
even Russian publications of the Soviet

1298
01:01:05,609 --> 01:01:00,089
period there were some hints on the

1299
01:01:07,530 --> 01:01:05,619
changes that might happen to the body in

1300
01:01:09,930 --> 01:01:07,540
space so we know about these

1301
01:01:12,599 --> 01:01:09,940
publications I was shown one article in

1302
01:01:15,089 --> 01:01:12,609
particular for example so the

1303
01:01:19,560 --> 01:01:15,099
foundations for this risks probably

1304
01:01:23,240 --> 01:01:19,570
existed even before but I think that

1305
01:01:28,790 --> 01:01:23,250
this risk if we use I just danced a lot

1306
01:01:32,310 --> 01:01:28,800
you know connected probably too thin you

1307
01:01:35,550 --> 01:01:32,320
consumed with full combination of

1308
01:01:39,089 --> 01:01:35,560
factors maybe it is even connected to

1309
01:01:41,640 --> 01:01:39,099
the very effective and intense use of

1310
01:01:43,680 --> 01:01:41,650
the preventive measures may be also the

1311
01:01:49,200 --> 01:01:43,690
last drop effect

1312
01:01:53,069 --> 01:01:49,210
isn't work here you know the heightened

1313
01:01:58,950 --> 01:01:53,079

pressure inside veins and inside the

1314
01:02:04,099 --> 01:01:58,960
body so it should raise to some level

1315
01:02:06,990 --> 01:02:04,109
after that some changes might occur the

1316
01:02:13,460 --> 01:02:07,000
phenomena of edema might happen that

1317
01:02:17,359 --> 01:02:13,470
will lead to the defamation of I organs

1318
01:02:21,420 --> 01:02:17,369
feeling good eyesight organs and Tuesday

1319
01:02:23,880 --> 01:02:21,430
no other impairments maybe I'm talking

1320
01:02:28,740 --> 01:02:23,890
you know in a sign to scientific

1321
01:02:31,579 --> 01:02:28,750
language but I think this is a last John

1322
01:02:36,089 --> 01:02:31,589
drop syndrome that's how I call it

1323
01:02:39,180 --> 01:02:36,099
nourishment also the independent medical

1324
01:02:41,220 --> 01:02:39,190
assistance we should dissertation

1325
01:02:44,910 --> 01:02:41,230
actually might happen right now in both

1326
01:02:47,940 --> 01:02:44,920
the station for example an astronaut

1327
01:02:50,760 --> 01:02:47,950
rock remember might have a scratch get

1328
01:02:54,079 --> 01:02:50,770
injured on world and medical assistance

1329
01:02:57,470 --> 01:02:54,089
will be needed for him also a

1330
01:03:03,050 --> 01:02:57,480
psychological health radiation toxicity

1331
01:03:06,450 --> 01:03:03,060
other things connected to the toxic mel

1332
01:03:09,059 --> 01:03:06,460
lewis that are on board and of course a

1333
01:03:11,220 --> 01:03:09,069
microgravity affects all these risks

1334
01:03:14,309 --> 01:03:11,230
actually are quite well-known they are

1335
01:03:18,329 --> 01:03:14,319
already in test book textbooks on space

1336
01:03:21,329 --> 01:03:18,339
medicine motion policeman i think it's

1337
01:03:24,390 --> 01:03:21,339
very useful table very representative

1338
01:03:26,849 --> 01:03:24,400

maybe what is necessary to add to what

1339
01:03:29,960 --> 01:03:26,859
has been already said the district are

1340
01:03:36,380 --> 01:03:29,970
increasing with a year-long expedition

1341
01:03:40,559 --> 01:03:36,390
and of course Mars represents the most

1342
01:03:43,140 --> 01:03:40,569
high risks Mars is a red planet and all

1343
01:03:48,950 --> 01:03:43,150
red squares that we have in this table

1344
01:03:54,890 --> 01:03:52,950
cannot be evaluated for example like

1345
01:03:56,480 --> 01:03:54,900
sixty-five percent sometimes they are

1346
01:03:59,870 --> 01:03:56,490
alternative

1347
01:04:02,930 --> 01:03:59,880
they exist or they do not exist one for

1348
01:04:05,690 --> 01:04:02,940
example doctor thinks that this risk

1349
01:04:08,810 --> 01:04:05,700
exists and another doctor think that

1350
01:04:12,500 --> 01:04:08,820
this risk is non-existent so they are

1351
01:04:15,010 --> 01:04:12,510
not typically mathematical probability

1352
01:04:18,680 --> 01:04:15,020
figures unfortunately they are not

1353
01:04:21,320 --> 01:04:18,690
radiation yes we can apply some

1354
01:04:25,370 --> 01:04:21,330
probability characteristics to radiation

1355
01:04:29,390 --> 01:04:25,380
even to gas environment vibration and

1356
01:04:31,730 --> 01:04:29,400
noise also we can assess in probability

1357
01:04:33,830 --> 01:04:31,740
categories but as for some other risks

1358
01:04:38,120 --> 01:04:33,840
it is not possible sometimes it's very

1359
01:04:41,090 --> 01:04:38,130
hard to summarize and generalize this

1360
01:04:44,210 --> 01:04:41,100
Chris we have to study them separately

1361
01:04:46,130 --> 01:04:44,220
but the specialists who are very good

1362
01:04:48,560 --> 01:04:46,140
specialist in the area will study those

1363
01:04:51,650 --> 01:04:48,570

risks it was a complicated question

1364
01:04:53,540 --> 01:04:51,660
sorry for the long answer miskovsky come

1365
01:04:56,390 --> 01:04:53,550
someone is journalist asks sergei

1366
01:05:00,320 --> 01:04:56,400
krikalev so you've already told us that

1367
01:05:02,780 --> 01:05:00,330
you have year-long expedition experience

1368
01:05:08,150 --> 01:05:02,790
so what's the difference between the six

1369
01:05:10,700 --> 01:05:08,160
months flight and year long oh like a

1370
01:05:13,880 --> 01:05:10,710
lot of people think that the preparation

1371
01:05:17,150 --> 01:05:13,890
of cosmonauts actually you know comes to

1372
01:05:19,130 --> 01:05:17,160
running and to jump in and to you know

1373
01:05:22,760 --> 01:05:19,140
other physical things actually a lot of

1374
01:05:26,870 --> 01:05:22,770
training is done at the desk with tables

1375
01:05:31,160 --> 01:05:26,880
with diagrams and so the person who is

1376
01:05:33,140 --> 01:05:31,170
on board for a longer period of time is

1377
01:05:35,090 --> 01:05:33,150
in different conditions for example to

1378
01:05:38,240 --> 01:05:35,100
talk him out of were there for a year

1379
01:05:41,060 --> 01:05:38,250
and they were just two of them there

1380
01:05:43,640 --> 01:05:41,070
were some visitors of course to the

1381
01:05:48,170 --> 01:05:43,650
station valery polyakov came at the end

1382
01:05:50,660 --> 01:05:48,180
of the expedition but they had to know

1383
01:05:53,870 --> 01:05:50,670
all the systems really very subtly so

1384
01:05:56,840 --> 01:05:53,880
that in case of any fault of failure

1385
01:06:00,109 --> 01:05:56,850
they were had to be able to repair it

1386
01:06:02,859 --> 01:06:00,119
actually one year of light is not very

1387
01:06:05,150 --> 01:06:02,869
much different from six months light

1388
01:06:06,140 --> 01:06:05,160

seemed that the cruise line yet of

1389
01:06:09,170 --> 01:06:06,150
course

1390
01:06:13,779 --> 01:06:09,180
the crew members will have to have some

1391
01:06:16,460 --> 01:06:13,789
skills expedia scooter um in short

1392
01:06:19,039 --> 01:06:16,470
expeditions speed is a good of course we

1393
01:06:22,900 --> 01:06:19,049
also train skills but the expedition's

1394
01:06:28,370 --> 01:06:22,910
for six months the person should have

1395
01:06:31,250 --> 01:06:28,380
really very well trained as skills no

1396
01:06:33,190 --> 01:06:31,260
windshield so not much new is in the

1397
01:06:36,529 --> 01:06:33,200
preparation for the year-long expedition

1398
01:06:41,599 --> 01:06:36,539
that we do not apply to the six months

1399
01:06:43,700 --> 01:06:41,609
of flight complications will be that the

1400
01:06:46,490 --> 01:06:43,710
crew the complex issues will be

1401
01:06:51,200 --> 01:06:46,500
connected with the interaction with a

1402
01:06:53,870 --> 01:06:51,210
new crews that will come on board course

1403
01:06:57,289 --> 01:06:53,880
I users can be on the station only for a

1404
01:07:00,319 --> 01:06:57,299
certain amount of months and they we

1405
01:07:02,120 --> 01:07:00,329
have to rotate the vehicle so the crew

1406
01:07:05,029 --> 01:07:02,130
that is on board will have to adapt to

1407
01:07:08,890 --> 01:07:05,039
the newcomers but again I think it is

1408
01:07:11,960 --> 01:07:08,900
quite possible and we will have to train

1409
01:07:13,880 --> 01:07:11,970
you know the emergency situations in a

1410
01:07:17,329 --> 01:07:13,890
different configurations of the clothes

1411
01:07:19,819 --> 01:07:17,339
that will be very important of course so

1412
01:07:22,359 --> 01:07:19,829
in emergency situation all the actions

1413
01:07:26,750 --> 01:07:22,369

of the crew members should be very well

1414
01:07:28,400 --> 01:07:26,760
trained and very well learned okay will

1415
01:07:31,609 --> 01:07:28,410
be simulate any citations from the

1416
01:07:33,620 --> 01:07:31,619
flight to Mars believe the question when

1417
01:07:36,140 --> 01:07:33,630
we come closer to the flight to Mars

1418
01:07:38,029 --> 01:07:36,150
then we will probably have a chance to

1419
01:07:40,400 --> 01:07:38,039
simulate a some of the situation this

1420
01:07:45,769 --> 01:07:40,410
particular year-long expedition is not a

1421
01:07:47,269 --> 01:07:45,779
rehearsal for the Mars flight per se we

1422
01:07:50,779 --> 01:07:47,279
understand it will be a long duration

1423
01:07:53,000 --> 01:07:50,789
flight you know we are developing new

1424
01:07:55,250 --> 01:07:53,010
engines right now so the flight to Mars

1425
01:07:58,309 --> 01:07:55,260
might actually be shorter than we expect

1426
01:08:01,010 --> 01:07:58,319
right now no I mean maybe when you're

1427
01:08:02,960 --> 01:08:01,020
quitting wish more so the preparation

1428
01:08:04,849 --> 01:08:02,970
will have to be different as well you

1429
01:08:07,490 --> 01:08:04,859
push too much you know there is no sense

1430
01:08:14,029 --> 01:08:07,500
I think to do it for this year-long

1431
01:08:17,760 --> 01:08:16,019
okay that's going to finish up the

1432
01:08:19,379 --> 01:08:17,770
questions from Moscow and that's going

1433
01:08:20,700 --> 01:08:19,389
to conclude this briefing I apologize to

1434
01:08:23,099 --> 01:08:20,710
everybody on the phone lines who did not

1435
01:08:24,299 --> 01:08:23,109
get a chance to ask any questions but we

1436
01:08:25,289 --> 01:08:24,309
were out of time so if you'll stick

1437
01:08:27,359 --> 01:08:25,299
around we've got the crew news

1438
01:08:28,919 --> 01:08:27,369

conference coming up next and we will

1439
01:08:30,899 --> 01:08:28,929
attempt to get all the questions in

1440
01:08:32,189 --> 01:08:30,909
those for both Scott and Mikhail we want

1441
01:08:34,349 --> 01:08:32,199
to thank all of our panelists both here

1442
01:08:36,510 --> 01:08:34,359
in Houston and in Moscow and of course

1443
01:08:38,450 --> 01:08:36,520
for the latest on this one year crew you