1
00:00:09,110 --> 00:00:06,630
good morning and welcome to the orion

2
00:00:10,549 --> 00:00:09,120
multi-purpose crew vehicle demonstration

3
00:00:12,629 --> 00:00:10,559
here with me today to talk about the

4
00:00:15,430 --> 00:00:12,639
vehicle is lori garver

5
00:00:17,910 --> 00:00:15,440
nasa deputy administrator mark guyer

6
00:00:20,790 --> 00:00:17,920
orion multi-purpose crew vehicle program

7
00:00:22,710 --> 00:00:20,800
manager and larry price the orion deputy

8
00:00:24,150 --> 00:00:22,720
program manager for lockheed martin

9
00:00:26,310 --> 00:00:24,160
we'll have a brief overview and then

10
00:00:27,910 --> 00:00:26,320
we'll take questions lori

11
00:00:30,470 --> 00:00:27,920
thank you very much

12
00:00:31,830 --> 00:00:30,480
good morning everyone it is wonderful to

13
00:00:33,910 --> 00:00:31,840

have you here

14
00:00:36,709 --> 00:00:33,920
at the kennedy space center where we are

15
00:00:39,430 --> 00:00:36,719
honoring and celebrating over 30 years

16
00:00:42,229 --> 00:00:39,440
of a space shuttle program

17
00:00:45,510 --> 00:00:42,239
looking behind you we have

18
00:00:48,310 --> 00:00:45,520
in just uh hopefully 24 hours maybe a

19
00:00:50,709 --> 00:00:48,320
few more uh going to show the world just

20
00:00:52,630 --> 00:00:50,719
what it is that nasa has been doing on

21
00:00:56,790 --> 00:00:52,640
behalf of the american taxpayer for the

22
00:00:59,830 --> 00:00:56,800
last 30 years as we have uh carried

23
00:01:01,830 --> 00:00:59,840
unbelievable amounts of satellites

24
00:01:04,390 --> 00:01:01,840
spacecraft and ultimately building the

25
00:01:06,550 --> 00:01:04,400
space station to orbit using our

26
00:01:09,030 --> 00:01:06,560
wonderful space shuttle

27
00:01:12,149 --> 00:01:09,040
today we're here this morning to talk

28
00:01:14,950 --> 00:01:12,159
about the future and what we are doing

29
00:01:17,190 --> 00:01:14,960
at nasa when this amazing vehicle the

30
00:01:20,390 --> 00:01:17,200
space shuttle retires in just a few

31
00:01:23,990 --> 00:01:20,400
weeks i am standing in front of uh the

32
00:01:26,870 --> 00:01:24,000
test article of the orion mpc vehicle

33
00:01:29,109 --> 00:01:26,880
this vehicle is what is going to allow

34
00:01:31,910 --> 00:01:29,119
nasa on behalf of the american people

35
00:01:33,270 --> 00:01:31,920
and the world to explore again beyond

36
00:01:36,710 --> 00:01:33,280
low earth orbit

37
00:01:39,109 --> 00:01:36,720
this vehicle is a partnership nasa

38
00:01:41,670 --> 00:01:39,119

is working very closely with our

39
00:01:44,149 --> 00:01:41,680
industry team led by lockheed martin

40
00:01:45,830 --> 00:01:44,159
corporation we have

41
00:01:48,550 --> 00:01:45,840
just recently

42
00:01:50,389 --> 00:01:48,560
looked at the requirements that we have

43
00:01:53,590 --> 00:01:50,399
at nasa for this new program that

44
00:01:54,710 --> 00:01:53,600
president obama announced last year

45
00:02:01,749 --> 00:01:54,720
the

46
00:02:04,709 --> 00:02:01,759
agreed to by both members of congress

47
00:02:06,389 --> 00:02:04,719
bipartisan support for space exploration

48
00:02:08,389 --> 00:02:06,399
outlined that we would have a

49
00:02:11,350 --> 00:02:08,399
multi-purpose crew vehicle

50
00:02:14,229 --> 00:02:11,360
on top of a space launch system that

51
00:02:16,309 --> 00:02:14,239
will travel first to an asteroid with

52
00:02:18,790 --> 00:02:16,319
humans for the first time and beyond to

53
00:02:20,390 --> 00:02:18,800
mars in the mid 2030s

54
00:02:23,589 --> 00:02:20,400
the president spoke about these goals

55
00:02:26,710 --> 00:02:23,599
again just yesterday and it is with this

56
00:02:27,670 --> 00:02:26,720
vehicle that we intend to carry out that

57
00:02:29,830 --> 00:02:27,680
mission

58
00:02:32,309 --> 00:02:29,840
we have

59
00:02:34,070 --> 00:02:32,319
looked at as i said the requirements for

60
00:02:36,470 --> 00:02:34,080
those missions and found that they so

61
00:02:39,030 --> 00:02:36,480
well matched with the previous program

62
00:02:40,949 --> 00:02:39,040
of orion under the constellation system

63
00:02:42,630 --> 00:02:40,959

that we are going forward with this

64
00:02:46,869 --> 00:02:42,640
vehicle we

65
00:02:49,430 --> 00:02:46,879
look forward to very soon selecting the

66
00:02:50,390 --> 00:02:49,440
specific design for the space launch

67
00:02:51,270 --> 00:02:50,400
system

68
00:02:56,630 --> 00:02:51,280
and

69
00:02:58,550 --> 00:02:56,640
this era of exploration once again on

70
00:03:01,350 --> 00:02:58,560
behalf of the american people i want to

71
00:03:03,430 --> 00:03:01,360
first congratulate not only

72
00:03:06,790 --> 00:03:03,440
the nasa team but the lockheed team they

73
00:03:09,910 --> 00:03:06,800
have worked incredibly well this last

74
00:03:12,390 --> 00:03:09,920
more more than a year of transition we

75
00:03:15,350 --> 00:03:12,400
recognize that the team has found

76
00:03:16,710 --> 00:03:15,360
unbelievably creative ways to

77
00:03:19,990 --> 00:03:16,720
pull

78
00:03:22,550 --> 00:03:20,000
some of the systems that were required

79
00:03:24,949 --> 00:03:22,560
previously for consolation that are not

80
00:03:26,869 --> 00:03:24,959
for the new program we have streamlined

81
00:03:29,830 --> 00:03:26,879
activities they have gotten savings they

82
00:03:31,830 --> 00:03:29,840
can tell you more details about that but

83
00:03:34,550 --> 00:03:31,840
on behalf of charlie bolden the head of

84
00:03:37,670 --> 00:03:34,560
nasa and the whole nasa team we just

85
00:03:39,750 --> 00:03:37,680
could not be prouder of this program we

86
00:03:42,630 --> 00:03:39,760
believe that on behalf of the american

87
00:03:44,789 --> 00:03:42,640
people it is again time for nasa to do

88
00:03:47,350 --> 00:03:44,799

the hard thing to go beyond low earth

89
00:03:49,030 --> 00:03:47,360
orbit for over 50 years now we've been

90
00:03:51,830 --> 00:03:49,040
transporting people to and from low

91
00:03:53,990 --> 00:03:51,840
earth orbit we have a program commercial

92
00:03:57,270 --> 00:03:54,000
crew as you know that will be working

93
00:03:59,910 --> 00:03:57,280
with our industry partners to rely on

94
00:04:01,910 --> 00:03:59,920
them more to be contracting in new ways

95
00:04:04,949 --> 00:04:01,920
so that they can

96
00:04:07,190 --> 00:04:04,959
add their innovative spirit as

97
00:04:10,229 --> 00:04:07,200
lockheed has helped the government do

98
00:04:13,350 --> 00:04:10,239
with this program to truly truly be able

99
00:04:16,390 --> 00:04:13,360
to commercialize space and open up space

100
00:04:18,949 --> 00:04:16,400
for more people and activities as we

101
00:04:21,830 --> 00:04:18,959
lower the cost of getting to and from

102
00:04:24,230 --> 00:04:21,840
low earth orbit through this commercial

103
00:04:26,070 --> 00:04:24,240
cargo and crew program it will allow us

104
00:04:26,830 --> 00:04:26,080
to do these

105
00:04:28,390 --> 00:04:26,840
more

106
00:04:31,990 --> 00:04:28,400
far-reaching

107
00:04:34,230 --> 00:04:32,000
programs that nasa was established to do

108
00:04:35,590 --> 00:04:34,240
again we couldn't be prouder of the team

109
00:04:38,629 --> 00:04:35,600
i would

110
00:04:40,469 --> 00:04:38,639
like to pass this on for more details to

111
00:04:42,629 --> 00:04:40,479
our program manager of the orion

112
00:04:44,390 --> 00:04:42,639
multi-purpose crew vehicle team

113
00:04:45,510 --> 00:04:44,400

mark guyer thanks mark

114
00:04:48,150 --> 00:04:45,520
thank you laurie

115
00:04:51,270 --> 00:04:49,830
thanks everybody i appreciate everybody

116
00:04:52,550 --> 00:04:51,280
for showing up today gives us a chance

117
00:04:54,150 --> 00:04:52,560
to talk about the work that we're so

118
00:04:55,350 --> 00:04:54,160
excited about and talk about something

119
00:04:56,950 --> 00:04:55,360
that we think is very important for the

120
00:04:59,350 --> 00:04:56,960
united states

121
00:05:01,110 --> 00:04:59,360
the mpcb orion system is one of the key

122
00:05:02,230 --> 00:05:01,120
systems that can can keep the united

123
00:05:04,390 --> 00:05:02,240
states

124
00:05:06,390 --> 00:05:04,400
in front for exploration

125
00:05:08,230 --> 00:05:06,400
it's a system that

126
00:05:10,150 --> 00:05:08,240
houses the crew when we leave earth's

127
00:05:12,070 --> 00:05:10,160
atmosphere as well as translate to the

128
00:05:13,830 --> 00:05:12,080
beyond earth orbit destinations that

129
00:05:15,110 --> 00:05:13,840
we're talking about it also is the

130
00:05:17,430 --> 00:05:15,120
system that houses the crew when we

131
00:05:20,150 --> 00:05:17,440
return them safely uh to the surface of

132
00:05:22,710 --> 00:05:20,160
the planet uh the mpcb orion system

133
00:05:24,070 --> 00:05:22,720
enables uh us to return the crew safely

134
00:05:26,150 --> 00:05:24,080
during

135
00:05:27,830 --> 00:05:26,160
contingencies in any phase of the flight

136
00:05:29,670 --> 00:05:27,840
and return them back safely to us

137
00:05:31,830 --> 00:05:29,680
designed from the beginning for people

138
00:05:34,310 --> 00:05:31,840

designed from the beginning for safety

139
00:05:36,230 --> 00:05:34,320
it also is a highly capable system that

140
00:05:38,150 --> 00:05:36,240
provides the delta v and life support

141
00:05:39,670 --> 00:05:38,160
and extended duration that that fits in

142
00:05:41,110 --> 00:05:39,680
all the architectures that nasa's

143
00:05:42,469 --> 00:05:41,120
talking about and all the destinations

144
00:05:43,909 --> 00:05:42,479
that we're looking at so it's a highly

145
00:05:45,590 --> 00:05:43,919
capable system

146
00:05:47,590 --> 00:05:45,600
um it's in three

147
00:05:50,550 --> 00:05:47,600
there are three main pieces to the mpcb

148
00:05:52,870 --> 00:05:50,560
orion capsule system the first is the

149
00:05:54,150 --> 00:05:52,880
launch abort system uh that larry will

150
00:05:55,510 --> 00:05:54,160
talk a little bit about the tests that

151
00:05:57,510 --> 00:05:55,520
we've done on that system already it

152
00:05:59,590 --> 00:05:57,520
enables us to get the crew off in an

153
00:06:02,150 --> 00:05:59,600
emergency during the early phases of of

154
00:06:03,909 --> 00:06:02,160
ascent uh the crew crew module is

155
00:06:05,830 --> 00:06:03,919
actually obviously where the crew sits

156
00:06:07,270 --> 00:06:05,840
um it's where the crew has their living

157
00:06:09,189 --> 00:06:07,280
accommodations where they stole their

158
00:06:12,309 --> 00:06:09,199
stuff it's where they interface with the

159
00:06:14,550 --> 00:06:12,319
capsule systems it also uh has the seats

160
00:06:16,550 --> 00:06:14,560
and parachutes and tps that allows us to

161
00:06:19,510 --> 00:06:16,560
return them safely to the surface

162
00:06:21,749 --> 00:06:19,520
the service module provides the

163
00:06:23,510 --> 00:06:21,759

life support and propellant systems to

164
00:06:25,830 --> 00:06:23,520
go do those long duration missions as

165
00:06:28,070 --> 00:06:25,840
well as power generation and

166
00:06:29,830 --> 00:06:28,080
and the thermal systems

167
00:06:31,430 --> 00:06:29,840
it's lori mentioned

168
00:06:33,909 --> 00:06:31,440
everything this team has done it's a

169
00:06:35,510 --> 00:06:33,919
highly integrated team between nasa and

170
00:06:38,070 --> 00:06:35,520
lockheed and industry i think providing

171
00:06:40,390 --> 00:06:38,080
the best expertise from both to tackle

172
00:06:41,990 --> 00:06:40,400
this this difficult challenge

173
00:06:43,110 --> 00:06:42,000
and so i'd like to introduce larry he's

174
00:06:46,230 --> 00:06:43,120
going to give us give you a little bit

175
00:06:47,749 --> 00:06:46,240
background on the status of the program

176
00:06:48,550 --> 00:06:47,759
again thank you all for coming here this

177
00:06:50,790 --> 00:06:48,560
morning

178
00:06:52,469 --> 00:06:50,800
uh mark and mark and i our entire team

179
00:06:54,629 --> 00:06:52,479
so laurie are extremely excited about

180
00:06:57,110 --> 00:06:54,639
this program we have been working on it

181
00:06:59,430 --> 00:06:57,120
for some time and most recently refining

182
00:07:01,430 --> 00:06:59,440
the requirements as laurie mentioned and

183
00:07:02,550 --> 00:07:01,440
the concept functionality to meet those

184
00:07:04,309 --> 00:07:02,560
requirements

185
00:07:06,550 --> 00:07:04,319
and so we're finishing up the design and

186
00:07:08,629 --> 00:07:06,560
we're getting elements and tests now as

187
00:07:10,950 --> 00:07:08,639
mark mentioned we did last year test the

188
00:07:13,270 --> 00:07:10,960

launch abort system this is three solid

189
00:07:15,990 --> 00:07:13,280
rocket motors that control the

190
00:07:18,309 --> 00:07:16,000
separation of the crew system away from

191
00:07:19,909 --> 00:07:18,319
a catastrophe during ascent

192
00:07:22,070 --> 00:07:19,919
very significant

193
00:07:24,469 --> 00:07:22,080
because this vehicle will guide the

194
00:07:26,950 --> 00:07:24,479
guide the crew module directly off from

195
00:07:28,950 --> 00:07:26,960
the pad a mile up and a mile away and

196
00:07:31,110 --> 00:07:28,960
then return them on the parachutes and

197
00:07:33,749 --> 00:07:31,120
the descent system designed for return

198
00:07:36,070 --> 00:07:33,759
from far earth planets

199
00:07:38,870 --> 00:07:36,080
so that was successfully done last year

200
00:07:41,029 --> 00:07:38,880
we have the first uh crew module in

201
00:07:43,270 --> 00:07:41,039
acoustic test environmental test right

202
00:07:44,629 --> 00:07:43,280
now starting tests this month so that's

203
00:07:46,629 --> 00:07:44,639
the first spacecraft that's been

204
00:07:48,550 --> 00:07:46,639
fabricated to meet these requirements

205
00:07:50,230 --> 00:07:48,560
and the functionality and it will be

206
00:07:52,550 --> 00:07:50,240
going through a series of environmental

207
00:07:55,189 --> 00:07:52,560
tests to verify what the environments

208
00:07:56,790 --> 00:07:55,199
inside the vehicle are for the crew and

209
00:07:59,270 --> 00:07:56,800
all of the mechanical and electrical

210
00:08:00,469 --> 00:07:59,280
systems so we qualify them to the

211
00:08:02,710 --> 00:08:00,479
appropriate

212
00:08:04,950 --> 00:08:02,720
conditions but not over qualify them

213
00:08:06,390 --> 00:08:04,960

where they would get heavy or expensive

214
00:08:07,990 --> 00:08:06,400
so it's a significant development

215
00:08:10,150 --> 00:08:08,000
accomplishment that streamlines the

216
00:08:12,309 --> 00:08:10,160
process

217
00:08:13,670 --> 00:08:12,319
and we've also got with that the all of

218
00:08:15,990 --> 00:08:13,680
the designs have been coming together

219
00:08:18,629 --> 00:08:16,000
we've got the avionics system the power

220
00:08:20,390 --> 00:08:18,639
and communication hardware being

221
00:08:23,110 --> 00:08:20,400
assembled with the software operating

222
00:08:25,430 --> 00:08:23,120
systems and they are in in test today as

223
00:08:27,029 --> 00:08:25,440
well so now with these decisions coming

224
00:08:28,869 --> 00:08:27,039
to closure we've got all these other

225
00:08:30,950 --> 00:08:28,879
hardware designs coming together and

226
00:08:33,190 --> 00:08:30,960
test so that we'll be ready to meet the

227
00:08:35,269 --> 00:08:33,200
requirements of the nation and and we

228
00:08:37,350 --> 00:08:35,279
too are extremely proud and excited to

229
00:08:39,990 --> 00:08:37,360
be part of this collaborative team

230
00:08:42,709 --> 00:08:40,000
working with nasa we have over 70

231
00:08:45,190 --> 00:08:42,719
contractors five significant prime

232
00:08:46,949 --> 00:08:45,200
contractors and it's a relationship

233
00:08:49,269 --> 00:08:46,959
where frankly you can't tell who works

234
00:08:51,829 --> 00:08:49,279
for who whether it's a prime contract or

235
00:08:56,070 --> 00:08:51,839
a sub or nasa it is this team working

236
00:08:58,389 --> 00:08:56,790
all right

237
00:08:59,750 --> 00:08:58,399
we'll go ahead and take questions now

238
00:09:00,949 --> 00:08:59,760

please state your name and affiliation

239
00:09:01,670 --> 00:09:00,959
and who you're directing your question

240
00:09:05,670 --> 00:09:01,680
to

241
00:09:08,710 --> 00:09:05,680
i'll ask my question

242
00:09:11,350 --> 00:09:08,720
jonathan amos bbc news the europeans are

243
00:09:13,110 --> 00:09:11,360
coming to the end of their atv

244
00:09:15,350 --> 00:09:13,120
development they've got a i think three

245
00:09:16,550 --> 00:09:15,360
more vehicles to produce and then they

246
00:09:19,829 --> 00:09:16,560
want to do something else and they're

247
00:09:20,870 --> 00:09:19,839
very keen to get involved in mpcv orion

248
00:09:23,110 --> 00:09:20,880
i know you've had a couple of

249
00:09:25,590 --> 00:09:23,120
discussions with them about that what

250
00:09:28,949 --> 00:09:25,600
exactly could the europeans do to get

251
00:09:33,509 --> 00:09:30,790
okay

252
00:09:35,670 --> 00:09:33,519
so you know one of my jobs is to give my

253
00:09:36,949 --> 00:09:35,680
boss lots of options

254
00:09:39,350 --> 00:09:36,959
when we have a

255
00:09:40,790 --> 00:09:39,360
as laurie said the budget we need to be

256
00:09:42,389 --> 00:09:40,800
looking at smart ways of doing things

257
00:09:44,070 --> 00:09:42,399
being affordable and one one of the

258
00:09:47,590 --> 00:09:44,080
things is to look at other opportunities

259
00:09:49,430 --> 00:09:47,600
for people providing parts of the system

260
00:09:51,350 --> 00:09:49,440
esa obviously has capability they've

261
00:09:53,110 --> 00:09:51,360
done things on space station so we've

262
00:09:54,870 --> 00:09:53,120
had very early discussions i want to

263
00:09:57,110 --> 00:09:54,880

characterize that as

264
00:09:58,630 --> 00:09:57,120
it's one of the many things we look at

265
00:10:00,550 --> 00:09:58,640
to enable

266
00:10:02,069 --> 00:10:00,560
flying as early as possible and doing

267
00:10:03,430 --> 00:10:02,079
the most

268
00:10:05,350 --> 00:10:03,440
for this country so it's one of the

269
00:10:07,190 --> 00:10:05,360
things we're doing on they have some

270
00:10:08,630 --> 00:10:07,200
ideas on what they could provide and so

271
00:10:10,069 --> 00:10:08,640
we've had a couple of meetings about

272
00:10:11,829 --> 00:10:10,079
what the requirements might be and what

273
00:10:13,190 --> 00:10:11,839
the deal might look like so i would

274
00:10:15,670 --> 00:10:13,200
characterize it as very early

275
00:10:17,590 --> 00:10:15,680
discussions

276
00:10:19,190 --> 00:10:17,600
what sort of systems could they provide

277
00:10:21,190 --> 00:10:19,200
i mean well we know we know that they've

278
00:10:22,710 --> 00:10:21,200
you know you look at atv and hdb that

279
00:10:25,670 --> 00:10:22,720
have flown to space station they have

280
00:10:27,750 --> 00:10:25,680
propulsion guidance rendezvous docking

281
00:10:29,030 --> 00:10:27,760
uh consumables those kind of things they

282
00:10:30,470 --> 00:10:29,040
have a lot of experience in those

283
00:10:31,990 --> 00:10:30,480
systems

284
00:10:33,350 --> 00:10:32,000
and they've done things on space station

285
00:10:35,509 --> 00:10:33,360
computers and other things that were a

286
00:10:39,350 --> 00:10:35,519
big part of space station's success so

287
00:10:39,360 --> 00:10:43,829
they'd be very useful

288
00:10:43,839 --> 00:10:49,829

thank you

289
00:10:54,069 --> 00:10:52,230
from talking space uh

290
00:10:55,750 --> 00:10:54,079
the design of the vehicle is somewhat

291
00:10:57,590 --> 00:10:55,760
similar to the old apollo vehicle has

292
00:10:59,110 --> 00:10:57,600
any of that data has helped you guys out

293
00:11:00,470 --> 00:10:59,120
in the design of the vehicle and have

294
00:11:02,870 --> 00:11:00,480
you been collaborating with any of the

295
00:11:04,790 --> 00:11:02,880
apollo folks thank you absolutely

296
00:11:06,389 --> 00:11:04,800
absolutely so i think what we the key

297
00:11:07,990 --> 00:11:06,399
thing there is we take the best from

298
00:11:09,910 --> 00:11:08,000
what we've learned there and we add the

299
00:11:11,190 --> 00:11:09,920
newest technology and the new our newest

300
00:11:12,790 --> 00:11:11,200
experience all the things we've learned

301
00:11:14,630 --> 00:11:12,800
since apollo on shuttle and everything

302
00:11:16,470 --> 00:11:14,640
else and applied it to those systems a

303
00:11:19,350 --> 00:11:16,480
lot the physics hasn't changed since the

304
00:11:21,110 --> 00:11:19,360
60s so re-entry is the same so we use

305
00:11:22,470 --> 00:11:21,120
the the databases we've had before and

306
00:11:24,710 --> 00:11:22,480
the experience we had before in the

307
00:11:25,990 --> 00:11:24,720
design of both the shape and the

308
00:11:27,990 --> 00:11:26,000
thermal protection system are good

309
00:11:30,470 --> 00:11:28,000
examples

310
00:11:32,949 --> 00:11:30,480
thank you tarik malik with space.com um

311
00:11:35,750 --> 00:11:32,959
and i think mark for you um in the

312
00:11:37,430 --> 00:11:35,760
earlier orion uh i guess process you had

313
00:11:39,110 --> 00:11:37,440

two variants a four person and a sixth

314
00:11:40,470 --> 00:11:39,120
person uh depending on what you're going

315
00:11:42,389 --> 00:11:40,480
to use it for i'm just kind of curious

316
00:11:43,829 --> 00:11:42,399
which design then you're kind of leaning

317
00:11:45,990 --> 00:11:43,839
towards for a deep space would you want

318
00:11:46,949 --> 00:11:46,000
a four person like a more versatile

319
00:11:48,710 --> 00:11:46,959
craft

320
00:11:50,550 --> 00:11:48,720
you know what your your schedule might

321
00:11:52,310 --> 00:11:50,560
be in terms of having to down select

322
00:11:54,150 --> 00:11:52,320
that so that you can make it meet the

323
00:11:57,190 --> 00:11:54,160
space launch system requirements yeah

324
00:12:00,470 --> 00:11:57,200
great good question it's the same design

325
00:12:02,150 --> 00:12:00,480
the the this size this volume is what is

326
00:12:03,670 --> 00:12:02,160
required for a four person crew for

327
00:12:05,269 --> 00:12:03,680
those longer duration missions you know

328
00:12:08,470 --> 00:12:05,279
the longer you're in space together you

329
00:12:10,389 --> 00:12:08,480
need more room for stowing equipment for

330
00:12:13,350 --> 00:12:10,399
the bathroom frankly for other things

331
00:12:15,030 --> 00:12:13,360
and putting on and off ebay suits so you

332
00:12:16,790 --> 00:12:15,040
need more volume for the longer duration

333
00:12:18,470 --> 00:12:16,800
mission so this volume is appropriate

334
00:12:19,990 --> 00:12:18,480
for a four person mission

335
00:12:21,590 --> 00:12:20,000
if you wanted to though we don't have a

336
00:12:23,750 --> 00:12:21,600
mission for that if you wanted to do a

337
00:12:25,030 --> 00:12:23,760
much shorter duration you could fit more

338
00:12:29,110 --> 00:12:25,040

people into but right now we don't have

339
00:12:32,310 --> 00:12:31,110
seth bornstein associated press maybe

340
00:12:35,990 --> 00:12:32,320
for lori

341
00:12:39,190 --> 00:12:36,000
um the change from orion to mcpv

342
00:12:41,030 --> 00:12:39,200
mpcv can you tell us besides just the

343
00:12:44,389 --> 00:12:41,040
name

344
00:12:46,230 --> 00:12:44,399
what specifics did you change and why

345
00:12:48,310 --> 00:12:46,240
and the cost of it and especially the

346
00:12:49,990 --> 00:12:48,320
cost of just changing the name i mean

347
00:12:52,710 --> 00:12:50,000
how much are taxpayers paying because

348
00:12:55,910 --> 00:12:52,720
you're dumping orion for mpcv and how

349
00:12:58,710 --> 00:12:55,920
much are these overall changes costing

350
00:13:01,509 --> 00:12:58,720
i'll let mark follow up on the details

351
00:13:03,750 --> 00:13:01,519
or larry but overall i would say as i

352
00:13:06,790 --> 00:13:03,760
mentioned in my opening remarks that we

353
00:13:08,710 --> 00:13:06,800
looked at the alignment of the

354
00:13:10,790 --> 00:13:08,720
requirements for the previous program

355
00:13:12,870 --> 00:13:10,800
consolation and for our needs going

356
00:13:14,790 --> 00:13:12,880
forward and found that they were so well

357
00:13:16,310 --> 00:13:14,800
aligned that we ever chosen the vehicle

358
00:13:18,790 --> 00:13:16,320
uh it's interesting you pick on the name

359
00:13:21,350 --> 00:13:18,800
we i see everything says orion it's not

360
00:13:22,949 --> 00:13:21,360
clear to me that there just because it

361
00:13:25,350 --> 00:13:22,959
is a multi-purpose crew vehicle it

362
00:13:28,470 --> 00:13:25,360
always was a multi-purpose crew vehicle

363
00:13:31,509 --> 00:13:28,480

uh we will be looking i think as we

364
00:13:34,949 --> 00:13:31,519
transition to new programs what it is uh

365
00:13:37,430 --> 00:13:34,959
that will identify with this vast new

366
00:13:38,790 --> 00:13:37,440
exploration program we have but uh

367
00:13:41,030 --> 00:13:38,800
naming it's not really something that

368
00:13:43,829 --> 00:13:41,040
we've been hung up on in any way we're

369
00:13:45,750 --> 00:13:43,839
happy happy to be with the orion team

370
00:13:48,230 --> 00:13:45,760
here and uh

371
00:13:49,990 --> 00:13:48,240
just clarifying because the law the

372
00:13:51,430 --> 00:13:50,000
actual law said we would develop a

373
00:13:54,230 --> 00:13:51,440
multi-purpose crew vehicle i don't think

374
00:13:57,110 --> 00:13:54,240
the law meant to name something just to

375
00:13:58,310 --> 00:13:57,120
describe it and overall i would say

376
00:14:00,870 --> 00:13:58,320
while

377
00:14:02,230 --> 00:14:00,880
we have somewhat in my view granted i

378
00:14:04,069 --> 00:14:02,240
wasn't here at the time so i could be

379
00:14:05,990 --> 00:14:04,079
corrected gone back to the original

380
00:14:08,550 --> 00:14:06,000
purpose of orion orion's original

381
00:14:10,470 --> 00:14:08,560
purpose was for deep space exploration

382
00:14:13,350 --> 00:14:10,480
was not intended to go to the space

383
00:14:15,269 --> 00:14:13,360
station we had hoped to have uh the

384
00:14:17,030 --> 00:14:15,279
commercial vehicles more advanced at

385
00:14:19,430 --> 00:14:17,040
that time funding was not available we

386
00:14:22,389 --> 00:14:19,440
did not start funding the crew program

387
00:14:25,110 --> 00:14:22,399
yet and so orion was going to be making

388
00:14:28,310 --> 00:14:25,120

detour to the space station on its way

389
00:14:31,350 --> 00:14:28,320
it's it was set to do deep space and in

390
00:14:34,069 --> 00:14:31,360
fact much much overbuilt for the space

391
00:14:36,470 --> 00:14:34,079
station mission and overqualified

392
00:14:38,949 --> 00:14:36,480
and we certainly all uh recognize that

393
00:14:41,990 --> 00:14:38,959
if needed we would do that it is in the

394
00:14:43,590 --> 00:14:42,000
law that it is a backup but we really

395
00:14:45,750 --> 00:14:43,600
believe that if you are spending all

396
00:14:47,430 --> 00:14:45,760
your money doing that you are not going

397
00:14:49,990 --> 00:14:47,440
to be going further which is what the

398
00:14:51,670 --> 00:14:50,000
american taxpayer and the president have

399
00:14:55,189 --> 00:14:51,680
asked us to do

400
00:14:56,790 --> 00:14:55,199
so just in terms of the changes though

401
00:14:58,470 --> 00:14:56,800
so we

402
00:15:00,550 --> 00:14:58,480
you know i don't know that we've spent

403
00:15:01,590 --> 00:15:00,560
20 bucks on the name i think laura said

404
00:15:03,030 --> 00:15:01,600
it very well we're going to do that

405
00:15:04,310 --> 00:15:03,040
prudently we're going to make sure we're

406
00:15:06,550 --> 00:15:04,320
going to make sure we do what makes

407
00:15:08,230 --> 00:15:06,560
sense and we're we're using orion today

408
00:15:09,350 --> 00:15:08,240
we have not changed our documents and

409
00:15:10,790 --> 00:15:09,360
those kind of things we'll work with

410
00:15:12,629 --> 00:15:10,800
headquarters to see what makes sense but

411
00:15:14,550 --> 00:15:12,639
right now we haven't done that no reason

412
00:15:16,470 --> 00:15:14,560
to yet

413
00:15:18,470 --> 00:15:16,480

i think i think the key thing is what

414
00:15:20,629 --> 00:15:18,480
you said is we know we recognize the

415
00:15:22,069 --> 00:15:20,639
budget challenges these days and i think

416
00:15:24,310 --> 00:15:22,079
lori said it very well this team has

417
00:15:27,269 --> 00:15:24,320
done a great job i think of getting down

418
00:15:30,310 --> 00:15:27,279
to what is essential relative to design

419
00:15:32,310 --> 00:15:30,320
and test and fabrication uh on this

420
00:15:35,030 --> 00:15:32,320
vehicle and we've cut a lot of costs out

421
00:15:36,710 --> 00:15:35,040
overhead and other things to get down to

422
00:15:38,389 --> 00:15:36,720
i think provide the best capability for

423
00:15:39,590 --> 00:15:38,399
the country so that's what i focus on in

424
00:15:41,749 --> 00:15:39,600
the last few years we i think we've done

425
00:15:46,550 --> 00:15:41,759
a great job in concert with headquarters

426
00:15:51,110 --> 00:15:49,350
hey alex kurst nhk um so i heard you

427
00:15:52,710 --> 00:15:51,120
guys um talking a little bit before

428
00:15:54,949 --> 00:15:52,720
about safety safety is the name of the

429
00:15:57,829 --> 00:15:54,959
game certainly now can you tell us what

430
00:16:00,389 --> 00:15:57,839
if anything specifically encourages you

431
00:16:04,629 --> 00:16:00,399
about this vehicle vis-a-vis the space

432
00:16:09,350 --> 00:16:06,629
well let's see i'd say a couple things

433
00:16:10,949 --> 00:16:09,360
the mission itself

434
00:16:13,110 --> 00:16:10,959
given that we have the crew separate

435
00:16:14,870 --> 00:16:13,120
from the large cargo enables us to have

436
00:16:16,230 --> 00:16:14,880
an abort capability through all phases

437
00:16:18,069 --> 00:16:16,240
of flight i think that's a fundamental

438
00:16:19,749 --> 00:16:18,079

difference so that's why the launch

439
00:16:21,590 --> 00:16:19,759
abort system is so important during

440
00:16:22,949 --> 00:16:21,600
ascent

441
00:16:24,550 --> 00:16:22,959
we're going to have a great rocket i

442
00:16:26,790 --> 00:16:24,560
know but there there are still things

443
00:16:27,990 --> 00:16:26,800
that happen and even when those unlikely

444
00:16:29,269 --> 00:16:28,000
things happen we're going to be able to

445
00:16:31,430 --> 00:16:29,279
get the crew off and we showed that in

446
00:16:33,430 --> 00:16:31,440
the paddleboard one test that we have a

447
00:16:35,269 --> 00:16:33,440
highly capable system the other thing i

448
00:16:36,629 --> 00:16:35,279
think also that maybe people don't know

449
00:16:38,790 --> 00:16:36,639
is we have a capability contingency

450
00:16:41,509 --> 00:16:38,800
capability actually returned from these

451
00:16:43,189 --> 00:16:41,519
uh deep space missions even in even in a

452
00:16:46,710 --> 00:16:43,199
depressed condition where the cabin is

453
00:16:48,629 --> 00:16:46,720
depressed this system is built to return

454
00:16:49,910 --> 00:16:48,639
that crew over extended duration and get

455
00:16:51,189 --> 00:16:49,920
them back on the surface of their so

456
00:16:52,870 --> 00:16:51,199
there's things like that that we thought

457
00:16:54,230 --> 00:16:52,880
from the beginning through the whole

458
00:16:55,749 --> 00:16:54,240
mission of how to

459
00:16:57,110 --> 00:16:55,759
handle contingencies and get the crew

460
00:17:00,949 --> 00:16:57,120
safely back so i think those are some

461
00:17:04,549 --> 00:17:02,870
that might also contribute to it yeah so

462
00:17:06,630 --> 00:17:04,559
the question was simplicity of the craft

463
00:17:08,949 --> 00:17:06,640

so really from you know 100 years of

464
00:17:10,949 --> 00:17:08,959
flight 50 years of space we've been

465
00:17:13,189 --> 00:17:10,959
leveraging all of the lessons learned in

466
00:17:15,110 --> 00:17:13,199
space to apply it to the principal

467
00:17:17,669 --> 00:17:15,120
design to simplify the design so it

468
00:17:19,909 --> 00:17:17,679
would avoid those failure modes and then

469
00:17:21,429 --> 00:17:19,919
as mark is mentioning then we make those

470
00:17:24,549 --> 00:17:21,439
systems that you still have to have

471
00:17:26,789 --> 00:17:24,559
robust in addition to the obvious

472
00:17:29,270 --> 00:17:26,799
systems that that mark pointed out we've

473
00:17:31,190 --> 00:17:29,280
got a redundancy in other components and

474
00:17:33,190 --> 00:17:31,200
then even redundancy that's intended to

475
00:17:35,270 --> 00:17:33,200
be a different backup so we don't have

476
00:17:36,789 --> 00:17:35,280
what you call common mode failures so

477
00:17:39,190 --> 00:17:36,799
taking all the lessons learned from

478
00:17:40,950 --> 00:17:39,200
human space flight aircraft flight even

479
00:17:42,789 --> 00:17:40,960
nascar we participate in design of

480
00:17:45,190 --> 00:17:42,799
nascar race cars that can run into the

481
00:17:47,909 --> 00:17:45,200
wall at 200 miles an hour apply that to

482
00:17:50,310 --> 00:17:47,919
materials technology so when space

483
00:17:51,990 --> 00:17:50,320
program started nasa was was beginning

484
00:17:53,669 --> 00:17:52,000
all of this work now we've got the

485
00:17:55,350 --> 00:17:53,679
opportunity to leverage the rest of the

486
00:17:57,590 --> 00:17:55,360
industry and apply it back into the

487
00:17:59,430 --> 00:17:57,600
system so it's a collaboration of both

488
00:18:01,990 --> 00:17:59,440

the avionics system is a good example

489
00:18:03,830 --> 00:18:02,000
it's derived from

490
00:18:05,830 --> 00:18:03,840
computers that are flying airliners

491
00:18:08,710 --> 00:18:05,840
today so this is really the sixth

492
00:18:10,870 --> 00:18:08,720
generation of a fault tolerant hardware

493
00:18:12,789 --> 00:18:10,880
and software system that we're getting

494
00:18:14,789 --> 00:18:12,799
thousands of hours of test time every

495
00:18:16,789 --> 00:18:14,799
day that nasa is not paying for the

496
00:18:18,549 --> 00:18:16,799
commercial airlines are

497
00:18:20,230 --> 00:18:18,559
testing those systems for us all the

498
00:18:24,710 --> 00:18:20,240
time so we're leveraging all of those

499
00:18:28,630 --> 00:18:26,710
hi ken kramer for space flight magazine

500
00:18:30,390 --> 00:18:28,640
for nasa and lockheed can you talk about

501
00:18:32,070 --> 00:18:30,400
when you will launch humans into space

502
00:18:34,310 --> 00:18:32,080
and the flight test program leading up

503
00:18:35,909 --> 00:18:34,320
to that and when will nasa pick a rocket

504
00:18:37,990 --> 00:18:35,919
to do that flight test those initial

505
00:18:39,990 --> 00:18:38,000
flight tests which i think are in 2013.

506
00:18:42,710 --> 00:18:40,000
thank you

507
00:18:45,270 --> 00:18:42,720
well we uh as i said in the opening

508
00:18:47,909 --> 00:18:45,280
remarks are very close to selecting a

509
00:18:49,669 --> 00:18:47,919
specific design uh for the rocket and as

510
00:18:51,590 --> 00:18:49,679
we do that we will be laying out the

511
00:18:53,669 --> 00:18:51,600
test flight program this is a

512
00:18:55,110 --> 00:18:53,679
constrained budget environment however

513
00:18:56,630 --> 00:18:55,120

and some of the test flight dates that

514
00:18:58,470 --> 00:18:56,640
you mentioned are

515
00:19:02,150 --> 00:18:58,480
things that would have been

516
00:19:04,150 --> 00:19:02,160
possible on the authorization levels

517
00:19:06,549 --> 00:19:04,160
that are significantly higher than both

518
00:19:08,070 --> 00:19:06,559
what we received for 11 and not only

519
00:19:09,590 --> 00:19:08,080
what our request is for 12 but what the

520
00:19:11,430 --> 00:19:09,600
appropriators have just outlined at

521
00:19:13,830 --> 00:19:11,440
least in the house would be

522
00:19:16,310 --> 00:19:13,840
for 12. so those test flights

523
00:19:20,470 --> 00:19:16,320
we are looking at now what that schedule

524
00:19:21,990 --> 00:19:20,480
would be and hoping to be able to

525
00:19:24,710 --> 00:19:22,000
make our final determination on the

526
00:19:28,549 --> 00:19:24,720
designs and get it announced on the sls

527
00:19:31,830 --> 00:19:30,230
frank mooring with aviation week just to

528
00:19:36,150 --> 00:19:31,840
follow up lori does that mean that

529
00:19:41,190 --> 00:19:38,470
another launch vehicle besides sls have

530
00:19:43,590 --> 00:19:41,200
you made that decision

531
00:19:45,830 --> 00:19:43,600
the program has made uh recommendations

532
00:19:47,830 --> 00:19:45,840
about that i think until our final

533
00:19:49,750 --> 00:19:47,840
vehicles are selected unless i'm wrong

534
00:19:51,750 --> 00:19:49,760
we aren't ready to announce those

535
00:19:54,070 --> 00:19:51,760
decisions but the constrained fiscal

536
00:19:56,390 --> 00:19:54,080
environment does cause us to really look

537
00:19:57,669 --> 00:19:56,400
at test flights and then of course also

538
00:19:59,909 --> 00:19:57,679

with what

539
00:20:01,190 --> 00:19:59,919
we choose for the sls will depend if

540
00:20:03,190 --> 00:20:01,200
there are things that are more readily

541
00:20:05,909 --> 00:20:03,200
available and those would work

542
00:20:08,630 --> 00:20:05,919
in a way that would not only then test

543
00:20:11,750 --> 00:20:08,640
the crew vehicle but part of the rocket

544
00:20:14,149 --> 00:20:11,760
as well that would clearly possibly be a

545
00:20:17,029 --> 00:20:14,159
more efficient way to do it where is the

546
00:20:19,669 --> 00:20:17,039
sls decision at this point

547
00:20:21,350 --> 00:20:19,679
the sls decision we are looking at all

548
00:20:23,270 --> 00:20:21,360
the cost evaluation we have an

549
00:20:23,990 --> 00:20:23,280
independent cost evaluation coming

550
00:20:25,270 --> 00:20:24,000
through

551
00:20:26,950 --> 00:20:25,280
and uh

552
00:20:37,669 --> 00:20:26,960
we still hope to be able to announce i

553
00:20:42,549 --> 00:20:39,110
jim siegel with the celebration

554
00:20:44,870 --> 00:20:42,559
independent newspaper um there are

555
00:20:47,110 --> 00:20:44,880
you mentioned earlier lori about the

556
00:20:49,830 --> 00:20:47,120
constrained budget situation that the

557
00:20:50,870 --> 00:20:49,840
country faces right now so how would you

558
00:20:51,990 --> 00:20:50,880
answer

559
00:20:53,430 --> 00:20:52,000
those who

560
00:20:56,549 --> 00:20:53,440
would question

561
00:20:59,830 --> 00:20:56,559
why should we be spending uh this money

562
00:21:02,549 --> 00:20:59,840
today for deep deep space exploration i

563
00:21:05,110 --> 00:21:02,559

mean besides just being first what's in

564
00:21:06,710 --> 00:21:05,120
it for the taxpayer thank you

565
00:21:08,710 --> 00:21:06,720
i guess i challenge

566
00:21:10,789 --> 00:21:08,720
folks who believe that we shouldn't be

567
00:21:12,470 --> 00:21:10,799
spending money on space to recognize

568
00:21:15,909 --> 00:21:12,480
that all this money is spent here on

569
00:21:18,149 --> 00:21:15,919
earth that every penny of the taxpayers

570
00:21:20,310 --> 00:21:18,159
dollars that has been spent toward nasa

571
00:21:21,830 --> 00:21:20,320
and these unbelievable programs has gone

572
00:21:24,789 --> 00:21:21,840
to

573
00:21:26,310 --> 00:21:24,799
jobs in this country folks who have

574
00:21:28,710 --> 00:21:26,320
developed technologies who have then

575
00:21:30,789 --> 00:21:28,720
come off and developed new markets

576
00:21:32,630 --> 00:21:30,799
and created even more jobs to help our

577
00:21:35,029 --> 00:21:32,640
economic growth aerospace industry is

578
00:21:37,510 --> 00:21:35,039
still one of the last remaining export

579
00:21:39,750 --> 00:21:37,520
industries in this nation that has

580
00:21:42,630 --> 00:21:39,760
created unbelievable

581
00:21:44,950 --> 00:21:42,640
wealth and growth for our country

582
00:21:48,390 --> 00:21:44,960
in addition the leadership of great

583
00:21:50,549 --> 00:21:48,400
nations explore this is what we do as a

584
00:21:53,669 --> 00:21:50,559
nation we in the united states are

585
00:21:55,510 --> 00:21:53,679
explorers we can't wait to get back to

586
00:21:57,430 --> 00:21:55,520
exploration beyond low earth orbit but i

587
00:21:59,350 --> 00:21:57,440
would challenge you to say that we are

588
00:22:01,190 --> 00:21:59,360

exploring on the international space

589
00:22:04,470 --> 00:22:01,200
station the space shuttle has been an

590
00:22:06,470 --> 00:22:04,480
exploring vehicle it's a little tough to

591
00:22:08,390 --> 00:22:06,480
have people believe we're trapped in low

592
00:22:10,230 --> 00:22:08,400
earth orbit when we realize how amazing

593
00:22:12,070 --> 00:22:10,240
it is to be able to get there with this

594
00:22:13,990 --> 00:22:12,080
vehicle that we will hopefully be

595
00:22:17,029 --> 00:22:14,000
launching tomorrow the international

596
00:22:20,390 --> 00:22:17,039
space station is developing not only the

597
00:22:23,430 --> 00:22:20,400
types of technologies and information we

598
00:22:25,270 --> 00:22:23,440
need for nasa to go further we are

599
00:22:27,590 --> 00:22:25,280
developing technologies that are used

600
00:22:29,510 --> 00:22:27,600
right here on planet earth through

601
00:22:32,630 --> 00:22:29,520
medical technologies

602
00:22:34,630 --> 00:22:32,640
materials we we have made advancements

603
00:22:36,710 --> 00:22:34,640
in uh computer technology

604
00:22:38,630 --> 00:22:36,720
miniaturization from the space program

605
00:22:41,430 --> 00:22:38,640
that has led to

606
00:22:42,950 --> 00:22:41,440
the innovation that has made this

607
00:22:46,789 --> 00:22:42,960
country great

608
00:22:48,950 --> 00:22:46,799
nasa is that very very small part of the

609
00:22:51,590 --> 00:22:48,960
government funding that is an investment

610
00:22:53,270 --> 00:22:51,600
in our future and through developments

611
00:22:55,669 --> 00:22:53,280
in aeronautics

612
00:22:57,029 --> 00:22:55,679
earth sciences the ability to have

613
00:22:58,390 --> 00:22:57,039

satellites that are going to help us

614
00:23:00,630 --> 00:22:58,400
determine

615
00:23:01,990 --> 00:23:00,640
what it is in store for our planet in

616
00:23:03,669 --> 00:23:02,000
the future

617
00:23:05,510 --> 00:23:03,679
you cannot put a price on that and i

618
00:23:08,149 --> 00:23:05,520
can't complete my answer without talking

619
00:23:09,750 --> 00:23:08,159
about the fact that nasa was born of the

620
00:23:13,830 --> 00:23:09,760
cold war

621
00:23:14,870 --> 00:23:13,840
has opened up the world for this

622
00:23:17,029 --> 00:23:14,880
peaceful

623
00:23:19,029 --> 00:23:17,039
cooperative relationship we have with

624
00:23:21,350 --> 00:23:19,039
the former soviet union

625
00:23:23,830 --> 00:23:21,360
while we don't want to count on the

626
00:23:25,830 --> 00:23:23,840
soyuz the russian vehicle for our

627
00:23:27,669 --> 00:23:25,840
transportation services any longer than

628
00:23:28,789 --> 00:23:27,679
we have to the fact that we have this

629
00:23:30,710 --> 00:23:28,799
partnership

630
00:23:32,549 --> 00:23:30,720
with russia that has allowed us to work

631
00:23:34,390 --> 00:23:32,559
together peacefully

632
00:23:37,430 --> 00:23:34,400
how can you put a price tag on that that

633
00:23:39,590 --> 00:23:37,440
is what nasa has given to the world and

634
00:23:42,070 --> 00:23:39,600
it's a privilege to be part of the group

635
00:23:44,630 --> 00:23:42,080
that has done it and uh while we spent

636
00:23:46,950 --> 00:23:44,640
four percent of the budget during apollo

637
00:23:47,830 --> 00:23:46,960
we do it for less than half a percent

638
00:23:49,430 --> 00:23:47,840

now

639
00:23:51,909 --> 00:23:49,440
and uh

640
00:23:55,510 --> 00:23:51,919
the men and women of

641
00:23:58,470 --> 00:23:55,520
nasa the contractor team university team

642
00:24:00,390 --> 00:23:58,480
have been doing this so that we our

643
00:24:03,029 --> 00:24:00,400
children our grandchildren can have a

644
00:24:04,950 --> 00:24:03,039
better future it's nothing short of in

645
00:24:07,590 --> 00:24:04,960
my view the very best

646
00:24:08,710 --> 00:24:07,600
investment that the taxpayer makes uh in

647
00:24:12,470 --> 00:24:08,720
the

648
00:24:14,789 --> 00:24:12,480
can i try to add just a little bit lori

649
00:24:16,230 --> 00:24:14,799
so so we do this because we're engineers

650
00:24:18,710 --> 00:24:16,240
and we love building these marvelous

651
00:24:20,789 --> 00:24:18,720
machines and the people we deal with but

652
00:24:22,549 --> 00:24:20,799
the flight test article we transported

653
00:24:24,390 --> 00:24:22,559
from california recently so we can use

654
00:24:26,710 --> 00:24:24,400
it in production pathfinder testing

655
00:24:28,710 --> 00:24:26,720
today but we had the opportunity to make

656
00:24:30,950 --> 00:24:28,720
a few stops across the country and i

657
00:24:33,029 --> 00:24:30,960
participated in the stop in austin and

658
00:24:34,789 --> 00:24:33,039
in two days they had 10 000 people just

659
00:24:36,630 --> 00:24:34,799
stopped by the vehicle in austin they

660
00:24:38,230 --> 00:24:36,640
just wanted to touch it they just wanted

661
00:24:39,909 --> 00:24:38,240
to hear that we were doing so that we

662
00:24:42,710 --> 00:24:39,919
were doing this as a country going on

663
00:24:44,149 --> 00:24:42,720

and exploring and and they had no vested

664
00:24:45,909 --> 00:24:44,159
interest right in austin they were just

665
00:24:48,070 --> 00:24:45,919
excited about it so i think the

666
00:24:49,590 --> 00:24:48,080
grassroots everyone we talk to children

667
00:24:51,669 --> 00:24:49,600
youth that are excited about being

668
00:24:53,909 --> 00:24:51,679
astronauts are coming up to us every day

669
00:24:55,830 --> 00:24:53,919
and want to participate nasa has high

670
00:24:57,669 --> 00:24:55,840
school interns that are participating in

671
00:24:59,590 --> 00:24:57,679
this program that are excited they

672
00:25:01,830 --> 00:24:59,600
participated in the rendezvous and

673
00:25:03,350 --> 00:25:01,840
proxop demo on the last shuttle flight

674
00:25:05,669 --> 00:25:03,360
high school kids that are sitting on

675
00:25:07,669 --> 00:25:05,679
console during the summer and the

676
00:25:09,830 --> 00:25:07,679
congress you all know is very supportive

677
00:25:12,149 --> 00:25:09,840
of it yes it's expensive yes the economy

678
00:25:13,830 --> 00:25:12,159
is tight but the spin-offs and the

679
00:25:16,549 --> 00:25:13,840
inspiration that this creates is

680
00:25:16,559 --> 00:25:21,590
any more questions

681
00:25:26,070 --> 00:25:24,950
yeah hi mike wahl from space.com um so

682
00:25:27,269 --> 00:25:26,080
yeah people

683
00:25:29,190 --> 00:25:27,279
people are used to seeing the space

684
00:25:30,950 --> 00:25:29,200
shuttle as sort of i mean our iconic

685
00:25:32,630 --> 00:25:30,960
space vehicle for this country and this

686
00:25:33,909 --> 00:25:32,640
i mean it looks back like it like it

687
00:25:36,230 --> 00:25:33,919
seems like we're sort of going back in

688
00:25:38,470 --> 00:25:36,240

time with this design and so

689
00:25:40,310 --> 00:25:38,480
yes what would you say to folks who who

690
00:25:42,549 --> 00:25:40,320
would say well this this looks like old

691
00:25:44,149 --> 00:25:42,559
technology it looks like i know 60s era

692
00:25:47,029 --> 00:25:44,159
technology how has it sort of been

693
00:25:49,269 --> 00:25:47,039
adapted for the 21st century and also do

694
00:25:50,789 --> 00:25:49,279
you guys have any plans to to sort of

695
00:25:53,269 --> 00:25:50,799
give this

696
00:25:55,110 --> 00:25:53,279
like could actually land on an asteroid

697
00:25:56,870 --> 00:25:55,120
this vehicle or i mean do you have any

698
00:25:58,950 --> 00:25:56,880
plans to actually put that capability in

699
00:26:01,990 --> 00:25:58,960
some time

700
00:26:03,830 --> 00:26:02,000
yeah so i think you know part of it is

701
00:26:05,990 --> 00:26:03,840
again the physics doesn't change so you

702
00:26:07,669 --> 00:26:06,000
have to look beyond the shape

703
00:26:09,350 --> 00:26:07,679
to understand the technology that's in

704
00:26:11,990 --> 00:26:09,360
this vehicle so as larry mentioned

705
00:26:13,269 --> 00:26:12,000
before we've used the state of the art

706
00:26:14,710 --> 00:26:13,279
in other industries so we're not

707
00:26:16,390 --> 00:26:14,720
starting from the beginning and then

708
00:26:18,470 --> 00:26:16,400
accelerated it and added the

709
00:26:19,990 --> 00:26:18,480
capabilities we need to do this deep

710
00:26:22,470 --> 00:26:20,000
space mission so it is advanced

711
00:26:24,149 --> 00:26:22,480
technology for the for the thermal

712
00:26:27,110 --> 00:26:24,159
protection system the launch abort

713
00:26:28,789 --> 00:26:27,120

system the avionics uh all the life

714
00:26:30,710 --> 00:26:28,799
support systems that are part of keeping

715
00:26:32,310 --> 00:26:30,720
the crew alive are not systems that we

716
00:26:33,669 --> 00:26:32,320
pulled from apollo obviously right this

717
00:26:35,990 --> 00:26:33,679
is stuff we've learned from apollo

718
00:26:37,430 --> 00:26:36,000
advanced in both other industries as

719
00:26:38,549 --> 00:26:37,440
well as the shuttle and now apply to

720
00:26:39,669 --> 00:26:38,559
this system

721
00:26:41,990 --> 00:26:39,679
um

722
00:26:43,830 --> 00:26:42,000
as far as the the the neo missions there

723
00:26:45,350 --> 00:26:43,840
are other capabilities you could do as

724
00:26:46,470 --> 00:26:45,360
we get close to the neos there's a

725
00:26:47,750 --> 00:26:46,480
couple ways where you could actually get

726
00:26:50,549 --> 00:26:47,760
to the surface

727
00:26:52,950 --> 00:26:50,559
evas or another vehicle that would allow

728
00:26:54,789 --> 00:26:52,960
the crew to descend down to the surface

729
00:26:57,110 --> 00:26:54,799
you wouldn't actually dock

730
00:26:58,470 --> 00:26:57,120
with this particular vehicle

731
00:26:59,830 --> 00:26:58,480
but this gets them there and allows them

732
00:27:02,390 --> 00:26:59,840
to get home

733
00:27:04,390 --> 00:27:02,400
i'll mention uh the iconic image of the

734
00:27:06,950 --> 00:27:04,400
space shuttle and i do believe it is

735
00:27:09,430 --> 00:27:06,960
something that the public has related to

736
00:27:11,110 --> 00:27:09,440
similar to sort of that footprint on the

737
00:27:13,510 --> 00:27:11,120
moon and

738
00:27:15,029 --> 00:27:13,520

we'll have flying vehicles with wings in

739
00:27:17,510 --> 00:27:15,039
the future we'll have footprints on the

740
00:27:19,350 --> 00:27:17,520
moon in the future but this is using

741
00:27:21,909 --> 00:27:19,360
what we've learned one of the earlier

742
00:27:24,230 --> 00:27:21,919
responses to the question about why

743
00:27:25,750 --> 00:27:24,240
this vehicle is safer and why we're more

744
00:27:27,350 --> 00:27:25,760
comfortable with it than the space

745
00:27:28,710 --> 00:27:27,360
shuttle is you know apollo was the way

746
00:27:30,789 --> 00:27:28,720
it was for a reason this is going into

747
00:27:32,870 --> 00:27:30,799
deep space the shuttle could not do that

748
00:27:35,909 --> 00:27:32,880
and in fact the

749
00:27:37,909 --> 00:27:35,919
possibilities of being able to escape at

750
00:27:39,669 --> 00:27:37,919
any moment are something that we just

751
00:27:42,470 --> 00:27:39,679
need to require we learn

752
00:27:44,389 --> 00:27:42,480
that we shouldn't be carrying the large

753
00:27:45,990 --> 00:27:44,399
payloads with the crew as was a cave

754
00:27:48,070 --> 00:27:46,000
recommendation these are things we put

755
00:27:50,630 --> 00:27:48,080
into place so yes we will always have

756
00:27:52,630 --> 00:27:50,640
the shuttle iconic image we we really

757
00:27:54,789 --> 00:27:52,640
need to recognize the space station as

758
00:27:56,549 --> 00:27:54,799
an iconic image i know we don't see it

759
00:27:58,630 --> 00:27:56,559
physically as

760
00:28:01,029 --> 00:27:58,640
it launches and lands

761
00:28:03,590 --> 00:28:01,039
as it did that in pieces but i don't

762
00:28:06,710 --> 00:28:03,600
know i assume all of you like like me do

763
00:28:08,630 --> 00:28:06,720

track it and go overnight and see that

764
00:28:09,750 --> 00:28:08,640
beautiful bright object in the sky go

765
00:28:11,830 --> 00:28:09,760
overhead

766
00:28:14,149 --> 00:28:11,840
and recognize we have women and men

767
00:28:16,470 --> 00:28:14,159
living in space permanently we are space

768
00:28:18,149 --> 00:28:16,480
faring civilization and

769
00:28:22,710 --> 00:28:18,159
with this vehicle it is going to allow

770
00:28:25,750 --> 00:28:24,230
i'm waiting

771
00:28:29,909 --> 00:28:25,760
i'm bill cap

772
00:28:31,669 --> 00:28:29,919
from wwl tv in new orleans and

773
00:28:33,190 --> 00:28:31,679
my guys had a little trouble getting in

774
00:28:34,710 --> 00:28:33,200
position i'm waiting for a second for

775
00:28:38,389 --> 00:28:34,720
him to get in position that of course is

776
00:28:43,510 --> 00:28:39,990
there we go this new orleans is where

777
00:28:45,990 --> 00:28:43,520
the external tanks have been built

778
00:28:48,070 --> 00:28:46,000
and there's a lot of uh angst and

779
00:28:50,230 --> 00:28:48,080
concern in new orleans about what the

780
00:28:52,950 --> 00:28:50,240
future of space flight is we've run into

781
00:28:55,350 --> 00:28:52,960
people here uh who helped build those

782
00:28:58,789 --> 00:28:55,360
tanks who are very worried because he's

783
00:29:02,710 --> 00:29:00,549
they're very worried about what the next

784
00:29:04,470 --> 00:29:02,720
step will be and whether new orleans

785
00:29:07,909 --> 00:29:04,480
will have a role

786
00:29:09,909 --> 00:29:07,919
in that so so what can you tell the

787
00:29:11,750 --> 00:29:09,919
people of new orleans about what their

788
00:29:13,990 --> 00:29:11,760

future might be

789
00:29:17,430 --> 00:29:14,000
in the space

790
00:29:19,269 --> 00:29:17,440
exploration race

791
00:29:22,149 --> 00:29:19,279
the women and men who have worked on the

792
00:29:23,350 --> 00:29:22,159
space shuttle program in new orleans in

793
00:29:26,230 --> 00:29:23,360
houston

794
00:29:27,909 --> 00:29:26,240
in cocoa beach and titusville area have

795
00:29:29,669 --> 00:29:27,919
put their hearts and soul into a vehicle

796
00:29:31,510 --> 00:29:29,679
and should be nothing but proud of the

797
00:29:32,389 --> 00:29:31,520
accomplishment we

798
00:29:34,950 --> 00:29:32,399
plan

799
00:29:36,710 --> 00:29:34,960
a very robust future for

800
00:29:38,470 --> 00:29:36,720
not only human space flight but nasa

801
00:29:41,590 --> 00:29:38,480
generally that will take all the

802
00:29:44,230 --> 00:29:41,600
contributions of these people investing

803
00:29:45,909 --> 00:29:44,240
in those technologies and those programs

804
00:29:47,990 --> 00:29:45,919
that can help lower the cost and be more

805
00:29:50,630 --> 00:29:48,000
efficient are what are going to continue

806
00:29:53,510 --> 00:29:50,640
to create more jobs and keep aerospace

807
00:29:55,830 --> 00:29:53,520
industry on the cutting edge to keep us

808
00:29:57,830 --> 00:29:55,840
from just having only government-funded

809
00:30:01,269 --> 00:29:57,840
programs that we know are not only

810
00:30:03,750 --> 00:30:01,279
limited but maybe not even growing

811
00:30:07,029 --> 00:30:03,760
as of course we would all hope

812
00:30:08,230 --> 00:30:07,039
we absolutely recognize that

813
00:30:11,350 --> 00:30:08,240

shoot

814
00:30:14,310 --> 00:30:11,360
capabilities across the country have uh

815
00:30:15,990 --> 00:30:14,320
unique aspects of them that we want to

816
00:30:18,470 --> 00:30:16,000
take advantage of the future programs

817
00:30:20,549 --> 00:30:18,480
whether there are aspects of the sls

818
00:30:21,430 --> 00:30:20,559
that will do that specifically in in new

819
00:30:23,510 --> 00:30:21,440
orleans

820
00:30:25,590 --> 00:30:23,520
future commercial vehicles i know are

821
00:30:26,870 --> 00:30:25,600
looking at the facility

822
00:30:29,909 --> 00:30:26,880
those are all

823
00:30:32,310 --> 00:30:29,919
potential for that facility but i guess

824
00:30:34,070 --> 00:30:32,320
i would also just add i mean we know we

825
00:30:35,750 --> 00:30:34,080
owe what we have with the shuttle

826
00:30:38,470 --> 00:30:35,760
program to

827
00:30:41,029 --> 00:30:38,480
the folks at michoud

828
00:30:43,510 --> 00:30:41,039
never forget those uh people who wrote

829
00:30:44,950 --> 00:30:43,520
out the hurricane and literally saved

830
00:30:46,630 --> 00:30:44,960
the space station

831
00:30:48,470 --> 00:30:46,640
space shuttle the human space flight

832
00:30:50,950 --> 00:30:48,480
program and have allowed us to do all

833
00:30:52,630 --> 00:30:50,960
this i have a son who's spent his first

834
00:30:54,789 --> 00:30:52,640
year in college and i know people feel

835
00:30:56,710 --> 00:30:54,799
like the shuttles are like children and

836
00:30:58,950 --> 00:30:56,720
it's hard when they go away and you feel

837
00:31:00,710 --> 00:30:58,960
a little sad at first and

838
00:31:02,470 --> 00:31:00,720

some days you're a little relieved and

839
00:31:03,830 --> 00:31:02,480
they made it and you're proud mainly

840
00:31:05,350 --> 00:31:03,840
you're proud and that's what people

841
00:31:07,590 --> 00:31:05,360
should feel about this program and

842
00:31:10,149 --> 00:31:07,600
recognize that uh by their achievements

843
00:31:11,509 --> 00:31:10,159
they're going to allow us to do even

844
00:31:13,350 --> 00:31:11,519
more and we want all of their

845
00:31:15,029 --> 00:31:13,360
participation

846
00:31:17,909 --> 00:31:15,039
you can come visit them and we'll get

847
00:31:20,389 --> 00:31:17,919
you a nice oyster pull boy or crawfish

848
00:31:22,870 --> 00:31:20,399
uh jambalaya

849
00:31:24,549 --> 00:31:22,880
we do uh of course we do weld the orion

850
00:31:25,990 --> 00:31:24,559
system michoud and we take the

851
00:31:27,590 --> 00:31:26,000
experience we got a lot of experienced

852
00:31:29,830 --> 00:31:27,600
people from et that were applied to that

853
00:31:33,750 --> 00:31:29,840
job so they're a key part of our

854
00:31:33,760 --> 00:31:36,549
i'm sorry

855
00:31:39,830 --> 00:31:38,389
frank mooring with aviation we got lori

856
00:31:42,389 --> 00:31:39,840
i just want to follow up a little bit

857
00:31:44,870 --> 00:31:42,399
about your answer on the sls system you

858
00:31:46,070 --> 00:31:44,880
said by the end of the summer um

859
00:31:47,990 --> 00:31:46,080
you know you're under a certain amount

860
00:31:50,630 --> 00:31:48,000
of pressure from congress to

861
00:31:51,909 --> 00:31:50,640
to have produced that already um and

862
00:31:53,590 --> 00:31:51,919
it's also my understanding that the

863
00:31:55,669 --> 00:31:53,600

administrator has picked a reference

864
00:31:57,590 --> 00:31:55,679
designed for the vehicle and forwarded

865
00:31:59,750 --> 00:31:57,600
it to the white house for uh

866
00:32:01,029 --> 00:31:59,760
consideration so could you maybe break

867
00:32:03,830 --> 00:32:01,039
it out a little bit more about where

868
00:32:05,350 --> 00:32:03,840
that decision is and exactly when

869
00:32:07,590 --> 00:32:05,360
or at least a little bit more precisely

870
00:32:09,110 --> 00:32:07,600
when we can expect to see it

871
00:32:09,990 --> 00:32:09,120
well we actually picked a reference

872
00:32:11,350 --> 00:32:10,000
design

873
00:32:14,070 --> 00:32:11,360
vehicle i think as you know in the

874
00:32:17,110 --> 00:32:14,080
report to congress in january we have

875
00:32:19,110 --> 00:32:17,120
been working to respond to

876
00:32:21,269 --> 00:32:19,120
this final uh decision that came out

877
00:32:23,190 --> 00:32:21,279
about a month ago well it turns out that

878
00:32:26,310 --> 00:32:23,200
the administration makes these decisions

879
00:32:28,389 --> 00:32:26,320
and there is not a final decision uh

880
00:32:29,509 --> 00:32:28,399
if you look historically at how

881
00:32:31,269 --> 00:32:29,519
we have

882
00:32:33,990 --> 00:32:31,279
made these decisions i look back to the

883
00:32:36,149 --> 00:32:34,000
very space shuttle program and the

884
00:32:39,909 --> 00:32:36,159
administration looks

885
00:32:42,789 --> 00:32:39,919
very very closely at getting the right

886
00:32:44,710 --> 00:32:42,799
design that we know when we put it

887
00:32:46,789 --> 00:32:44,720
forward is affordable

888
00:32:48,310 --> 00:32:46,799

and sustainable

889
00:32:50,950 --> 00:32:48,320
we have

890
00:32:54,630 --> 00:32:50,960
absolutely a reference design that we

891
00:32:57,029 --> 00:32:54,640
are looking at very closely that as we

892
00:32:58,870 --> 00:32:57,039
look at the costs and the independent

893
00:32:59,990 --> 00:32:58,880
cost assessment we will be ready to

894
00:33:02,389 --> 00:33:00,000
announce

895
00:33:04,389 --> 00:33:02,399
and and where in the administration is

896
00:33:06,710 --> 00:33:04,399
we looking at it which part of the

897
00:33:10,789 --> 00:33:06,720
administration we're one team in our

898
00:33:15,669 --> 00:33:13,830
uh leon wright with irish television uh

899
00:33:17,669 --> 00:33:15,679
we had a look yesterday at the spacex

900
00:33:20,070 --> 00:33:17,679
vehicle the uh the small

901
00:33:23,029 --> 00:33:20,080
capsule that they they've developed

902
00:33:25,029 --> 00:33:23,039
can you describe for a layperson where

903
00:33:27,269 --> 00:33:25,039
these two vehicles fit in evolutionary

904
00:33:29,190 --> 00:33:27,279
terms rather like the t-shirt that shows

905
00:33:31,190 --> 00:33:29,200
homo sapiens i mean can you can you

906
00:33:36,310 --> 00:33:31,200
place these two vehicles on that

907
00:33:42,630 --> 00:33:39,750
i can uh i i i

908
00:33:44,950 --> 00:33:42,640
i'm i less compared to

909
00:33:47,029 --> 00:33:44,960
evolution than those types of

910
00:33:48,710 --> 00:33:47,039
technologies that once you develop them

911
00:33:52,389 --> 00:33:48,720
become operational while you still

912
00:33:54,230 --> 00:33:52,399
develop the next so if we are looking at

913
00:33:56,549 --> 00:33:54,240

things we've done for 50 years which is

914
00:33:59,430 --> 00:33:56,559
go to and from low earth orbit of

915
00:34:01,350 --> 00:33:59,440
launching people and things we know that

916
00:34:03,350 --> 00:34:01,360
we have uh

917
00:34:06,710 --> 00:34:03,360
for decades now done that with the

918
00:34:08,869 --> 00:34:06,720
private sector we have paid the private

919
00:34:10,710 --> 00:34:08,879
sector to launch a satellite we now

920
00:34:12,230 --> 00:34:10,720
intend to pay the private sector to

921
00:34:14,470 --> 00:34:12,240
launch crew

922
00:34:15,990 --> 00:34:14,480
same thing that we've done in the past

923
00:34:18,389 --> 00:34:16,000
at nasa

924
00:34:20,629 --> 00:34:18,399
we have developed new vehicles that are

925
00:34:22,629 --> 00:34:20,639
going further and that are putting in

926
00:34:24,629 --> 00:34:22,639
the new technology that we have

927
00:34:27,030 --> 00:34:24,639
developed through these investments in

928
00:34:29,190 --> 00:34:27,040
order to do the cutting edge exploration

929
00:34:31,750 --> 00:34:29,200
that is is orion that is the difference

930
00:34:33,909 --> 00:34:31,760
when i said it's uh would be

931
00:34:35,750 --> 00:34:33,919
uh overbuilt and overqualified for the

932
00:34:37,190 --> 00:34:35,760
station mission it can do the station

933
00:34:39,909 --> 00:34:37,200
mission it is

934
00:34:42,310 --> 00:34:39,919
simply something that would cost

935
00:34:44,869 --> 00:34:42,320
much more to do and so you'd rather have

936
00:34:46,629 --> 00:34:44,879
that an efficient way nasa has spent uh

937
00:34:48,470 --> 00:34:46,639
nearly a third of our budget on space

938
00:34:49,909 --> 00:34:48,480

transportation to and from low earth

939
00:34:52,310 --> 00:34:49,919
orbit if you spent a third of your

940
00:34:54,069 --> 00:34:52,320
budget on your car you would have a very

941
00:34:55,030 --> 00:34:54,079
difficult time balancing your budget or

942
00:34:57,910 --> 00:34:55,040
doing

943
00:34:59,990 --> 00:34:57,920
new things so we are just looking to

944
00:35:02,150 --> 00:35:00,000
do those things that have broader

945
00:35:03,750 --> 00:35:02,160
markets that we have done for a longer

946
00:35:06,390 --> 00:35:03,760
period of time we have

947
00:35:08,870 --> 00:35:06,400
used this model for our launch industry

948
00:35:11,109 --> 00:35:08,880
communications satellite industry many

949
00:35:13,190 --> 00:35:11,119
types of space have been

950
00:35:14,870 --> 00:35:13,200
now operated by the private sector and

951
00:35:16,710 --> 00:35:14,880
we just buy the service

952
00:35:17,750 --> 00:35:16,720
that is our our

953
00:35:18,550 --> 00:35:17,760
model

954
00:35:21,349 --> 00:35:18,560
for

955
00:35:23,750 --> 00:35:21,359
commercial low-earth orbit and nasa

956
00:35:26,550 --> 00:35:23,760
intends to with our industry partners

957
00:35:28,950 --> 00:35:26,560
lockheed go beyond with this vehicle

958
00:35:30,870 --> 00:35:28,960
could i maybe be more blunt and say that

959
00:35:33,670 --> 00:35:30,880
the people in spacex talk about taking

960
00:35:36,630 --> 00:35:33,680
their vehicle to mars so why is the

961
00:35:39,430 --> 00:35:36,640
government building a vehicle

962
00:35:40,950 --> 00:35:39,440
nasa looked very closely as i uh told

963
00:35:42,790 --> 00:35:40,960

you to

964
00:35:45,109 --> 00:35:42,800
look at our requirements for these deep

965
00:35:47,990 --> 00:35:45,119
space vehicles and we determined that

966
00:35:49,829 --> 00:35:48,000
they are in fact different enough than

967
00:35:52,870 --> 00:35:49,839
the capability we require on the space

968
00:35:54,950 --> 00:35:52,880
station to invest in a different vehicle

969
00:35:56,710 --> 00:35:54,960
now absolutely in the future i know

970
00:35:59,349 --> 00:35:56,720
charlie bolden has said this we do our

971
00:36:01,670 --> 00:35:59,359
first uh test flights and missions with

972
00:36:04,069 --> 00:36:01,680
this we could compete for a deep space

973
00:36:06,470 --> 00:36:04,079
vehicle and an orion can compete and if

974
00:36:09,670 --> 00:36:06,480
someone evolves another vehicle that

975
00:36:11,829 --> 00:36:09,680
could could uh be in in a future we

976
00:36:13,190 --> 00:36:11,839
truly believe at this point there is not

977
00:36:16,069 --> 00:36:13,200
another market

978
00:36:17,670 --> 00:36:16,079
for a human mission to an asteroid

979
00:36:19,829 --> 00:36:17,680
or mars

980
00:36:20,550 --> 00:36:19,839
probably not even the moon at this point

981
00:36:22,630 --> 00:36:20,560
but

982
00:36:25,030 --> 00:36:22,640
i absolutely hope and believe there will

983
00:36:26,950 --> 00:36:25,040
be in the future we paved the way this

984
00:36:28,150 --> 00:36:26,960
is the lewis and clark mission you know

985
00:36:30,630 --> 00:36:28,160
certainly

986
00:36:32,470 --> 00:36:30,640
folks went after that's the whole goal

987
00:36:35,190 --> 00:36:32,480
uh and we

988
00:36:36,950 --> 00:36:35,200

hope our partners at spacex can be

989
00:36:39,589 --> 00:36:36,960
successful along with the other

990
00:36:42,310 --> 00:36:39,599
competitors in order to bring down this

991
00:36:44,150 --> 00:36:42,320
cost and then allow us to go uh further

992
00:36:45,750 --> 00:36:44,160
we we want all of these industry

993
00:36:48,550 --> 00:36:45,760
partners i think it's one of the most

994
00:36:50,550 --> 00:36:48,560
exciting things about the future

995
00:36:52,630 --> 00:36:50,560
we're capitalist society we're a nation

996
00:36:54,630 --> 00:36:52,640
that loves a competition i remember norm

997
00:36:57,270 --> 00:36:54,640
augustine saying uh you know i know we

998
00:36:59,030 --> 00:36:57,280
like to cooperate but uh how many people

999
00:37:00,870 --> 00:36:59,040
go to the all-star game as compared to

1000
00:37:04,069 --> 00:37:00,880
the super bowl so we're going to harness

1001
00:37:06,950 --> 00:37:04,079
that that spirit and have a competition

1002
00:37:08,310 --> 00:37:06,960
for the low earth orbit portion as we go

1003
00:37:09,750 --> 00:37:08,320
on we hope there'll be future

1004
00:37:11,510 --> 00:37:09,760
competitions

1005
00:37:13,349 --> 00:37:11,520
the very first question was about

1006
00:37:15,030 --> 00:37:13,359
international partnership and what they

1007
00:37:17,030 --> 00:37:15,040
could add specifically to this and while

1008
00:37:18,870 --> 00:37:17,040
i wanted mark to answer the specifics of

1009
00:37:22,069 --> 00:37:18,880
it i do want to be clear the national

1010
00:37:23,750 --> 00:37:22,079
space policy is extremely forward

1011
00:37:25,670 --> 00:37:23,760
leaning on working with our

1012
00:37:28,550 --> 00:37:25,680
international partners as we go further

1013
00:37:29,589 --> 00:37:28,560

and explore we believe that exploration

1014
00:37:31,750 --> 00:37:29,599
is

1015
00:37:35,670 --> 00:37:31,760
not only an american dream but a human

1016
00:37:38,390 --> 00:37:35,680
drive of our spirit and we believe that

1017
00:37:40,870 --> 00:37:38,400
as we go

1018
00:37:43,270 --> 00:37:40,880
not only to the asteroid mission but to

1019
00:37:45,670 --> 00:37:43,280
mars that we will be doing that

1020
00:37:47,750 --> 00:37:45,680
with international partners

1021
00:37:49,990 --> 00:37:47,760
that's all the time we have the next

1022
00:37:52,310 --> 00:37:50,000
event on nasa tv will be the countdown

1023
00:37:55,990 --> 00:37:52,320
status briefing at 10 am for more