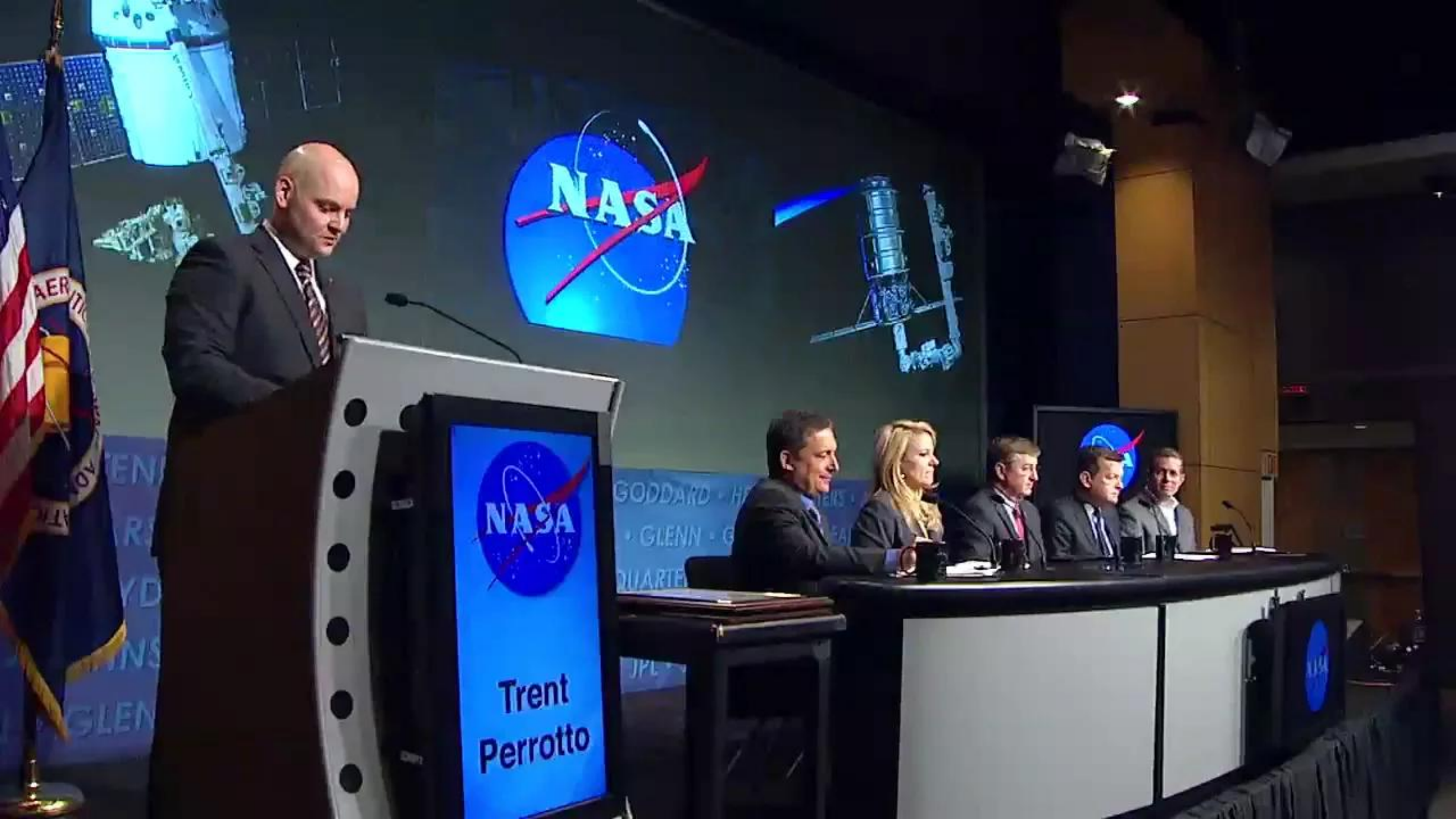
NASA
Trent
Perrotto
GODDARD
GLENN

1
00:00:05,190 --> 00:00:03,510
good morning and welcome to nasa

2
00:00:07,030 --> 00:00:05,200
headquarters in washington i'm public

3
00:00:08,310 --> 00:00:07,040
affairs officer trent parado and we're

4
00:00:10,310 --> 00:00:08,320
here to discuss the successful

5
00:00:12,310 --> 00:00:10,320
completion of nasa's commercial orbital

6
00:00:13,350 --> 00:00:12,320
transportation services or cots

7
00:00:15,589 --> 00:00:13,360
initiative

8
00:00:17,349 --> 00:00:15,599
through cots two u.s companies nasa

9
00:00:18,950 --> 00:00:17,359
partners spacex and orbital sciences

10
00:00:21,189 --> 00:00:18,960
developed new spacecraft and rockets

11
00:00:23,029 --> 00:00:21,199
capable of resupplying the international

12
00:00:25,269 --> 00:00:23,039
space station with cargo launch right

13
00:00:27,029 --> 00:00:25,279

here on u.s soil you can find out more

14
00:00:29,589 --> 00:00:27,039
about nasa and commercial space at

15
00:00:31,509 --> 00:00:29,599
www.nasa.gov

16
00:00:33,190 --> 00:00:31,519
slash commercial we have a distinguished

17
00:00:34,709 --> 00:00:33,200
panel of guests joining us today to

18
00:00:36,549 --> 00:00:34,719
discuss the successful completion of the

19
00:00:38,549 --> 00:00:36,559
cost initiative and what it means for a

20
00:00:41,190 --> 00:00:38,559
future human space flight let me

21
00:00:43,350 --> 00:00:41,200
introduce them now to my left is alan

22
00:00:45,750 --> 00:00:43,360
lindenmoyer manager of nasa's commercial

23
00:00:47,990 --> 00:00:45,760
crew and cargo program

24
00:00:49,510 --> 00:00:48,000
and we have gwen shotwell president

25
00:00:52,150 --> 00:00:49,520
spacex

26
00:00:53,830 --> 00:00:52,160
next is frank culbertson executive vice

27
00:00:56,470 --> 00:00:53,840
president and general manager of orbital

28
00:00:58,869 --> 00:00:56,480
sciences advanced programs group

29
00:01:00,470 --> 00:00:58,879
frank slaser vice president of space

30
00:01:02,229 --> 00:01:00,480
systems the aerospace industries

31
00:01:04,390 --> 00:01:02,239
association

32
00:01:06,390 --> 00:01:04,400
and phil mcallister nasa's director of

33
00:01:08,230 --> 00:01:06,400
commercial humans excuse me commercial

34
00:01:09,429 --> 00:01:08,240
space flight development but before we

35
00:01:10,950 --> 00:01:09,439
turn the discussion over to our panel

36
00:01:13,030 --> 00:01:10,960
i'd just like to introduce nasa

37
00:01:22,149 --> 00:01:13,040
administrator charles bolden for a few

38
00:01:26,630 --> 00:01:24,310

thank you trent and thanks to all of you

39
00:01:28,310 --> 00:01:26,640
for coming tuning in tweeting doing

40
00:01:30,710 --> 00:01:28,320
whatever you're doing to take part in

41
00:01:32,550 --> 00:01:30,720
this this great event today

42
00:01:34,870 --> 00:01:32,560
i want to welcome all of you to this

43
00:01:37,030 --> 00:01:34,880
milestone moment in nasa's commitment to

44
00:01:38,789 --> 00:01:37,040
transition the transportation of both

45
00:01:40,630 --> 00:01:38,799
cargo and crew to the international

46
00:01:43,270 --> 00:01:40,640
space station and other future low earth

47
00:01:45,749 --> 00:01:43,280
orbit destinations to our commercial

48
00:01:47,510 --> 00:01:45,759
industry partners a little more than two

49
00:01:49,030 --> 00:01:47,520
years ago

50
00:01:51,350 --> 00:01:49,040
after the end of the space shuttle

51
00:01:53,510 --> 00:01:51,360
program two american companies spacex of

52
00:01:55,429 --> 00:01:53,520
hawthorne california and orbital

53
00:01:57,749 --> 00:01:55,439
sciences corporation of dulles virginia

54
00:01:59,830 --> 00:01:57,759
have restored american capability to

55
00:02:01,670 --> 00:01:59,840
deliver and return experiments and

56
00:02:04,469 --> 00:02:01,680
supplies to the international space

57
00:02:06,069 --> 00:02:04,479
station replacing our reliance on on

58
00:02:08,150 --> 00:02:06,079
foreign providers

59
00:02:10,389 --> 00:02:08,160
their successes mark the conclusion of

60
00:02:12,949 --> 00:02:10,399
nasa's commercial orbital transportation

61
00:02:15,030 --> 00:02:12,959
services or cots program

62
00:02:17,030 --> 00:02:15,040
and clear the way for both companies to

63
00:02:19,670 --> 00:02:17,040

begin providing regular transportation

64
00:02:22,070 --> 00:02:19,680
services to the iss

65
00:02:23,670 --> 00:02:22,080
spacex completed its cot's development

66
00:02:26,390 --> 00:02:23,680
with a demonstration mission to the

67
00:02:28,150 --> 00:02:26,400
space station last year

68
00:02:30,869 --> 00:02:28,160
since then the company has flown the

69
00:02:33,990 --> 00:02:30,879
first two of 12 contracted cargo

70
00:02:36,790 --> 00:02:34,000
resupply flights to the space station

71
00:02:39,270 --> 00:02:36,800
orbital sciences ended its development

72
00:02:41,030 --> 00:02:39,280
phase in october of this year with a

73
00:02:42,550 --> 00:02:41,040
successful demonstration mission to the

74
00:02:44,710 --> 00:02:42,560
space station

75
00:02:46,949 --> 00:02:44,720
orbital is poised to launch the first of

76
00:02:49,509 --> 00:02:46,959
its eight cargo resupply missions to the

77
00:02:51,350 --> 00:02:49,519
station in december

78
00:02:53,430 --> 00:02:51,360
these achievements are the result of

79
00:02:55,830 --> 00:02:53,440
strong bipartisan leadership by the

80
00:02:57,990 --> 00:02:55,840
obama and bush administrations

81
00:03:00,470 --> 00:02:58,000
as well as the extraordinary skill and

82
00:03:03,190 --> 00:03:00,480
dedication of the men and women of nasa

83
00:03:04,710 --> 00:03:03,200
and our partners in the private sector

84
00:03:06,790 --> 00:03:04,720
building on this public-private

85
00:03:09,589 --> 00:03:06,800
partnership model president obama has

86
00:03:11,750 --> 00:03:09,599
invested in an even more ambitious plan

87
00:03:14,550 --> 00:03:11,760
to have american companies transport our

88
00:03:16,790 --> 00:03:14,560

astronauts to the iss on spacecraft

89
00:03:18,710 --> 00:03:16,800
launched from american soil

90
00:03:20,070 --> 00:03:18,720
ending the outsourcing of this work

91
00:03:21,910 --> 00:03:20,080
overseas

92
00:03:24,070 --> 00:03:21,920
it's now critically important to get

93
00:03:27,589 --> 00:03:24,080
full funding from congress to keep us on

94
00:03:29,910 --> 00:03:27,599
track to begin these launches in 2017.

95
00:03:31,670 --> 00:03:29,920
three companies spacex boeing and sierra

96
00:03:33,110 --> 00:03:31,680
nevada are already hard at work

97
00:03:35,430 --> 00:03:33,120
developing the next generation

98
00:03:37,589 --> 00:03:35,440
spacecraft and rockets capable of

99
00:03:40,229 --> 00:03:37,599
transporting humans to and from low

100
00:03:41,350 --> 00:03:40,239
earth orbit from american soil

101
00:03:43,030 --> 00:03:41,360
next week

102
00:03:44,949 --> 00:03:43,040
we will issue a final request for

103
00:03:47,430 --> 00:03:44,959
proposals for contracts designed to

104
00:03:49,110 --> 00:03:47,440
ensure commercial companies meet nasa's

105
00:03:51,750 --> 00:03:49,120
safety requirements for transporting

106
00:03:53,030 --> 00:03:51,760
nasa crews to and from the international

107
00:03:55,670 --> 00:03:53,040
space station

108
00:03:57,990 --> 00:03:55,680
so in many ways the completion of cots

109
00:03:59,990 --> 00:03:58,000
is simply a passing of the torch of

110
00:04:01,910 --> 00:04:00,000
innovation to our partners in the

111
00:04:04,630 --> 00:04:01,920
commercial crew program

112
00:04:07,270 --> 00:04:04,640
today it's absolutely clear

113
00:04:08,550 --> 00:04:07,280

america's best days in space exploration

114
00:04:10,470 --> 00:04:08,560
are ahead of us

115
00:04:12,229 --> 00:04:10,480
thanks to the grit and determination of

116
00:04:15,190 --> 00:04:12,239
those in government and the private

117
00:04:16,949 --> 00:04:15,200
sector who dare to dream big dreams and

118
00:04:18,469 --> 00:04:16,959
have the skills to turn them into

119
00:04:20,710 --> 00:04:18,479
reality

120
00:04:22,950 --> 00:04:20,720
in a moment you'll hear details about

121
00:04:25,430 --> 00:04:22,960
our cots program and its successes from

122
00:04:27,270 --> 00:04:25,440
the key architects of that program

123
00:04:28,950 --> 00:04:27,280
at this time i want to recognize

124
00:04:30,710 --> 00:04:28,960
something we have become accustomed to

125
00:04:32,950 --> 00:04:30,720
in this arena

126
00:04:34,950 --> 00:04:32,960
i want to recognize all of them for

127
00:04:36,950 --> 00:04:34,960
bringing us to this historic turning

128
00:04:39,030 --> 00:04:36,960
point by presenting each of them with a

129
00:04:40,629 --> 00:04:39,040
nasa group achievement award

130
00:04:42,790 --> 00:04:40,639
first i'm going to present to alan

131
00:04:45,590 --> 00:04:42,800
lindemore manager of nasa's commercial

132
00:04:47,830 --> 00:04:45,600
crew and cargo program the citation for

133
00:04:49,510 --> 00:04:47,840
for allen will read for outstanding

134
00:04:51,350 --> 00:04:49,520
contributions and innovative

135
00:04:53,990 --> 00:04:51,360
accomplishments in the area of human

136
00:04:55,830 --> 00:04:54,000
space exploration by facilitating the

137
00:04:58,390 --> 00:04:55,840
development of a new generation of

138
00:05:00,469 --> 00:04:58,400

american rockets and spacecraft paving

139
00:05:14,870 --> 00:05:00,479
the way for 21st century commercial

140
00:05:18,950 --> 00:05:16,790
and so i only have to read the citation

141
00:05:20,390 --> 00:05:18,960
once i'm gonna i'm gonna tell you about

142
00:05:22,790 --> 00:05:20,400
the next two people and then we'll get

143
00:05:25,430 --> 00:05:22,800
them up one at a time but then together

144
00:05:28,150 --> 00:05:25,440
they do that thing every once in a while

145
00:05:29,909 --> 00:05:28,160
to gwen shotwell president of spacex and

146
00:05:31,590 --> 00:05:29,919
frank culbertson executive vice

147
00:05:33,749 --> 00:05:31,600
president and general manager orbital

148
00:05:36,390 --> 00:05:33,759
sciences advanced programs group

149
00:05:37,909 --> 00:05:36,400
their citations read for outstanding

150
00:05:39,590 --> 00:05:37,919
contributions and innovative

151
00:05:41,990 --> 00:05:39,600
accomplishments in the area of human

152
00:05:43,909 --> 00:05:42,000
space exploration by developing a new

153
00:05:46,629 --> 00:05:43,919
generation of american rockets and

154
00:05:48,710 --> 00:05:46,639
spacecraft paving the way for 21st

155
00:05:50,870 --> 00:05:48,720
century commercial space flight

156
00:06:08,710 --> 00:05:50,880
congratulations gwen and to frank and

157
00:06:08,720 --> 00:06:14,309
i know i can get you to behave sometimes

158
00:06:14,319 --> 00:06:18,790
sometimes

159
00:06:22,390 --> 00:06:20,390
would you come on up here and join us

160
00:06:27,110 --> 00:06:22,400
and we'll get the three of you

161
00:06:27,120 --> 00:06:42,950
how's this i need to move that one

162
00:06:46,070 --> 00:06:45,270
congratulations to all of you once again

163
00:06:49,029 --> 00:06:46,080

and

164
00:06:51,189 --> 00:06:49,039
this is an exciting day as i said

165
00:06:52,790 --> 00:06:51,199
you know it's kind of quirky maybe but

166
00:06:55,110 --> 00:06:52,800
we just finished taking the olympic

167
00:06:57,270 --> 00:06:55,120
torch up the station last week and

168
00:06:59,589 --> 00:06:57,280
getting it back down so in a way this is

169
00:07:01,430 --> 00:06:59,599
passing another torch uh we're really

170
00:07:03,830 --> 00:07:01,440
excited about our commercial crew

171
00:07:05,270 --> 00:07:03,840
program i think uh the com successful

172
00:07:06,950 --> 00:07:05,280
completion of the cots program and

173
00:07:09,029 --> 00:07:06,960
moving into business

174
00:07:10,390 --> 00:07:09,039
uh signals that that we've got a pretty

175
00:07:12,230 --> 00:07:10,400
good idea about how to do this thing and

176
00:07:13,749 --> 00:07:12,240
i'm very confident we'll get it done so

177
00:07:15,110 --> 00:07:13,759
congratulations to all of you again i'm

178
00:07:23,350 --> 00:07:15,120
going to turn it back over to trent and

179
00:07:27,189 --> 00:07:25,029
okay so let's hear from our

180
00:07:28,950 --> 00:07:27,199
award-winning panelists then

181
00:07:30,870 --> 00:07:28,960
and we'll begin with allen lindenmoyer

182
00:07:33,270 --> 00:07:30,880
thank you trent and thank you charlie so

183
00:07:35,430 --> 00:07:33,280
much what a great what a great surprise

184
00:07:37,270 --> 00:07:35,440
and what an honor and a pleasure to be

185
00:07:39,430 --> 00:07:37,280
here today to talk about the success of

186
00:07:42,070 --> 00:07:39,440
cots with my great friends uh from

187
00:07:44,309 --> 00:07:42,080
spacex and orbital

188
00:07:49,350 --> 00:07:44,319

um

189
00:07:52,550 --> 00:07:50,550
it worked

190
00:07:54,629 --> 00:07:52,560
spacex

191
00:07:56,550 --> 00:07:54,639
uh

192
00:07:59,189 --> 00:07:56,560
the origin of cots was from a very

193
00:08:01,749 --> 00:07:59,199
healthy competition we had a large group

194
00:08:04,230 --> 00:08:01,759
of companies that competed

195
00:08:06,070 --> 00:08:04,240
to become our partners but we had high

196
00:08:08,150 --> 00:08:06,080
confidence in these two companies that

197
00:08:10,869 --> 00:08:08,160
they were going to deliver and they

198
00:08:12,710 --> 00:08:10,879
certainly did not let us down

199
00:08:14,790 --> 00:08:12,720
i personally had confidence that these

200
00:08:16,710 --> 00:08:14,800
companies were going to produce new

201
00:08:18,469 --> 00:08:16,720
space transportation systems with or

202
00:08:19,270 --> 00:08:18,479
without nasa's help

203
00:08:21,749 --> 00:08:19,280
but

204
00:08:24,390 --> 00:08:21,759
i think we've seen here with that

205
00:08:26,790 --> 00:08:24,400
contribution of financial support from

206
00:08:28,629 --> 00:08:26,800
nasa and the technical

207
00:08:29,990 --> 00:08:28,639
resources we had available really

208
00:08:32,230 --> 00:08:30,000
accelerated

209
00:08:34,949 --> 00:08:32,240
the work that you had planned to do

210
00:08:37,430 --> 00:08:34,959
and uh it certainly

211
00:08:40,709 --> 00:08:37,440
was great to see us succeed uh kotz was

212
00:08:42,550 --> 00:08:40,719
a challenge to private industry

213
00:08:44,710 --> 00:08:42,560

it certainly was a new way of doing

214
00:08:46,870 --> 00:08:44,720
business for us but

215
00:08:49,670 --> 00:08:46,880
it was an experiment to

216
00:08:50,550 --> 00:08:49,680
to show that with with

217
00:08:58,790 --> 00:08:50,560
a

218
00:09:01,750 --> 00:08:58,800
so difficult in this business

219
00:09:04,630 --> 00:09:01,760
along with partnering with access to

220
00:09:06,150 --> 00:09:04,640
nasa's vast history of lessons learned

221
00:09:09,110 --> 00:09:06,160
and our experience we've learned over

222
00:09:10,790 --> 00:09:09,120
the years and

223
00:09:12,870 --> 00:09:10,800
availability of our technical support

224
00:09:14,630 --> 00:09:12,880
when needed you couple those two things

225
00:09:17,350 --> 00:09:14,640
together put it with two very strong

226
00:09:19,350 --> 00:09:17,360
companies could it lead to the

227
00:09:20,710 --> 00:09:19,360
development of new state-of-the-art

228
00:09:22,389 --> 00:09:20,720
systems well

229
00:09:23,990 --> 00:09:22,399
why don't we take a look at the amazing

230
00:09:40,949 --> 00:09:24,000
machines that these companies have

231
00:09:44,630 --> 00:09:42,630
three two

232
00:09:47,750 --> 00:09:44,640
one

233
00:09:50,870 --> 00:09:47,760
this is the falcon 9 on the cops first

234
00:09:53,269 --> 00:09:50,880
demonstration launch

235
00:09:59,829 --> 00:09:53,279
this was out of the cape in december of

236
00:10:04,550 --> 00:10:03,190
and then on the second flight

237
00:10:10,550 --> 00:10:04,560
uh in

238
00:10:14,310 --> 00:10:12,230

this flight was just a two-orbit

239
00:10:16,389 --> 00:10:14,320
demonstration

240
00:10:19,269 --> 00:10:16,399
and then on the second flight in may

241
00:10:21,269 --> 00:10:19,279
the dragon successfully uh did a flyby

242
00:10:22,710 --> 00:10:21,279
of the station rendezvoused with the

243
00:10:25,590 --> 00:10:22,720
station

244
00:10:27,430 --> 00:10:25,600
and then had a perfectly successful

245
00:10:29,829 --> 00:10:27,440
birthing to the station

246
00:10:32,790 --> 00:10:29,839
on the mission they did carry

247
00:10:35,430 --> 00:10:32,800
some demonstration cargo to prove out

248
00:10:37,110 --> 00:10:35,440
all of their internal systems

249
00:10:38,389 --> 00:10:37,120
the dragon stayed on orbit for about a

250
00:10:41,030 --> 00:10:38,399
week

251
00:10:41,040 --> 00:10:58,230
was unburned

252
00:11:03,750 --> 00:11:00,550
boy things go pretty fast when you're

253
00:11:06,310 --> 00:11:03,760
looking at it for the second time

254
00:11:08,150 --> 00:11:06,320
a couple revs later uh the dragon had a

255
00:11:10,870 --> 00:11:08,160
great successful splashdown in the south

256
00:11:14,389 --> 00:11:10,880
pacific was immediately recovered

257
00:11:16,069 --> 00:11:14,399
uh brought back and uh proved that it

258
00:11:19,829 --> 00:11:16,079
was a good reliable system of getting

259
00:11:24,150 --> 00:11:22,150
and then uh

260
00:11:29,190 --> 00:11:24,160
at this last uh april was the first

261
00:11:32,230 --> 00:11:31,190
rocket system to the international space

262
00:11:33,750 --> 00:11:32,240
station

263
00:11:35,990 --> 00:11:33,760

and then just a few months later in

264
00:11:37,750 --> 00:11:36,000
september it made its flight to the

265
00:11:39,509 --> 00:11:37,760
space station

266
00:11:42,069 --> 00:11:39,519
september 23rd

267
00:11:52,710 --> 00:11:42,079
out of a brand new launch pad at wallops

268
00:11:55,430 --> 00:11:53,910
the cygnus

269
00:11:58,870 --> 00:11:55,440
took its time getting to the space

270
00:12:01,430 --> 00:11:58,880
station and demonstrated its ability to

271
00:12:03,910 --> 00:12:01,440
load her in orbit for about a week got

272
00:12:06,150 --> 00:12:03,920
its system straightened out and

273
00:12:07,910 --> 00:12:06,160
was ready to go did a flawless approach

274
00:12:09,590 --> 00:12:07,920
to the station

275
00:12:11,829 --> 00:12:09,600
was captured

276
00:12:17,509 --> 00:12:11,839
and then had a

277
00:12:21,190 --> 00:12:18,790
to the station

278
00:12:23,509 --> 00:12:21,200
it also carried

279
00:12:28,069 --> 00:12:23,519
a complement of demonstration cargo

280
00:12:33,110 --> 00:12:31,590
oh 1500 pounds of cargo was brought up

281
00:12:35,110 --> 00:12:33,120
and then

282
00:12:37,509 --> 00:12:35,120
karen and luca and the other crew on

283
00:12:39,269 --> 00:12:37,519
board stuffed it full of

284
00:12:40,870 --> 00:12:39,279
trash and other items that needed to be

285
00:12:44,389 --> 00:12:40,880
disposed it has a lot of room in the

286
00:12:51,110 --> 00:12:46,550
they loaded that up

287
00:12:52,550 --> 00:12:51,120
with about oh gosh 2600 pounds of

288
00:12:57,190 --> 00:12:52,560

equipment and

289
00:12:57,200 --> 00:12:59,910
on the

290
00:13:06,069 --> 00:13:02,949
22nd of october and then the next day

291
00:13:07,670 --> 00:13:06,079
space station release confirmed at 6 31

292
00:13:09,670 --> 00:13:07,680
a.m central time once again the two

293
00:13:11,430 --> 00:13:09,680
vehicles were high above the atlantic

294
00:13:13,750 --> 00:13:11,440
ocean

295
00:13:21,750 --> 00:13:13,760
station houston cygnus has exited the

296
00:13:28,629 --> 00:13:24,710
had a safe and uneventful re-entry on

297
00:13:33,269 --> 00:13:31,670
these are incredible machines they're

298
00:13:35,509 --> 00:13:33,279
highly complex

299
00:13:39,030 --> 00:13:35,519
state-of-the-art spacecraft

300
00:13:44,230 --> 00:13:41,829
certainly worked beautifully well

301
00:13:45,910 --> 00:13:44,240
on the demonstration which set up now

302
00:13:49,110 --> 00:13:45,920
paved the way for

303
00:13:51,189 --> 00:13:49,120
cargo services for several years to come

304
00:13:52,949 --> 00:13:51,199
and keep keep the space station going

305
00:13:55,670 --> 00:13:52,959
with all the incredible research it's

306
00:14:01,110 --> 00:13:59,030
kotz needs uh

307
00:14:02,790 --> 00:14:01,120
it's not for everything gotz was a new

308
00:14:04,310 --> 00:14:02,800
weighing business it was a new way of

309
00:14:06,710 --> 00:14:04,320
doing business and it certainly needed

310
00:14:09,110 --> 00:14:06,720
the right ingredients to be successful a

311
00:14:11,590 --> 00:14:09,120
good strong value comp uh proposition

312
00:14:14,069 --> 00:14:11,600
from the companies proposing uh we

313
00:14:15,910 --> 00:14:14,079

weren't looking to expand new technology

314
00:14:18,230 --> 00:14:15,920
this was taking technology that was

315
00:14:21,110 --> 00:14:18,240
known repackaging in a more cost

316
00:14:23,590 --> 00:14:21,120
effective and innovative way

317
00:14:25,590 --> 00:14:23,600
it needs multiple companies

318
00:14:27,750 --> 00:14:25,600
to have a good healthy competition needs

319
00:14:29,829 --> 00:14:27,760
good strong financing

320
00:14:31,990 --> 00:14:29,839
because nasa did not pay the full cost

321
00:14:35,030 --> 00:14:32,000
there was a

322
00:14:36,949 --> 00:14:35,040
a very significant amount of investment

323
00:14:38,790 --> 00:14:36,959
from these companies and you have to

324
00:14:41,030 --> 00:14:38,800
have multiple markets government can't

325
00:14:45,590 --> 00:14:41,040
be the only customer

326
00:14:51,750 --> 00:14:49,430
others in industry and expanding the us

327
00:14:53,670 --> 00:14:51,760
commercial industry this is american

328
00:14:55,509 --> 00:14:53,680
ingenuity at its best

329
00:14:59,509 --> 00:14:55,519
resulting in safe reliable and

330
00:15:01,430 --> 00:14:59,519
cost-effective space transportation

331
00:15:03,269 --> 00:15:01,440
providing incredibly important job of

332
00:15:05,910 --> 00:15:03,279
resupplying the space station taking

333
00:15:07,750 --> 00:15:05,920
over the job of the shuttle

334
00:15:09,670 --> 00:15:07,760
was intended to do it's going to keep

335
00:15:12,550 --> 00:15:09,680
space station going for many many years

336
00:15:14,550 --> 00:15:12,560
to come all the great research going on

337
00:15:22,710 --> 00:15:14,560
uh

338
00:15:25,189 --> 00:15:22,720

to focus on

339
00:15:27,030 --> 00:15:25,199
on the more current and and difficult

340
00:15:29,269 --> 00:15:27,040
challenges of building the new vehicles

341
00:15:31,829 --> 00:15:29,279
and spacecraft we need to explore beyond

342
00:15:33,990 --> 00:15:31,839
low earth orbit and make our way out to

343
00:15:36,710 --> 00:15:34,000
the asteroids and eventually to mars so

344
00:15:38,629 --> 00:15:36,720
congratulations well done

345
00:15:46,150 --> 00:15:38,639
uh thank you for making nasa a very

346
00:15:49,910 --> 00:15:47,829
okay thanks alan let's turn it over to

347
00:15:52,550 --> 00:15:49,920
spacex president gwen shotwell thanks

348
00:15:55,189 --> 00:15:52,560
very much uh it's a pleasure to be here

349
00:15:57,509 --> 00:15:55,199
this morning still this morning

350
00:15:59,829 --> 00:15:57,519
we've been thankful to nasa

351
00:16:01,829 --> 00:15:59,839
throughout the the program for their

352
00:16:03,430 --> 00:16:01,839
support and their help but what i really

353
00:16:06,310 --> 00:16:03,440
wanted to highlight here this morning

354
00:16:09,590 --> 00:16:06,320
was to thank nasa for the vision that

355
00:16:12,069 --> 00:16:09,600
they had in creating this program

356
00:16:13,269 --> 00:16:12,079
it was a revolutionary program and

357
00:16:15,110 --> 00:16:13,279
provided

358
00:16:17,749 --> 00:16:15,120
a great opportunity for the commercial

359
00:16:19,509 --> 00:16:17,759
space sector to uh to do what they do

360
00:16:21,910 --> 00:16:19,519
best and to flourish

361
00:16:23,829 --> 00:16:21,920
and result in really enormous capability

362
00:16:25,350 --> 00:16:23,839
now in the united states

363
00:16:27,509 --> 00:16:25,360

so we're incredibly proud of what we've

364
00:16:30,389 --> 00:16:27,519
accomplished over these years under the

365
00:16:32,069 --> 00:16:30,399
cots program and we're honored uh to

366
00:16:33,350 --> 00:16:32,079
have been selected and to help restore

367
00:16:36,389 --> 00:16:33,360
the cargo capability to the

368
00:16:38,470 --> 00:16:36,399
international space station domestically

369
00:16:41,829 --> 00:16:38,480
this program was an enormous success not

370
00:16:43,509 --> 00:16:41,839
only for nasa and for spacex and orbital

371
00:16:46,310 --> 00:16:43,519
as well but also for the american

372
00:16:47,590 --> 00:16:46,320
taxpayer i think the the the model that

373
00:16:50,550 --> 00:16:47,600
kotz

374
00:16:53,030 --> 00:16:50,560
followed uh is one that should be

375
00:16:54,870 --> 00:16:53,040
leveraged as we continue to go forward

376
00:16:57,269 --> 00:16:54,880
especially during these difficult uh

377
00:16:58,949 --> 00:16:57,279
budget environments as alan says it's

378
00:16:59,910 --> 00:16:58,959
probably not the right model for every

379
00:17:01,269 --> 00:16:59,920
program

380
00:17:03,350 --> 00:17:01,279
but certainly i think we should think

381
00:17:06,949 --> 00:17:03,360
very hard about following this model for

382
00:17:11,829 --> 00:17:09,590
so this was a significant departure uh

383
00:17:14,069 --> 00:17:11,839
as we talked about uh both initially

384
00:17:17,270 --> 00:17:14,079
here today as well as this morning we

385
00:17:20,150 --> 00:17:17,280
did a lessons learned uh round table

386
00:17:22,470 --> 00:17:20,160
the the focus on firm fixed price

387
00:17:25,829 --> 00:17:22,480
milestone-based contracting uh or

388
00:17:29,270 --> 00:17:25,839

agreements is incredibly uh important um

389
00:17:30,870 --> 00:17:29,280
the leveraging of uh investment uh by

390
00:17:33,909 --> 00:17:30,880
nasa's commercial partners here in this

391
00:17:36,950 --> 00:17:33,919
case us and an orbital so nasa provided

392
00:17:39,190 --> 00:17:36,960
396 million dollars worth of uh

393
00:17:41,270 --> 00:17:39,200
financial support to spacex out of an

394
00:17:42,789 --> 00:17:41,280
overall program that was about 850

395
00:17:45,750 --> 00:17:42,799
million so we spent

396
00:17:47,830 --> 00:17:45,760
over 450 million of our own uh resources

397
00:17:49,990 --> 00:17:47,840
to develop the falcon 9 and the dragon

398
00:17:51,750 --> 00:17:50,000
capability

399
00:17:52,789 --> 00:17:51,760
so falcon 9 is an extraordinary launch

400
00:17:55,590 --> 00:17:52,799
vehicle

401
00:17:56,789 --> 00:17:55,600
competitive in the elv class

402
00:17:58,470 --> 00:17:56,799
we're winning

403
00:18:00,150 --> 00:17:58,480
missions from overseas and bringing

404
00:18:02,070 --> 00:18:00,160
those critical jobs back to the united

405
00:18:04,789 --> 00:18:02,080
states which is also really cut should

406
00:18:06,390 --> 00:18:04,799
really take uh credit for that in

407
00:18:08,310 --> 00:18:06,400
addition we have a beautiful dragon

408
00:18:09,990 --> 00:18:08,320
capsule capable of taking about three

409
00:18:12,070 --> 00:18:10,000
metric tons of pressurized and

410
00:18:13,909 --> 00:18:12,080
unpressurized cargo up and bringing back

411
00:18:16,470 --> 00:18:13,919
about two and a half metric tons of

412
00:18:19,110 --> 00:18:16,480
precious science and cargo as well so

413
00:18:21,830 --> 00:18:19,120

we're enormously proud of uh of the

414
00:18:23,990 --> 00:18:21,840
partnership and working with nasa

415
00:18:26,150 --> 00:18:24,000
and this program really demonstrated how

416
00:18:28,710 --> 00:18:26,160
you can leverage the best of both

417
00:18:31,029 --> 00:18:28,720
sectors you can leverage the resources

418
00:18:32,789 --> 00:18:31,039
and the tremendous knowledge that nasa

419
00:18:35,590 --> 00:18:32,799
and the us government had

420
00:18:38,549 --> 00:18:35,600
along with the ingenuity the fast-paced

421
00:18:41,110 --> 00:18:38,559
environment rapid prototyping

422
00:18:43,510 --> 00:18:41,120
and really the drive to get things done

423
00:18:45,029 --> 00:18:43,520
of the private sector

424
00:18:46,789 --> 00:18:45,039
so we've accomplished three missions to

425
00:18:48,950 --> 00:18:46,799
the international space station we're

426
00:18:50,230 --> 00:18:48,960
looking forward to

427
00:18:53,510 --> 00:18:50,240
10 more

428
00:18:55,990 --> 00:18:53,520
as we go we've just recently

429
00:18:57,750 --> 00:18:56,000
plugged in the date for the next crs

430
00:19:00,870 --> 00:18:57,760
mission crs3

431
00:19:02,390 --> 00:19:00,880
will fly in february of of next year

432
00:19:04,710 --> 00:19:02,400
also from the cape this will be the

433
00:19:06,789 --> 00:19:04,720
first crs mission on the upgraded falcon

434
00:19:09,190 --> 00:19:06,799
9 launch vehicle

435
00:19:11,190 --> 00:19:09,200
so i wanted to thanks thank nasa again

436
00:19:13,590 --> 00:19:11,200
for the opportunity to participate in

437
00:19:15,430 --> 00:19:13,600
this extraordinary program um we are

438
00:19:16,470 --> 00:19:15,440

proud and we're honored to have been a

439
00:19:17,590 --> 00:19:16,480
part of it

440
00:19:22,470 --> 00:19:17,600
thanks

441
00:19:25,830 --> 00:19:24,070
i will turn it over to orbital sciences

442
00:19:27,510 --> 00:19:25,840
frank culbertson frank thank you very

443
00:19:29,110 --> 00:19:27,520
much trent and uh good morning to

444
00:19:31,430 --> 00:19:29,120
everybody um

445
00:19:33,270 --> 00:19:31,440
gwen said it very well the uh the key

446
00:19:36,070 --> 00:19:33,280
aspects of this program were the

447
00:19:38,950 --> 00:19:36,080
partnership aspect and the investment

448
00:19:40,470 --> 00:19:38,960
that both the companies and nasa

449
00:19:42,070 --> 00:19:40,480
as well as in our case the state of

450
00:19:43,750 --> 00:19:42,080
virginia had to put into this and to

451
00:19:46,310 --> 00:19:43,760
take a chance on this

452
00:19:48,470 --> 00:19:46,320
um it helped a lot that before we got

453
00:19:50,870 --> 00:19:48,480
too far along in the program nasa did

454
00:19:52,950 --> 00:19:50,880
put out a competition for contracts that

455
00:19:55,190 --> 00:19:52,960
gave us the incentive to really get this

456
00:19:57,590 --> 00:19:55,200
right because there was the potential

457
00:19:59,510 --> 00:19:57,600
for a services contract

458
00:20:02,149 --> 00:19:59,520
in the future

459
00:20:04,070 --> 00:20:02,159
an orbital had actually

460
00:20:05,110 --> 00:20:04,080
actually orbital was was founded on the

461
00:20:07,029 --> 00:20:05,120
premise of

462
00:20:09,029 --> 00:20:07,039
commercial access to space and our first

463
00:20:10,549 --> 00:20:09,039

rocket to do that was the pegasus and

464
00:20:13,510 --> 00:20:10,559
we've been doing that for almost 30

465
00:20:15,190 --> 00:20:13,520
years and so this was a great

466
00:20:16,870 --> 00:20:15,200
step in the in what we think is the

467
00:20:19,830 --> 00:20:16,880
right direction to commercialize a lot

468
00:20:21,669 --> 00:20:19,840
of aspects of what we do in space and as

469
00:20:23,029 --> 00:20:21,679
was said this model can be used for a

470
00:20:24,870 --> 00:20:23,039
lot of other

471
00:20:26,870 --> 00:20:24,880
projects programs and not just in the

472
00:20:28,630 --> 00:20:26,880
space program but it certainly is well

473
00:20:30,470 --> 00:20:28,640
suited for supporting the international

474
00:20:31,750 --> 00:20:30,480
space station and we think for

475
00:20:33,270 --> 00:20:31,760
exploration

476
00:20:35,029 --> 00:20:33,280
orbital had begun investing in the

477
00:20:36,390 --> 00:20:35,039
antares rocket

478
00:20:38,710 --> 00:20:36,400
before the

479
00:20:41,350 --> 00:20:38,720
beginning of the cots program as a

480
00:20:42,549 --> 00:20:41,360
medium class lift vehicle for replacing

481
00:20:44,870 --> 00:20:42,559
the delta ii

482
00:20:46,549 --> 00:20:44,880
and so it was a nice uh

483
00:20:48,230 --> 00:20:46,559
a nice move for nasa to come along with

484
00:20:49,270 --> 00:20:48,240
cuts so we'd have our first customer for

485
00:20:51,350 --> 00:20:49,280
it

486
00:20:53,830 --> 00:20:51,360
and of course that rocket has worked out

487
00:20:57,110 --> 00:20:53,840
very well and performed flawlessly on

488
00:20:59,190 --> 00:20:57,120

both of our first two flights

489
00:21:01,510 --> 00:20:59,200
we've got a great team

490
00:21:04,149 --> 00:21:01,520
at orbital who has learned a lot from

491
00:21:06,230 --> 00:21:04,159
nasa and our other partners but also has

492
00:21:08,390 --> 00:21:06,240
put a lot of innovation into into what

493
00:21:10,950 --> 00:21:08,400
we're doing and and learned to to be

494
00:21:13,029 --> 00:21:10,960
both efficient uh

495
00:21:15,430 --> 00:21:13,039
and cost effective while still being

496
00:21:18,310 --> 00:21:15,440
safe and reliable to support human space

497
00:21:20,070 --> 00:21:18,320
flight which is a different world

498
00:21:22,549 --> 00:21:20,080
than just what we've been doing in the

499
00:21:24,789 --> 00:21:22,559
past supporting communications satellite

500
00:21:27,510 --> 00:21:24,799
science satellites in the dod

501
00:21:29,350 --> 00:21:27,520
so it's a good direction to be moving

502
00:21:31,270 --> 00:21:29,360
as you know i firmly believe that human

503
00:21:33,350 --> 00:21:31,280
space flight is the foundation of

504
00:21:35,669 --> 00:21:33,360
continuing all of our space programs and

505
00:21:37,909 --> 00:21:35,679
continuing the future of nasa so we're

506
00:21:40,149 --> 00:21:37,919
very honored to be a part of supporting

507
00:21:42,230 --> 00:21:40,159
the iss and looking forward to it

508
00:21:44,470 --> 00:21:42,240
continuing for a long time and

509
00:21:46,950 --> 00:21:44,480
and other programs that come along

510
00:21:48,070 --> 00:21:46,960
um the requirements of this program were

511
00:21:50,710 --> 00:21:48,080
um

512
00:21:52,549 --> 00:21:50,720
were very serious for us to uh that we

513
00:21:53,909 --> 00:21:52,559

had to establish but the best thing was

514
00:21:55,750 --> 00:21:53,919
nasa let us establish our own

515
00:21:57,029 --> 00:21:55,760
requirements except when we were close

516
00:21:59,510 --> 00:21:57,039
to the station so we had to be

517
00:22:01,990 --> 00:21:59,520
responsible for our own success both on

518
00:22:04,470 --> 00:22:02,000
the launch vehicle and the spacecraft

519
00:22:06,630 --> 00:22:04,480
and and that taught us a lot uh we also

520
00:22:09,990 --> 00:22:06,640
had to learn a lot of flexibility um as

521
00:22:11,830 --> 00:22:10,000
did nasa in this case uh in some cases

522
00:22:13,430 --> 00:22:11,840
and and i think that's a good thing for

523
00:22:15,669 --> 00:22:13,440
industry to uh

524
00:22:17,830 --> 00:22:15,679
uh to to work with the government on on

525
00:22:19,350 --> 00:22:17,840
how to be more flexible in in arriving

526
00:22:20,789 --> 00:22:19,360
at solutions

527
00:22:25,750 --> 00:22:20,799
um

528
00:22:27,350 --> 00:22:25,760
for for both companies and for nasa

529
00:22:29,110 --> 00:22:27,360
because the space station does rely on

530
00:22:31,350 --> 00:22:29,120
this logistics train

531
00:22:32,870 --> 00:22:31,360
not just on us but we're going to be a

532
00:22:35,909 --> 00:22:32,880
larger and larger part of it going

533
00:22:37,510 --> 00:22:35,919
forward and so being able to establish a

534
00:22:40,710 --> 00:22:37,520
cost-effective

535
00:22:41,750 --> 00:22:40,720
supply chain our production plan is also

536
00:22:43,270 --> 00:22:41,760
important

537
00:22:45,190 --> 00:22:43,280
to both of us

538
00:22:46,950 --> 00:22:45,200

i want to thank our teammates

539
00:22:48,390 --> 00:22:46,960
mid-atlantic regional spaceport

540
00:22:51,270 --> 00:22:48,400
supported by virginia department of

541
00:22:53,270 --> 00:22:51,280
transportation has been invaluable in

542
00:22:54,950 --> 00:22:53,280
this in developing the launch pad and

543
00:22:57,909 --> 00:22:54,960
operating it for us

544
00:23:01,590 --> 00:22:57,919
nasa as a teammate not just in the cots

545
00:23:02,789 --> 00:23:01,600
program but also iss at wallops jsc ksc

546
00:23:05,350 --> 00:23:02,799
marshall

547
00:23:07,110 --> 00:23:05,360
many centers have contributed to

548
00:23:10,149 --> 00:23:07,120
the success of this with

549
00:23:11,990 --> 00:23:10,159
expertise advice and and uh

550
00:23:14,070 --> 00:23:12,000
and actually people occasionally to to

551
00:23:17,590 --> 00:23:14,080
come in and look at what we're doing

552
00:23:19,750 --> 00:23:17,600
um our teammates atk airjet yuzhinoya

553
00:23:21,510 --> 00:23:19,760
and tala selenia also have contributed

554
00:23:24,070 --> 00:23:21,520
greatly to the success success of this

555
00:23:25,510 --> 00:23:24,080
by providing us with great hardware that

556
00:23:27,510 --> 00:23:25,520
has worked well

557
00:23:29,669 --> 00:23:27,520
as many of you know we uh we named our

558
00:23:32,789 --> 00:23:29,679
first uh cygnus spacecraft to go to the

559
00:23:35,510 --> 00:23:32,799
station the g david lowe in honor of

560
00:23:37,590 --> 00:23:35,520
a former astronaut classmate of mine and

561
00:23:39,430 --> 00:23:37,600
a former orbital employee who actually

562
00:23:42,070 --> 00:23:39,440
was involved in the early days of of

563
00:23:43,909 --> 00:23:42,080

cots from the very beginning and who we

564
00:23:45,909 --> 00:23:43,919
lost a few years ago

565
00:23:47,830 --> 00:23:45,919
unfortunately but we were very proud to

566
00:23:49,510 --> 00:23:47,840
name that one the g david lowe

567
00:23:51,430 --> 00:23:49,520
our next one in order to continue the

568
00:23:52,710 --> 00:23:51,440
tradition will be named after c gordon

569
00:23:54,950 --> 00:23:52,720
fullerton

570
00:23:55,990 --> 00:23:54,960
gordo as most of us know

571
00:23:58,070 --> 00:23:56,000
know him

572
00:23:59,990 --> 00:23:58,080
was a two-time shuttle pilot

573
00:24:01,430 --> 00:24:00,000
a long time test pilot and research

574
00:24:03,190 --> 00:24:01,440
pilot at dryden

575
00:24:05,029 --> 00:24:03,200
but his connection with orbital was that

576
00:24:07,110 --> 00:24:05,039
he was the pilot of the b-52 that

577
00:24:09,590 --> 00:24:07,120
dropped our pegasus several times out

578
00:24:11,909 --> 00:24:09,600
there as we were developing that program

579
00:24:14,870 --> 00:24:11,919
and worked closely with us in helping

580
00:24:16,630 --> 00:24:14,880
make make that program a success and

581
00:24:17,909 --> 00:24:16,640
when we transitioned into the l-1011

582
00:24:19,990 --> 00:24:17,919
gordo was pretty happy about that

583
00:24:22,549 --> 00:24:20,000
because then he could fly the f-18 and

584
00:24:23,669 --> 00:24:22,559
not the heavy in order to to chase our

585
00:24:25,669 --> 00:24:23,679
our launches

586
00:24:28,549 --> 00:24:25,679
so um uh it's going to be an honor for

587
00:24:31,110 --> 00:24:28,559
us to name the the december 15th flight

588
00:24:32,789 --> 00:24:31,120

of cygnus after see gordon fullerton and

589
00:24:33,590 --> 00:24:32,799
continue that tradition

590
00:24:35,190 --> 00:24:33,600
uh

591
00:24:36,630 --> 00:24:35,200
mid-december is when our next one is

592
00:24:39,110 --> 00:24:36,640
scheduled the one after that should be

593
00:24:41,430 --> 00:24:39,120
in april or may and uh we're continuing

594
00:24:43,029 --> 00:24:41,440
with the uh with the production line and

595
00:24:45,190 --> 00:24:43,039
looking forward to many many more

596
00:24:47,430 --> 00:24:45,200
flights of supporting station we hope

597
00:24:53,029 --> 00:24:47,440
well beyond 2020.

598
00:24:55,830 --> 00:24:54,470
thanks frank uh we'll turn over the

599
00:24:58,310 --> 00:24:55,840
discussion to frank slaser of the

600
00:25:00,710 --> 00:24:58,320
aerospace industries association frank

601
00:25:02,149 --> 00:25:00,720
thank you uh some of you may wonder why

602
00:25:05,669 --> 00:25:02,159
i'm up here on this panel since i'm not

603
00:25:07,909 --> 00:25:05,679
a cox contractor or uh representing nasa

604
00:25:09,590 --> 00:25:07,919
but in fact the organization i work for

605
00:25:11,990 --> 00:25:09,600
represents about 90 percent of the us

606
00:25:13,350 --> 00:25:12,000
industry sales by dollar value and

607
00:25:15,909 --> 00:25:13,360
employs over three and a half million

608
00:25:17,269 --> 00:25:15,919
people and i can just uh here to really

609
00:25:19,190 --> 00:25:17,279
attest to the fact that this has been

610
00:25:21,430 --> 00:25:19,200
not only a benefit for nasa and for the

611
00:25:22,870 --> 00:25:21,440
cots companies but also for the space

612
00:25:24,710 --> 00:25:22,880
industrial base an industrial base

613
00:25:26,950 --> 00:25:24,720

that's increasingly under pressure as

614
00:25:29,190 --> 00:25:26,960
federal budget cutbacks and and

615
00:25:30,470 --> 00:25:29,200
shrinkages have caused uh difficulties

616
00:25:33,110 --> 00:25:30,480
for the industry

617
00:25:35,029 --> 00:25:33,120
uh cots has really also shown uh not

618
00:25:36,950 --> 00:25:35,039
just that these companies can can reach

619
00:25:38,789 --> 00:25:36,960
the space station but also that

620
00:25:40,070 --> 00:25:38,799
leadership in space by our nation isn't

621
00:25:42,149 --> 00:25:40,080
just something that happened in the past

622
00:25:43,350 --> 00:25:42,159
we can look back fondly on but our road

623
00:25:45,110 --> 00:25:43,360
to the future and something we're going

624
00:25:46,789 --> 00:25:45,120
to continue to excel in

625
00:25:49,350 --> 00:25:46,799
cots also showed the value of giving

626
00:25:52,149 --> 00:25:49,360
industry a greater role in accomplishing

627
00:25:54,950 --> 00:25:52,159
an objective again you look at the cost

628
00:25:57,350 --> 00:25:54,960
that was invested in cots well more than

629
00:25:59,190 --> 00:25:57,360
800 million dollars that's about what

630
00:26:01,350 --> 00:25:59,200
one shuttle flight used to cost and now

631
00:26:04,149 --> 00:26:01,360
we have two launch systems as well as

632
00:26:06,630 --> 00:26:04,159
two uh crews to be two uh cargo

633
00:26:09,350 --> 00:26:06,640
capabilities to bring materials up to

634
00:26:11,669 --> 00:26:09,360
the station and some materials back

635
00:26:12,870 --> 00:26:11,679
in addition to independent access uh

636
00:26:14,789 --> 00:26:12,880
because this

637
00:26:16,070 --> 00:26:14,799
these developments happened the united

638
00:26:18,630 --> 00:26:16,080

states is starting to see something that

639
00:26:20,789 --> 00:26:18,640
hasn't happened since the 1990s us

640
00:26:23,190 --> 00:26:20,799
satellite sales are being made and

641
00:26:25,510 --> 00:26:23,200
launches are being planned on cots

642
00:26:27,590 --> 00:26:25,520
vehicles so we're bringing back and from

643
00:26:29,350 --> 00:26:27,600
the future or to the future something we

644
00:26:31,029 --> 00:26:29,360
once did which was uh having a healthy

645
00:26:33,430 --> 00:26:31,039
launch industry and reestablishing our

646
00:26:36,470 --> 00:26:33,440
space transportation role

647
00:26:39,350 --> 00:26:36,480
the investment is also helping to

648
00:26:42,230 --> 00:26:39,360
facilitate nasa continuing to invest in

649
00:26:43,990 --> 00:26:42,240
the orion multi-purpose crew exploration

650
00:26:45,750 --> 00:26:44,000
vehicle as well as the space launch

651
00:26:47,269 --> 00:26:45,760
system this is an important thing

652
00:26:49,430 --> 00:26:47,279
because right now nasa's budget's under

653
00:26:50,789 --> 00:26:49,440
a lot of threat between sequestration as

654
00:26:52,789 --> 00:26:50,799
well as the overall decline in the

655
00:26:54,950 --> 00:26:52,799
federal spending right now so for nasa

656
00:26:57,590 --> 00:26:54,960
to get this very cost effective way to

657
00:27:01,350 --> 00:26:57,600
sustain iss to at least 2020 and

658
00:27:03,269 --> 00:27:01,360
hopefully beyond is very very important

659
00:27:05,110 --> 00:27:03,279
i'd also note that the cots is also

660
00:27:06,630 --> 00:27:05,120
helping to create more than just

661
00:27:09,350 --> 00:27:06,640
providing access the

662
00:27:11,350 --> 00:27:09,360
iss for nasa purposes it's enabling new

663
00:27:13,750 --> 00:27:11,360

industries and new users in academia and

664
00:27:15,909 --> 00:27:13,760
other locations in our society

665
00:27:18,710 --> 00:27:15,919
to utilize the iss national lab the

666
00:27:20,149 --> 00:27:18,720
international space station national lab

667
00:27:21,510 --> 00:27:20,159
and this is really going to be important

668
00:27:23,430 --> 00:27:21,520
because space station is a facility

669
00:27:24,870 --> 00:27:23,440
that's got great capabilities now we

670
00:27:27,350 --> 00:27:24,880
need to utilize them and that's starting

671
00:27:29,269 --> 00:27:27,360
to happen and cots is a big part of that

672
00:27:31,990 --> 00:27:29,279
in fact uh as an example in just three

673
00:27:35,110 --> 00:27:32,000
years of operations one new company's uh

674
00:27:36,389 --> 00:27:35,120
nanoracks llc has sent over 100 payloads

675
00:27:39,510 --> 00:27:36,399
to the international space station on

676
00:27:42,070 --> 00:27:39,520
behalf of customers ranging from uh 39

677
00:27:44,149 --> 00:27:42,080
school districts to advanced biopharma

678
00:27:45,909 --> 00:27:44,159
pharmaceutical companies

679
00:27:47,990 --> 00:27:45,919
u.s industry has invested and is

680
00:27:49,830 --> 00:27:48,000
investing capital and innovative ideas

681
00:27:51,110 --> 00:27:49,840
to support this new future and the

682
00:27:52,789 --> 00:27:51,120
government agencies and the congress

683
00:27:54,630 --> 00:27:52,799
that have created this program

684
00:27:56,789 --> 00:27:54,640
have also taken key steps to foster

685
00:27:58,470 --> 00:27:56,799
these new initiatives stability however

686
00:27:59,830 --> 00:27:58,480
is important going forward in the future

687
00:28:01,830 --> 00:27:59,840
these companies have invested their

688
00:28:03,029 --> 00:28:01,840

capital on behalf of a market that they

689
00:28:04,310 --> 00:28:03,039
need to have some assurance is going to

690
00:28:06,310 --> 00:28:04,320
be there in order to pay back their

691
00:28:07,669 --> 00:28:06,320
investors as well as to enable future

692
00:28:08,950 --> 00:28:07,679
capabilities to be developed in a

693
00:28:10,470 --> 00:28:08,960
similar way

694
00:28:12,389 --> 00:28:10,480
cots in the commercial cargo program

695
00:28:14,470 --> 00:28:12,399
have also successfully re-established

696
00:28:16,789 --> 00:28:14,480
u.s domestic domestic cargo access to

697
00:28:17,990 --> 00:28:16,799
the station and aia believes that kotz

698
00:28:19,909 --> 00:28:18,000
has pointed the way for nasa's

699
00:28:21,669 --> 00:28:19,919
commercial crew program as the most

700
00:28:24,070 --> 00:28:21,679
expedient way to now reestablish

701
00:28:25,190 --> 00:28:24,080
independent u.s crew access to the space

702
00:28:30,870 --> 00:28:25,200
station

703
00:28:34,549 --> 00:28:32,789
thanks so much frank so before we turn

704
00:28:36,230 --> 00:28:34,559
over the discussion to phil mcallister

705
00:28:37,750 --> 00:28:36,240
for for closing remarks i just want to

706
00:28:39,190 --> 00:28:37,760
show a short video that highlights some

707
00:28:40,630 --> 00:28:39,200
of the science we've been able to to

708
00:28:41,909 --> 00:28:40,640
conduct aboard the international space

709
00:28:43,830 --> 00:28:41,919
station some of the investigations were

710
00:28:46,070 --> 00:28:43,840
really excited to be able to send up

711
00:28:47,269 --> 00:28:46,080
these of course capabilities that have

712
00:28:49,909 --> 00:28:47,279
been enabled

713
00:28:51,909 --> 00:28:49,919

by our by our cots partners and current

714
00:29:05,029 --> 00:28:51,919
commercial resupply services providers

715
00:29:09,510 --> 00:29:07,029
the international space station is a

716
00:29:11,830 --> 00:29:09,520
convergence of science technology and

717
00:29:14,389 --> 00:29:11,840
human innovation and orbiting science

718
00:29:16,149 --> 00:29:14,399
lab where astronauts live work and

719
00:29:18,630 --> 00:29:16,159
prepare for even bolder human

720
00:29:21,190 --> 00:29:18,640
exploration missions with the retirement

721
00:29:23,269 --> 00:29:21,200
of the shuttle program nasa challenged

722
00:29:25,590 --> 00:29:23,279
american industry to provide safe

723
00:29:27,350 --> 00:29:25,600
reliable and affordable transportation

724
00:29:29,350 --> 00:29:27,360
to the space station in order to

725
00:29:32,230 --> 00:29:29,360
maintain u.s leadership in space

726
00:29:34,870 --> 00:29:32,240
exploration and scientific discovery

727
00:29:37,269 --> 00:29:34,880
nasa's commercial partners spacex and

728
00:29:39,510 --> 00:29:37,279
orbital scientists met that challenge

729
00:29:41,590 --> 00:29:39,520
ending our temporary reliance on others

730
00:29:43,990 --> 00:29:41,600
to resupply the station

731
00:29:45,510 --> 00:29:44,000
these american companies are delivering

732
00:29:47,269 --> 00:29:45,520
critical supplies and science

733
00:29:49,669 --> 00:29:47,279
experiments to the international space

734
00:29:51,830 --> 00:29:49,679
station that expand our understanding of

735
00:29:54,149 --> 00:29:51,840
the universe and clear the path for

736
00:29:55,190 --> 00:29:54,159
deeper human exploration into the solar

737
00:29:57,190 --> 00:29:55,200
system

738
00:29:59,669 --> 00:29:57,200

one recently returned investigation

739
00:30:01,909 --> 00:29:59,679
aboard a spacex dragon spacecraft was

740
00:30:04,310 --> 00:30:01,919
the coarsening and solid liquid mixtures

741
00:30:06,549 --> 00:30:04,320
experiment an important trial that will

742
00:30:08,870 --> 00:30:06,559
help american engineers back on earth

743
00:30:11,669 --> 00:30:08,880
develop even more durable and stronger

744
00:30:13,269 --> 00:30:11,679
materials for automobile aircraft and

745
00:30:15,750 --> 00:30:13,279
spacecraft parts

746
00:30:18,549 --> 00:30:15,760
the ability to deliver and return frozen

747
00:30:20,789 --> 00:30:18,559
space station cargo including biological

748
00:30:22,710 --> 00:30:20,799
samples is essential for scientists

749
00:30:25,190 --> 00:30:22,720
hoping to better understand how the

750
00:30:26,310 --> 00:30:25,200
human body can thrive in long-term space

751
00:30:28,710 --> 00:30:26,320
flight

752
00:30:31,350 --> 00:30:28,720
these and other important results gained

753
00:30:32,549 --> 00:30:31,360
in space also have direct benefits here

754
00:30:34,789 --> 00:30:32,559
on earth

755
00:30:36,950 --> 00:30:34,799
one experiment on human immune cells

756
00:30:39,269 --> 00:30:36,960
scheduled to fly next year requires

757
00:30:41,190 --> 00:30:39,279
astronauts to access samples very

758
00:30:43,909 --> 00:30:41,200
quickly after the cargo arrives to the

759
00:30:45,830 --> 00:30:43,919
space station space flight capabilities

760
00:30:47,909 --> 00:30:45,840
developed through the cots program make

761
00:30:50,389 --> 00:30:47,919
this experiment possible

762
00:30:52,230 --> 00:30:50,399
with hundreds of ongoing experiments the

763
00:30:55,510 --> 00:30:52,240

international space station will be a

764
00:30:57,669 --> 00:30:55,520
platform of discovery for years to come

765
00:30:59,669 --> 00:30:57,679
the amazing breakthroughs in scientific

766
00:31:01,909 --> 00:30:59,679
research will be made possible and

767
00:31:05,190 --> 00:31:01,919
carried aloft to the orbiting laboratory

768
00:31:06,710 --> 00:31:05,200
by nasa's american partners spacex and

769
00:31:08,710 --> 00:31:06,720
orbital sciences

770
00:31:11,669 --> 00:31:08,720
but the success of nasa's commercial

771
00:31:14,070 --> 00:31:11,679
cargo program is just beginning

772
00:31:16,149 --> 00:31:14,080
soon private american companies will be

773
00:31:19,269 --> 00:31:16,159
transporting our astronauts to the

774
00:31:20,230 --> 00:31:19,279
station on spacecraft launched from u.s

775
00:31:22,950 --> 00:31:20,240
soil

776
00:31:25,430 --> 00:31:22,960
thanks to american ingenuity and nasa's

777
00:31:32,630 --> 00:31:25,440
never say never attitude the future of

778
00:31:36,470 --> 00:31:34,470
and with that let's hear about uh what's

779
00:31:38,950 --> 00:31:36,480
what's next to come for uh american

780
00:31:40,149 --> 00:31:38,960
commercial space flight with nasa's uh

781
00:31:42,630 --> 00:31:40,159
director of commercial space flight

782
00:31:44,789 --> 00:31:42,640
development phil mcallister

783
00:31:47,430 --> 00:31:44,799
thanks trent uh for my remarks i'm gonna

784
00:31:49,190 --> 00:31:47,440
go a little off top off type

785
00:31:51,430 --> 00:31:49,200
and talk about the emotions that i've

786
00:31:52,630 --> 00:31:51,440
been feeling as cots have been coming to

787
00:31:54,149 --> 00:31:52,640
a close

788
00:31:56,870 --> 00:31:54,159

you know as engineers we like to talk

789
00:31:59,509 --> 00:31:56,880
about specific impulse and beta angles

790
00:32:01,350 --> 00:31:59,519
communications frequencies but

791
00:32:03,269 --> 00:32:01,360
i've been really struck by sort of the

792
00:32:05,269 --> 00:32:03,279
feelings that and the emotional aspects

793
00:32:06,710 --> 00:32:05,279
of what we have accomplished over these

794
00:32:08,710 --> 00:32:06,720
five or six years

795
00:32:11,509 --> 00:32:08,720
first and foremost obviously is a very

796
00:32:13,110 --> 00:32:11,519
strong sense of pride and accomplishment

797
00:32:15,509 --> 00:32:13,120
obviously the hardware that you've seen

798
00:32:17,590 --> 00:32:15,519
today very impressive uh the

799
00:32:18,950 --> 00:32:17,600
accomplishments of the program and the

800
00:32:20,549 --> 00:32:18,960
fact that we've been able to go all the

801
00:32:22,230 --> 00:32:20,559
way through the end

802
00:32:24,389 --> 00:32:22,240
that was one of the really uh true

803
00:32:26,149 --> 00:32:24,399
accomplishments as uh

804
00:32:27,590 --> 00:32:26,159
as aerospace professionals we've

805
00:32:29,990 --> 00:32:27,600
probably all been part of a program

806
00:32:31,590 --> 00:32:30,000
where you start it off you start to get

807
00:32:33,590 --> 00:32:31,600
invested in it and then for some reason

808
00:32:35,190 --> 00:32:33,600
it gets cancelled usually because of

809
00:32:36,389 --> 00:32:35,200
cost situations

810
00:32:37,669 --> 00:32:36,399
you kind of feel like you've been left

811
00:32:39,190 --> 00:32:37,679
at the altar

812
00:32:40,789 --> 00:32:39,200
but it was been great to see this

813
00:32:42,470 --> 00:32:40,799

program go all the way through i'm

814
00:32:44,950 --> 00:32:42,480
convinced that one of the keys was the

815
00:32:46,549 --> 00:32:44,960
cost effectiveness of this program and

816
00:32:48,070 --> 00:32:46,559
that enabled it to get all the way

817
00:32:49,110 --> 00:32:48,080
through to the end

818
00:32:50,950 --> 00:32:49,120
um

819
00:32:52,549 --> 00:32:50,960
also i'm very proud of nasa i have to

820
00:32:54,389 --> 00:32:52,559
say i'm obviously proud of our partners

821
00:32:57,190 --> 00:32:54,399
and what they were able to accomplish

822
00:32:59,190 --> 00:32:57,200
um but uh we haven't always been a good

823
00:33:00,710 --> 00:32:59,200
partner in the past and i think through

824
00:33:03,110 --> 00:33:00,720
the cots efforts that we've shown that

825
00:33:05,269 --> 00:33:03,120
nasa can be a good partner

826
00:33:07,430 --> 00:33:05,279
we were able to step back

827
00:33:09,350 --> 00:33:07,440
and let our partners take the lead on

828
00:33:11,430 --> 00:33:09,360
the development of these systems and

829
00:33:12,310 --> 00:33:11,440
also being able to adapt to two very

830
00:33:13,830 --> 00:33:12,320
different

831
00:33:16,470 --> 00:33:13,840
companies i wasn't quite sure how that

832
00:33:17,990 --> 00:33:16,480
would go um the companies have very

833
00:33:20,310 --> 00:33:18,000
different business approaches they have

834
00:33:21,830 --> 00:33:20,320
different cultures and nasa was able to

835
00:33:23,830 --> 00:33:21,840
adapt uh

836
00:33:26,149 --> 00:33:23,840
to those uh

837
00:33:27,990 --> 00:33:26,159
and enable them to thrive and also the

838
00:33:30,230 --> 00:33:28,000

overall program to

839
00:33:32,230 --> 00:33:30,240
thrive as well so i've had a very strong

840
00:33:34,630 --> 00:33:32,240
feeling of accomplishment and pride

841
00:33:37,110 --> 00:33:34,640
because of that also i have to say it's

842
00:33:39,029 --> 00:33:37,120
tinged with a lot of sadness to see it

843
00:33:41,590 --> 00:33:39,039
finally come to a close it's been a wild

844
00:33:43,750 --> 00:33:41,600
ride there have been a lot of challenges

845
00:33:45,750 --> 00:33:43,760
that have been overcome over the years

846
00:33:47,990 --> 00:33:45,760
and many of us that have worked together

847
00:33:50,149 --> 00:33:48,000
now for over six years we've come to

848
00:33:51,669 --> 00:33:50,159
know each other respect each other and

849
00:33:53,830 --> 00:33:51,679
rely on each other which was one of the

850
00:33:55,909 --> 00:33:53,840
keys to the partnership so it's kind of

851
00:33:58,470 --> 00:33:55,919
sad to see this come to an end but i

852
00:34:00,149 --> 00:33:58,480
have to say that the sadness is very

853
00:34:01,830 --> 00:34:00,159
much tempered by

854
00:34:03,029 --> 00:34:01,840
hope and optimism which is what i'm

855
00:34:05,110 --> 00:34:03,039
feeling

856
00:34:07,750 --> 00:34:05,120
most when i look forward

857
00:34:09,829 --> 00:34:07,760
the future that has been enabled

858
00:34:11,909 --> 00:34:09,839
by the cots program we can now get the

859
00:34:13,109 --> 00:34:11,919
most out of the international space

860
00:34:14,950 --> 00:34:13,119
station

861
00:34:16,909 --> 00:34:14,960
we are no longer going to be constrained

862
00:34:19,349 --> 00:34:16,919
by our upmass capability and the

863
00:34:21,589 --> 00:34:19,359

productivity of that national lab can

864
00:34:24,069 --> 00:34:21,599
finally come to full fruition so i'm

865
00:34:26,149 --> 00:34:24,079
really excited about that

866
00:34:28,149 --> 00:34:26,159
and even more so we now have a template

867
00:34:30,470 --> 00:34:28,159
for how to do a non-traditional program

868
00:34:33,030 --> 00:34:30,480
using public-private partnerships

869
00:34:35,030 --> 00:34:33,040
those have been very difficult and now

870
00:34:36,790 --> 00:34:35,040
like allen said every every program is

871
00:34:38,869 --> 00:34:36,800
different it's not the right model for

872
00:34:41,589 --> 00:34:38,879
everything but we certainly have a

873
00:34:44,149 --> 00:34:41,599
successful template that future programs

874
00:34:46,069 --> 00:34:44,159
and future program managers can go to

875
00:34:48,629 --> 00:34:46,079
and say how did they do that how did

876
00:34:50,069 --> 00:34:48,639
that work and maybe apply that to future

877
00:34:51,750 --> 00:34:50,079
endeavors

878
00:34:53,349 --> 00:34:51,760
i think with the budget challenges that

879
00:34:56,950 --> 00:34:53,359
we are all facing

880
00:34:58,870 --> 00:34:56,960
partnerships are going to be critical

881
00:35:00,390 --> 00:34:58,880
for all of our future space endeavors

882
00:35:02,710 --> 00:35:00,400
we're going to have to do more of that

883
00:35:04,150 --> 00:35:02,720
and seeing the success of cots i think

884
00:35:06,069 --> 00:35:04,160
has given us the

885
00:35:08,710 --> 00:35:06,079
confidence to be able to do more of

886
00:35:10,950 --> 00:35:08,720
those partnerships uh certainly

887
00:35:13,109 --> 00:35:10,960
it was critical for enabling commercial

888
00:35:16,790 --> 00:35:13,119

crew

889
00:35:19,750 --> 00:35:16,800
that um the the success that cots had

890
00:35:21,510 --> 00:35:19,760
exhibited um even early on gave policy

891
00:35:23,109 --> 00:35:21,520
makers and nasa the confidence to be

892
00:35:24,870 --> 00:35:23,119
able to say yes i think we can do this

893
00:35:26,470 --> 00:35:24,880
with commercial crew and if you look at

894
00:35:29,109 --> 00:35:26,480
commercial crew

895
00:35:30,950 --> 00:35:29,119
most of the critical key aspects of cots

896
00:35:32,310 --> 00:35:30,960
have been adapted by crew

897
00:35:33,829 --> 00:35:32,320
we're using pay for performance

898
00:35:35,829 --> 00:35:33,839
milestones we're using space act

899
00:35:37,829 --> 00:35:35,839
agreements for the initial rounds of

900
00:35:39,910 --> 00:35:37,839
development we're having skin in the

901
00:35:41,510 --> 00:35:39,920
game competition all those features that

902
00:35:43,030 --> 00:35:41,520
alan mentioned that were key to the

903
00:35:44,870 --> 00:35:43,040
success of cots

904
00:35:47,349 --> 00:35:44,880
we are adapting and using in commercial

905
00:35:50,310 --> 00:35:47,359
crew and hope to be using that in the

906
00:35:52,390 --> 00:35:50,320
future so uh that's i think that's the

907
00:35:54,230 --> 00:35:52,400
final feeling that i have is the hope

908
00:35:59,990 --> 00:35:54,240
and optimism that i see for the future

909
00:36:03,109 --> 00:36:01,750
thanks girl

910
00:36:04,630 --> 00:36:03,119
let's go ahead and start a question and

911
00:36:05,829 --> 00:36:04,640
answer session uh we'll start here in

912
00:36:08,790 --> 00:36:05,839
the room and then we'll go to the phone

913
00:36:11,190 --> 00:36:08,800

line and do we have any questions here

914
00:36:14,310 --> 00:36:13,430
hi everybody

915
00:36:16,950 --> 00:36:14,320
yeah

916
00:36:18,710 --> 00:36:16,960
dan leone with space news i have uh one

917
00:36:20,870 --> 00:36:18,720
backward-looking question which i think

918
00:36:22,630 --> 00:36:20,880
has i think that other entrepreneurial

919
00:36:24,150 --> 00:36:22,640
space people who are watching may be

920
00:36:27,430 --> 00:36:24,160
interested to know the answer to and one

921
00:36:29,510 --> 00:36:27,440
very forward-looking one for allen

922
00:36:32,069 --> 00:36:29,520
much has been made about nasa's role as

923
00:36:33,589 --> 00:36:32,079
a critical anchor customer and alan you

924
00:36:34,710 --> 00:36:33,599
said you were convinced these companies

925
00:36:37,349 --> 00:36:34,720
were going to go ahead and build these

926
00:36:39,670 --> 00:36:37,359
vehicles no matter what you guys did and

927
00:36:42,310 --> 00:36:39,680
i'm curious the concepts definitely

928
00:36:44,390 --> 00:36:42,320
predate the cots program but i wonder if

929
00:36:47,030 --> 00:36:44,400
nasa had not showed up

930
00:36:48,790 --> 00:36:47,040
do do you spacex in orbital think that

931
00:36:50,550 --> 00:36:48,800
at this point you would have had

932
00:36:51,829 --> 00:36:50,560
multiple successful demonstration

933
00:36:53,589 --> 00:36:51,839
flights of the vehicles you were

934
00:36:56,310 --> 00:36:53,599
developing or

935
00:36:59,589 --> 00:36:57,990
well that's a little bit of a tough

936
00:37:02,310 --> 00:36:59,599
question because once we got these

937
00:37:05,030 --> 00:37:02,320
contracts we focused on them

938
00:37:08,230 --> 00:37:05,040

and but i do think that having nasa as

939
00:37:11,430 --> 00:37:08,240
our initial partner on cots and then

940
00:37:13,829 --> 00:37:11,440
having them as our first customer

941
00:37:15,349 --> 00:37:13,839
i won't speak for for gwen but in our

942
00:37:16,710 --> 00:37:15,359
case i think was essential because there

943
00:37:18,790 --> 00:37:16,720
were a lot of new things we had to learn

944
00:37:21,109 --> 00:37:18,800
about getting to the space station and

945
00:37:22,790 --> 00:37:21,119
accomplishing a mission

946
00:37:25,270 --> 00:37:22,800
that included a rendezvous in grappa

947
00:37:26,790 --> 00:37:25,280
with a human occupied

948
00:37:28,310 --> 00:37:26,800
vehicle

949
00:37:29,990 --> 00:37:28,320
now we could have developed antares and

950
00:37:32,069 --> 00:37:30,000
flown it for other purposes for other

951
00:37:33,109 --> 00:37:32,079
customers i think there is a market for

952
00:37:37,109 --> 00:37:33,119
that

953
00:37:39,349 --> 00:37:37,119
our ability to succeed was enhanced by

954
00:37:42,710 --> 00:37:39,359
the partnership with nasa the goals that

955
00:37:44,470 --> 00:37:42,720
were set by the program helped us and um

956
00:37:46,470 --> 00:37:44,480
if i could just add i'd like to also

957
00:37:48,470 --> 00:37:46,480
thank nasa and charlie to for that award

958
00:37:49,829 --> 00:37:48,480
today our team is going to be very proud

959
00:37:51,109 --> 00:37:49,839
of that and

960
00:37:52,790 --> 00:37:51,119
they did the work and i'll be happy to

961
00:37:54,550 --> 00:37:52,800
deliver it back to them and i'm sure

962
00:37:57,030 --> 00:37:54,560
gwen feels the same way

963
00:38:02,790 --> 00:38:00,470

so we were working on uh

964
00:38:04,950 --> 00:38:02,800
an eelv class launch vehicle and we also

965
00:38:07,190 --> 00:38:04,960
were working on a capsule prior to the

966
00:38:09,510 --> 00:38:07,200
cots program

967
00:38:11,670 --> 00:38:09,520
i don't think we would have done as much

968
00:38:13,270 --> 00:38:11,680
as we did in the time frame that we did

969
00:38:15,349 --> 00:38:13,280
without nasa's support as a matter of

970
00:38:16,390 --> 00:38:15,359
fact i'm pretty sure i can say with

971
00:38:17,910 --> 00:38:16,400
confidence

972
00:38:19,910 --> 00:38:17,920
that we would not have done what we've

973
00:38:22,870 --> 00:38:19,920
done in this time frame so nasa's

974
00:38:25,910 --> 00:38:22,880
support was essential uh to our

975
00:38:30,470 --> 00:38:25,920
developing this system um and uh and

976
00:38:35,190 --> 00:38:33,030
we just learned that cots has

977
00:38:36,870 --> 00:38:35,200
been successful but perhaps not for for

978
00:38:37,910 --> 00:38:36,880
every other program

979
00:38:39,990 --> 00:38:37,920
but do you

980
00:38:42,150 --> 00:38:40,000
for example what programs might it be

981
00:38:43,910 --> 00:38:42,160
appropriate for in the realm of human

982
00:38:45,510 --> 00:38:43,920
exploration going forward are there any

983
00:38:47,109 --> 00:38:45,520
serious inklings within nasa have they

984
00:38:48,870 --> 00:38:47,119
already reassigned you somewhere to make

985
00:38:50,470 --> 00:38:48,880
this work for something else can you can

986
00:38:52,390 --> 00:38:50,480
you tell us

987
00:38:54,230 --> 00:38:52,400
how it might come to pass as phil said

988
00:38:55,990 --> 00:38:54,240

that another program manager picks this

989
00:38:58,550 --> 00:38:56,000
approach up right

990
00:39:02,710 --> 00:38:58,560
well i think it's very important that uh

991
00:39:06,710 --> 00:39:04,710
chat breaks through the challenges of

992
00:39:09,670 --> 00:39:06,720
the new technologies that are required

993
00:39:11,589 --> 00:39:09,680
to explore outside

994
00:39:13,190 --> 00:39:11,599
of earth's boundaries in the low earth

995
00:39:15,829 --> 00:39:13,200
orbit and then going deeper and deeper

996
00:39:17,750 --> 00:39:15,839
into space to the moon and beyond so

997
00:39:21,750 --> 00:39:17,760
nasa is

998
00:39:23,910 --> 00:39:21,760
it is a governmental effort to to to to

999
00:39:27,030 --> 00:39:23,920
tackle those new technologies

1000
00:39:28,710 --> 00:39:27,040
then turn it over to industry who is set

1001
00:39:31,589 --> 00:39:28,720
up to operate

1002
00:39:34,950 --> 00:39:31,599
these systems in a more cost-effective

1003
00:39:36,550 --> 00:39:34,960
manner that that's just a a natural fit

1004
00:39:38,470 --> 00:39:36,560
so i think that's a very important part

1005
00:39:40,950 --> 00:39:38,480
of the model for for nasa and the

1006
00:39:43,030 --> 00:39:40,960
government to blaze the trail and then

1007
00:39:44,870 --> 00:39:43,040
turn it over for operational of any

1008
00:39:48,069 --> 00:39:44,880
existing technology so i think that's

1009
00:39:50,230 --> 00:39:48,079
really key uh we shouldn't ask uh expect

1010
00:39:53,670 --> 00:39:50,240
private companies to have you know just

1011
00:39:56,150 --> 00:39:53,680
breakthrough technologies uh

1012
00:39:57,430 --> 00:39:56,160
that that's not i don't think that's a

1013
00:39:59,670 --> 00:39:57,440

key ingredient a key ingredient that

1014
00:40:01,990 --> 00:39:59,680
models of the model is to to not have

1015
00:40:04,390 --> 00:40:02,000
that requirement which and if you look

1016
00:40:06,630 --> 00:40:04,400
at history you can there are cases that

1017
00:40:08,550 --> 00:40:06,640
have failed because the technology

1018
00:40:09,430 --> 00:40:08,560
challenge which is too great

1019
00:40:10,470 --> 00:40:09,440
um

1020
00:40:12,630 --> 00:40:10,480
in july

1021
00:40:15,190 --> 00:40:12,640
we sent out a synopsis requesting

1022
00:40:18,710 --> 00:40:15,200
information for ideas from industry on

1023
00:40:20,710 --> 00:40:18,720
how the model could be extended and

1024
00:40:23,270 --> 00:40:20,720
what are on the minds of our industry

1025
00:40:25,270 --> 00:40:23,280
partners today for helping nasa

1026
00:40:26,790 --> 00:40:25,280
complete our exploration goals and there

1027
00:40:29,430 --> 00:40:26,800
is a great deal of

1028
00:40:32,710 --> 00:40:29,440
great responses

1029
00:40:35,750 --> 00:40:32,720
systems to go back and explore the moon

1030
00:40:38,150 --> 00:40:35,760
communication systems propellant systems

1031
00:40:40,870 --> 00:40:38,160
launch systems

1032
00:40:43,670 --> 00:40:40,880
there's all kinds of potential out there

1033
00:40:45,990 --> 00:40:43,680
where the model can be used and i think

1034
00:40:49,030 --> 00:40:46,000
it it can be used

1035
00:40:51,030 --> 00:40:49,040
in a complementary manner

1036
00:40:53,349 --> 00:40:51,040
nasa develops the you know high

1037
00:40:55,670 --> 00:40:53,359
technology systems and then

1038
00:40:57,430 --> 00:40:55,680

the systems that uh

1039
00:41:00,710 --> 00:40:57,440
are less complex

1040
00:41:02,390 --> 00:41:00,720
uh can be uh turned over to industry so

1041
00:41:04,710 --> 00:41:02,400
i think that's the way uh to look

1042
00:41:07,030 --> 00:41:04,720
forward it's just to keep keep looking

1043
00:41:09,510 --> 00:41:07,040
for those uh opportunities where we can

1044
00:41:12,230 --> 00:41:09,520
work together to create uh and and

1045
00:41:13,910 --> 00:41:12,240
achieve our goals

1046
00:41:15,750 --> 00:41:13,920
let me let me jump to the phone line

1047
00:41:19,270 --> 00:41:15,760
here and we'll start with uh tarek malik

1048
00:41:22,790 --> 00:41:20,630
thank you uh uh

1049
00:41:25,349 --> 00:41:22,800
i have a question i i think about

1050
00:41:27,510 --> 00:41:25,359
looking ahead for uh for gwen and and

1051
00:41:30,550 --> 00:41:27,520
for frank you know glenn i'm wondering

1052
00:41:31,910 --> 00:41:30,560
what uh spacex learned um you know from

1053
00:41:34,630 --> 00:41:31,920
the cots program that you've been able

1054
00:41:37,190 --> 00:41:34,640
to apply to crs and maybe like one or

1055
00:41:39,510 --> 00:41:37,200
two kind of vital lessons in in

1056
00:41:41,910 --> 00:41:39,520
developing the dragon spacecraft

1057
00:41:43,750 --> 00:41:41,920
and for frank i'm wondering how um you

1058
00:41:44,950 --> 00:41:43,760
know the process has informed what your

1059
00:41:46,950 --> 00:41:44,960
plans are for

1060
00:41:49,670 --> 00:41:46,960
uh for sickness um

1061
00:41:53,829 --> 00:41:49,680
and terry's on on a non-nasa commercial

1062
00:41:53,839 --> 00:41:58,790
okay good question hard to answer um

1063
00:42:03,510 --> 00:42:01,270

you know i think uh the

1064
00:42:04,630 --> 00:42:03,520
there were a couple of lessons that we

1065
00:42:05,910 --> 00:42:04,640
that we learned during the cots

1066
00:42:08,309 --> 00:42:05,920
development program i don't know whether

1067
00:42:10,309 --> 00:42:08,319
they'd be specifically applicable to crs

1068
00:42:13,190 --> 00:42:10,319
but uh certainly to other programs going

1069
00:42:15,030 --> 00:42:13,200
forward um spacex is an organization

1070
00:42:17,430 --> 00:42:15,040
that loves to test

1071
00:42:19,349 --> 00:42:17,440
and we we test enormously at the

1072
00:42:20,790 --> 00:42:19,359
component level uh certainly on the

1073
00:42:23,030 --> 00:42:20,800
vehicles we go to the subsystem all the

1074
00:42:25,190 --> 00:42:23,040
way up to the system level for dragon

1075
00:42:27,030 --> 00:42:25,200
kind of given where we were

1076
00:42:28,870 --> 00:42:27,040
with the funding that was available both

1077
00:42:31,109 --> 00:42:28,880
at spacex and from nasa

1078
00:42:32,550 --> 00:42:31,119
we had with purpose cut out a lot of

1079
00:42:36,150 --> 00:42:32,560
system tests

1080
00:42:38,069 --> 00:42:36,160
dragon and we're relying more heavily on

1081
00:42:41,510 --> 00:42:38,079
the component level tests very much like

1082
00:42:44,230 --> 00:42:41,520
the iridium uh model actually um and we

1083
00:42:46,550 --> 00:42:44,240
found uh when we did decide to to pull

1084
00:42:49,670 --> 00:42:46,560
back some of those big system tests we

1085
00:42:51,349 --> 00:42:49,680
did find that we learned a lot so um

1086
00:42:53,750 --> 00:42:51,359
we'll continue to do those big system

1087
00:42:55,670 --> 00:42:53,760
tests on on our launcher systems going

1088
00:42:57,349 --> 00:42:55,680

forward that's always been the plan

1089
00:43:00,069 --> 00:42:57,359
and certainly will continue to drive

1090
00:43:02,390 --> 00:43:00,079
large system testing uh on the on the

1091
00:43:03,829 --> 00:43:02,400
capsule side as well

1092
00:43:06,230 --> 00:43:03,839
i only gave you one lesson learned i

1093
00:43:09,270 --> 00:43:06,240
cheated there sorry tarik

1094
00:43:11,349 --> 00:43:09,280
you want more no you go

1095
00:43:13,030 --> 00:43:11,359
another valuable lesson learned in cots

1096
00:43:15,750 --> 00:43:13,040
that carries over into crs is the

1097
00:43:17,589 --> 00:43:15,760
relationship between the company and uh

1098
00:43:19,270 --> 00:43:17,599
and our other partners including nasa

1099
00:43:20,470 --> 00:43:19,280
and the state of virginia

1100
00:43:22,790 --> 00:43:20,480
we've had to work through a lot of

1101
00:43:25,190 --> 00:43:22,800
issues uh and sometimes very intense

1102
00:43:27,589 --> 00:43:25,200
issues related to cost schedule and

1103
00:43:28,470 --> 00:43:27,599
technical performance that um have paved

1104
00:43:31,990 --> 00:43:28,480
the way

1105
00:43:34,390 --> 00:43:32,000
operate in the future even the fact that

1106
00:43:36,230 --> 00:43:34,400
we had to

1107
00:43:37,589 --> 00:43:36,240
abandon our approach on the first

1108
00:43:39,910 --> 00:43:37,599
attempt

1109
00:43:41,349 --> 00:43:39,920
of the demo mission and come back around

1110
00:43:42,710 --> 00:43:41,359
and try it again

1111
00:43:45,670 --> 00:43:42,720
allowed us to

1112
00:43:47,030 --> 00:43:45,680
basically do a major simulation in space

1113
00:43:49,109 --> 00:43:47,040

of of the

1114
00:43:51,190 --> 00:43:49,119
management team the technical teams and

1115
00:43:52,790 --> 00:43:51,200
the engineering teams

1116
00:43:54,150 --> 00:43:52,800
making sure that we all agreed on how we

1117
00:43:55,990 --> 00:43:54,160
were solving this problem what we were

1118
00:43:57,910 --> 00:43:56,000
going to do next and what the procedures

1119
00:44:00,230 --> 00:43:57,920
were in a very efficient way and i think

1120
00:44:01,750 --> 00:44:00,240
that that will allow us to deal with any

1121
00:44:03,670 --> 00:44:01,760
other problems that might come up in the

1122
00:44:06,069 --> 00:44:03,680
in the future as far as how we're going

1123
00:44:07,829 --> 00:44:06,079
to use cygnus in the future and antares

1124
00:44:09,670 --> 00:44:07,839
we are negotiating with several

1125
00:44:11,349 --> 00:44:09,680
companies for carrying other payloads

1126
00:44:12,790 --> 00:44:11,359
into space but we already have

1127
00:44:15,589 --> 00:44:12,800
commitments from uh from other

1128
00:44:18,630 --> 00:44:15,599
organizations to add payloads um

1129
00:44:20,150 --> 00:44:18,640
secondary payloads to the cygnus and um

1130
00:44:21,589 --> 00:44:20,160
a couple of flights down the road we

1131
00:44:23,829 --> 00:44:21,599
will be doing a

1132
00:44:26,309 --> 00:44:23,839
conducting experiment for glenn research

1133
00:44:27,510 --> 00:44:26,319
center to evaluate fire propagation and

1134
00:44:31,349 --> 00:44:27,520
extinguish

1135
00:44:32,550 --> 00:44:31,359
we undock from the station

1136
00:44:33,270 --> 00:44:32,560
that's the plan

1137
00:44:36,230 --> 00:44:33,280
and

1138
00:44:38,230 --> 00:44:36,240

secondary payloads that could be

1139
00:44:40,710 --> 00:44:38,240
installed on either the outside or the

1140
00:44:42,870 --> 00:44:40,720
inside and conducted following the cargo

1141
00:44:45,430 --> 00:44:42,880
delivery so we think there's lots of

1142
00:44:47,030 --> 00:44:45,440
opportunity for that as well as

1143
00:44:49,270 --> 00:44:47,040
as the exploration

1144
00:44:51,349 --> 00:44:49,280
asteroid retrieval and lunar missions

1145
00:44:53,030 --> 00:44:51,359
develop in in the future they're going

1146
00:44:54,870 --> 00:44:53,040
to need cargo they're going to need

1147
00:44:56,870 --> 00:44:54,880
modules they're going to need support

1148
00:44:59,430 --> 00:44:56,880
from companies like ours to

1149
00:45:02,550 --> 00:44:59,440
to be able to conduct those missions in

1150
00:45:06,790 --> 00:45:05,349
thank you okay let me take two more from

1151
00:45:08,069 --> 00:45:06,800
the phone if there are any further

1152
00:45:09,589 --> 00:45:08,079
questions here in the audience just just

1153
00:45:10,790 --> 00:45:09,599
shoot a hand up as we take these two and

1154
00:45:13,910 --> 00:45:10,800
i'll come back to you but uh let's go

1155
00:45:16,390 --> 00:45:13,920
with alan boyle and msnbc god allen

1156
00:45:17,990 --> 00:45:16,400
thank you uh i guess this might be for

1157
00:45:19,910 --> 00:45:18,000
alan or

1158
00:45:22,550 --> 00:45:19,920
whoever else wants to

1159
00:45:24,790 --> 00:45:22,560
respond to this idea of

1160
00:45:26,550 --> 00:45:24,800
going forward administrator bolden

1161
00:45:28,069 --> 00:45:26,560
talked about how congress really needed

1162
00:45:30,309 --> 00:45:28,079
to support

1163
00:45:32,390 --> 00:45:30,319

the crew development program at the

1164
00:45:33,910 --> 00:45:32,400
requested level in order to make uh

1165
00:45:37,190 --> 00:45:33,920
2017.

1166
00:45:39,910 --> 00:45:37,200
uh why if cots was such a success is it

1167
00:45:44,150 --> 00:45:39,920
such a hard sell to get the sort of

1168
00:45:47,670 --> 00:45:44,160
money that nasa is looking for and and

1169
00:45:51,030 --> 00:45:47,680
what would be the impact if uh the

1170
00:45:54,309 --> 00:45:51,040
funding level was not at uh what the

1171
00:45:57,910 --> 00:45:54,319
administration wants how much would that

1172
00:46:05,190 --> 00:45:57,920
affect the development programs for uh

1173
00:46:08,870 --> 00:46:07,030
so i can't can't speak for congress

1174
00:46:10,790 --> 00:46:08,880
obviously it's a very difficult budget

1175
00:46:12,470 --> 00:46:10,800
environment for all discretionary

1176
00:46:14,309 --> 00:46:12,480
programs

1177
00:46:16,550 --> 00:46:14,319
and we're going to see that continue in

1178
00:46:18,710 --> 00:46:16,560
the future which is why uh programs like

1179
00:46:21,109 --> 00:46:18,720
cots become so critical for the pope in

1180
00:46:23,349 --> 00:46:21,119
the portfolio of the agency um going

1181
00:46:24,870 --> 00:46:23,359
forward we've we've said this very many

1182
00:46:27,270 --> 00:46:24,880
times uh

1183
00:46:29,829 --> 00:46:27,280
uh less money means we go slower than we

1184
00:46:31,750 --> 00:46:29,839
would like to like to go it's it's a

1185
00:46:33,510 --> 00:46:31,760
pretty straightforward equation we kind

1186
00:46:35,510 --> 00:46:33,520
of think we know how much money it's

1187
00:46:37,109 --> 00:46:35,520
going to take and if it's

1188
00:46:38,069 --> 00:46:37,119

less money over a longer period of time

1189
00:46:39,030 --> 00:46:38,079
it's going to take us a little bit

1190
00:46:40,470 --> 00:46:39,040
longer

1191
00:46:41,910 --> 00:46:40,480
but we're committed to getting the

1192
00:46:43,589 --> 00:46:41,920
program done

1193
00:46:44,950 --> 00:46:43,599
as soon as possible

1194
00:46:46,550 --> 00:46:44,960
and bring

1195
00:46:48,390 --> 00:46:46,560
that capability back to the united

1196
00:46:49,670 --> 00:46:48,400
states so we are going to continue

1197
00:46:51,910 --> 00:46:49,680
pushing our industry partners are

1198
00:46:53,829 --> 00:46:51,920
hitting their milestones in a very good

1199
00:46:56,309 --> 00:46:53,839
fashion

1200
00:46:58,950 --> 00:46:56,319
but all of our programs here at nasa uh

1201
00:47:00,390 --> 00:46:58,960
are are under some degree of stress

1202
00:47:04,309 --> 00:47:00,400
so it's not unique to the commercial

1203
00:47:08,230 --> 00:47:06,150
anything further alan

1204
00:47:09,270 --> 00:47:08,240
and did gwen have any thoughts about

1205
00:47:11,190 --> 00:47:09,280
what the

1206
00:47:13,829 --> 00:47:11,200
future development might be for the crew

1207
00:47:17,750 --> 00:47:13,839
capable of falcon with or without

1208
00:47:23,910 --> 00:47:20,630
well we were founded to uh and we've

1209
00:47:25,190 --> 00:47:23,920
architected all our systems to to carry

1210
00:47:26,790 --> 00:47:25,200
crew

1211
00:47:28,470 --> 00:47:26,800
we certainly would like to move forward

1212
00:47:30,630 --> 00:47:28,480
with the crew development in partnership

1213
00:47:33,349 --> 00:47:30,640

with nasa um i think it's in our

1214
00:47:35,829 --> 00:47:33,359
genetics to do it regardless

1215
00:47:37,349 --> 00:47:35,839
it will take substantially longer and it

1216
00:47:39,030 --> 00:47:37,359
probably won't meet the requirements

1217
00:47:41,109 --> 00:47:39,040
that nasa has

1218
00:47:43,270 --> 00:47:41,119
to be able to leverage the system

1219
00:47:44,950 --> 00:47:43,280
i don't alan i apologize i don't want to

1220
00:47:49,030 --> 00:47:44,960
hazard a guess as to how long it would

1221
00:47:53,190 --> 00:47:51,190
i i really would like to

1222
00:47:54,390 --> 00:47:53,200
just try to continue to cheerlead for an

1223
00:47:58,870 --> 00:47:54,400
overall

1224
00:48:02,710 --> 00:48:00,549
you know nasa does an extraordinary

1225
00:48:04,790 --> 00:48:02,720
amount of work for 16 or 17 billion

1226
00:48:07,349 --> 00:48:04,800
dollars a year i just want to give you a

1227
00:48:09,109 --> 00:48:07,359
little tidbit of information um

1228
00:48:10,470 --> 00:48:09,119
americans spend a hundred billion

1229
00:48:15,109 --> 00:48:10,480
dollars a year

1230
00:48:15,119 --> 00:48:17,990
i'll drink to that

1231
00:48:22,150 --> 00:48:19,670
thanks alan all right let's move on to

1232
00:48:24,309 --> 00:48:22,160
irene klotz discovery

1233
00:48:26,870 --> 00:48:24,319
hi um thanks very much i have three

1234
00:48:28,069 --> 00:48:26,880
questions uh the first for phil i'm kind

1235
00:48:29,270 --> 00:48:28,079
of following up what you were just

1236
00:48:31,430 --> 00:48:29,280
saying about

1237
00:48:35,190 --> 00:48:31,440
commercial crew

1238
00:48:37,349 --> 00:48:35,200

given what you've learned from the cots

1239
00:48:40,069 --> 00:48:37,359
program would you say that

1240
00:48:41,829 --> 00:48:40,079
it's more important to go slower if the

1241
00:48:46,470 --> 00:48:41,839
funding is not available but keep at

1242
00:48:49,190 --> 00:48:46,480
least two companies in the game or

1243
00:48:53,349 --> 00:48:49,200
or down select to one company in the

1244
00:48:57,589 --> 00:48:55,430
so getting the systems as soon as

1245
00:48:59,829 --> 00:48:57,599
possible and also having competition are

1246
00:49:02,150 --> 00:48:59,839
both goals that nasa uh would like to

1247
00:49:03,589 --> 00:49:02,160
maintain through this program i can't

1248
00:49:05,430 --> 00:49:03,599
say one is more important than the other

1249
00:49:07,190 --> 00:49:05,440
we're going to have to see

1250
00:49:08,870 --> 00:49:07,200
the proposals that come in for this next

1251
00:49:10,470 --> 00:49:08,880
round as charlie mentioned next week

1252
00:49:11,750 --> 00:49:10,480
we're going to be releasing our final

1253
00:49:14,230 --> 00:49:11,760
rfp

1254
00:49:16,549 --> 00:49:14,240
for the next round of proposals

1255
00:49:18,870 --> 00:49:16,559
or for the next round of commercial crew

1256
00:49:21,750 --> 00:49:18,880
activity which is expected to start next

1257
00:49:23,510 --> 00:49:21,760
summer so those proposals will really

1258
00:49:26,230 --> 00:49:23,520
dictate uh

1259
00:49:27,349 --> 00:49:26,240
how fast we go and how many we have

1260
00:49:28,790 --> 00:49:27,359
we're always going to have budget

1261
00:49:30,150 --> 00:49:28,800
challenges so

1262
00:49:32,069 --> 00:49:30,160
we kind of need to decide what kind of

1263
00:49:34,470 --> 00:49:32,079

program we want we want one that's going

1264
00:49:38,630 --> 00:49:36,390
be successful and deliver

1265
00:49:40,150 --> 00:49:38,640
a capability as soon as possible and we

1266
00:49:41,670 --> 00:49:40,160
believe the best way to do that is

1267
00:49:43,270 --> 00:49:41,680
through competition

1268
00:49:45,109 --> 00:49:43,280
so we would like to maintain that

1269
00:49:46,710 --> 00:49:45,119
obviously we're going to have some hard

1270
00:49:47,990 --> 00:49:46,720
decisions with the budget and we're just

1271
00:49:50,630 --> 00:49:48,000
going to have to see how that plays out

1272
00:49:52,309 --> 00:49:50,640
and see what the proposal say

1273
00:49:54,470 --> 00:49:52,319
see where the competition sort of plays

1274
00:49:58,150 --> 00:49:54,480
out and what's in the best interest for

1275
00:50:00,390 --> 00:49:58,160
nasa in that selection

1276
00:50:03,349 --> 00:50:00,400
um the next two uh went for franken one

1277
00:50:06,150 --> 00:50:03,359
for gwen um frank i know orbital's uh

1278
00:50:07,109 --> 00:50:06,160
pretty focused in with the first um

1279
00:50:09,349 --> 00:50:07,119
uh

1280
00:50:10,870 --> 00:50:09,359
supply mission but could you give us any

1281
00:50:12,630 --> 00:50:10,880
updates on

1282
00:50:15,750 --> 00:50:12,640
any um

1283
00:50:17,030 --> 00:50:15,760
non-nasa business or prospects that

1284
00:50:19,349 --> 00:50:17,040
might have come up since the

1285
00:50:20,710 --> 00:50:19,359
demonstration flight

1286
00:50:22,790 --> 00:50:20,720
i guess it was last month or the month

1287
00:50:24,710 --> 00:50:22,800
before i'm losing track of time

1288
00:50:26,230 --> 00:50:24,720

thanks

1289
00:50:28,790 --> 00:50:26,240
sorry irene i can't really talk about

1290
00:50:31,990 --> 00:50:28,800
competitive issues yet we're still in

1291
00:50:35,270 --> 00:50:32,000
negotiations and and uh discussions

1292
00:50:37,589 --> 00:50:35,280
but it is fascinating isn't it

1293
00:50:39,670 --> 00:50:37,599
okay um and gwen uh kind of a related

1294
00:50:40,470 --> 00:50:39,680
question for you is um

1295
00:50:43,270 --> 00:50:40,480
the

1296
00:50:45,349 --> 00:50:43,280
next launch of falcon 9 of course is uh

1297
00:50:49,270 --> 00:50:45,359
just coming up i guess another week or

1298
00:50:51,109 --> 00:50:49,280
so is that still on track for the 22nd i

1299
00:50:52,630 --> 00:50:51,119
had heard a report that it could be a

1300
00:50:53,510 --> 00:50:52,640
couple days later

1301
00:50:58,549 --> 00:50:53,520
and

1302
00:50:59,829 --> 00:50:58,559
the rocket will be going for the first

1303
00:51:02,630 --> 00:50:59,839
time to a

1304
00:51:04,630 --> 00:51:02,640
a new altitude and um

1305
00:51:07,030 --> 00:51:04,640
just a little bit about what you're

1306
00:51:09,109 --> 00:51:07,040
hoping to achieve with that ses flight

1307
00:51:12,150 --> 00:51:09,119
thanks

1308
00:51:15,430 --> 00:51:12,160
good afternoon irene um yes so uh the

1309
00:51:18,309 --> 00:51:15,440
next flight of the falcon 9 uh will uh

1310
00:51:21,349 --> 00:51:18,319
deliver the scs-8 satellite uh to a

1311
00:51:23,270 --> 00:51:21,359
geosynchronous transfer orbit um that

1312
00:51:25,109 --> 00:51:23,280
flight uh we did push it a couple of

1313
00:51:27,430 --> 00:51:25,119

days we're now well i don't i'm not sure

1314
00:51:29,910 --> 00:51:27,440
we have confirmation of range date um

1315
00:51:32,069 --> 00:51:29,920
but i know it was available the 25th

1316
00:51:33,910 --> 00:51:32,079
uh of this month so it's uh i think

1317
00:51:36,470 --> 00:51:33,920
that's a week from monday

1318
00:51:38,710 --> 00:51:36,480
we wanted a little bit more time to make

1319
00:51:40,230 --> 00:51:38,720
sure the launch site

1320
00:51:41,589 --> 00:51:40,240
was ready for us i wanted to give the

1321
00:51:43,190 --> 00:51:41,599
crew a little bit of rest they've been

1322
00:51:44,549 --> 00:51:43,200
working really really hard to get this

1323
00:51:45,349 --> 00:51:44,559
flight off

1324
00:51:48,150 --> 00:51:45,359
so

1325
00:51:53,109 --> 00:51:48,160
november 25th is the planned for date

1326
00:51:57,349 --> 00:51:55,829
any further questions

1327
00:51:59,750 --> 00:51:57,359
okay i think that's i think that's going

1328
00:52:01,990 --> 00:51:59,760
to be a wrap then let me just flag that

1329
00:52:03,430 --> 00:52:02,000
on nasa.gov you can find a press release

1330
00:52:05,030 --> 00:52:03,440
that drills down with a little bit more

1331
00:52:07,030 --> 00:52:05,040
information about the cots program and

1332
00:52:08,710 --> 00:52:07,040
what the success means and what comes

1333
00:52:11,270 --> 00:52:08,720
next uh also flagged the nasa

1334
00:52:13,109 --> 00:52:11,280
administrator has a blog out today

1335
00:52:14,630 --> 00:52:13,119
about the successful wrap-up of cots you

1336
00:52:16,309 --> 00:52:14,640
can find that on nasa.gov as well we'll

1337
00:52:18,630 --> 00:52:16,319
have the two videos that we showed

1338
00:52:20,309 --> 00:52:18,640

during the event up and a fact sheet on

1339
00:52:21,910 --> 00:52:20,319
a bit of nasa's commercial space

1340
00:52:24,150 --> 00:52:21,920
accomplishments to date there so go to

1341
00:52:25,990 --> 00:52:24,160
nasa.gov and just for more generally on

1342
00:52:27,510 --> 00:52:26,000
on nasa and commercial space flight

1343
00:52:29,670 --> 00:52:27,520
development you can go to nasdaq

1344
00:52:32,309 --> 00:52:29,680
commercial so let me um just

1345
00:52:34,630 --> 00:52:32,319
congratulate and thank all of our our

1346
00:52:35,910 --> 00:52:34,640
panelists for their time here today and