1
00:00:09,030 --> 00:00:07,190
it was a year ago this past april when

2
00:00:10,870 --> 00:00:09,040
kathy leaders officially was named

3
00:00:13,270 --> 00:00:10,880
manager of nasa's commercial crew

4
00:00:15,030 --> 00:00:13,280
program she spends a lot of time between

5
00:00:17,670 --> 00:00:15,040
the program office at the kennedy space

6
00:00:19,750 --> 00:00:17,680
center and here at johnson as well as

7
00:00:21,590 --> 00:00:19,760
conducts frequent trips to locations for

8
00:00:24,070 --> 00:00:21,600
those companies developing human rated

9
00:00:26,630 --> 00:00:24,080
spacecraft that will deliver crews to

10
00:00:28,550 --> 00:00:26,640
and from the international space station

11
00:00:30,790 --> 00:00:28,560
we're pleased to have her in houston and

12
00:00:33,270 --> 00:00:30,800
inside mission control to talk about the

13
00:00:35,430 --> 00:00:33,280

state of the commercial crew program a

14
00:00:38,069 --> 00:00:35,440
lot has happened in the past year

15
00:00:39,910 --> 00:00:38,079
and we'd like to welcome you back kathy

16
00:00:42,869 --> 00:00:39,920
thank you i appreciate it

17
00:00:45,190 --> 00:00:42,879
well from my vantage point um the last

18
00:00:47,910 --> 00:00:45,200
12 to 14 months has been

19
00:00:51,189 --> 00:00:47,920
kind of a blur relative to uh the

20
00:00:53,350 --> 00:00:51,199
commercial crew activity um how has how

21
00:00:54,630 --> 00:00:53,360
fast has your first year gone by has it

22
00:00:56,549 --> 00:00:54,640
been a year

23
00:00:57,590 --> 00:00:56,559
sometimes i feel like it's i'm in one of

24
00:00:59,910 --> 00:00:57,600
those uh

25
00:01:02,069 --> 00:00:59,920
matrix movies where the time phasing is

26
00:01:04,229 --> 00:01:02,079
kind of messed up you know and so

27
00:01:06,310 --> 00:01:04,239
um we're um i'm actually in houston

28
00:01:08,149 --> 00:01:06,320
right now for a quarterly and we've been

29
00:01:10,469 --> 00:01:08,159
kind of looking at all the things that

30
00:01:12,390 --> 00:01:10,479
have happened over this past year and

31
00:01:13,590 --> 00:01:12,400
it's just amazing

32
00:01:16,390 --> 00:01:13,600
well of course

33
00:01:18,789 --> 00:01:16,400
last fall boeing and spacex were named

34
00:01:20,630 --> 00:01:18,799
as the two companies that the program

35
00:01:22,310 --> 00:01:20,640
would put under contract to fly

36
00:01:23,590 --> 00:01:22,320
astronauts to and from the international

37
00:01:26,310 --> 00:01:23,600
space station

38
00:01:27,910 --> 00:01:26,320

um your team hit the ground running uh

39
00:01:28,870 --> 00:01:27,920
once those contracts were announced

40
00:01:31,350 --> 00:01:28,880
right

41
00:01:33,590 --> 00:01:31,360
yeah we had to really we were preparing

42
00:01:36,630 --> 00:01:33,600
all summer really to

43
00:01:38,149 --> 00:01:36,640
get through the award and um were

44
00:01:40,469 --> 00:01:38,159
pleasantly surprised

45
00:01:42,149 --> 00:01:40,479
the agency was able to make awards

46
00:01:43,190 --> 00:01:42,159
because competition was very important

47
00:01:45,429 --> 00:01:43,200
for us

48
00:01:48,310 --> 00:01:45,439
and with that investment we knew that we

49
00:01:51,590 --> 00:01:48,320
as a as the program had to be ready to

50
00:01:54,630 --> 00:01:51,600
execute and so the team had to gear up

51
00:01:57,270 --> 00:01:54,640
staff up and then be able to

52
00:01:58,950 --> 00:01:57,280
start moving out on our first milestones

53
00:02:00,709 --> 00:01:58,960
which were the certification baseline

54
00:02:02,630 --> 00:02:00,719
reviews

55
00:02:04,789 --> 00:02:02,640
then from there obviously the companies

56
00:02:06,789 --> 00:02:04,799
are off and running and

57
00:02:08,949 --> 00:02:06,799
so we've been frantically working with

58
00:02:11,589 --> 00:02:08,959
them on their key certification products

59
00:02:14,470 --> 00:02:11,599
while they're really doing the tough job

60
00:02:16,150 --> 00:02:14,480
of starting to get their hardware moving

61
00:02:18,630 --> 00:02:16,160
and so both

62
00:02:20,710 --> 00:02:18,640
boeing went ahead and started put money

63
00:02:22,790 --> 00:02:20,720

down on their first two

64
00:02:25,430 --> 00:02:22,800
launch vehicles to get ready for their

65
00:02:28,550 --> 00:02:25,440
uncrewed mission and their uh crude

66
00:02:30,630 --> 00:02:28,560
flight test very exciting to start

67
00:02:34,309 --> 00:02:30,640
numbers those are long lead items too

68
00:02:36,309 --> 00:02:34,319
obviously yeah long lead items um so

69
00:02:38,390 --> 00:02:36,319
united launch alliance is getting ready

70
00:02:40,229 --> 00:02:38,400
all already those vehicles are starting

71
00:02:41,990 --> 00:02:40,239
to

72
00:02:45,350 --> 00:02:42,000
be developed and processed in their

73
00:02:48,070 --> 00:02:45,360
decatur facility in addition spacex you

74
00:02:52,229 --> 00:02:48,080
know is has been working frantically on

75
00:02:54,790 --> 00:02:52,239
getting their design unsolidified and

76
00:02:57,430 --> 00:02:54,800
moving towards their cdr time frame

77
00:02:59,830 --> 00:02:57,440
which will be happening in the fall and

78
00:03:02,309 --> 00:02:59,840
then moving out on executing on their

79
00:03:04,710 --> 00:03:02,319
crude uncrewed mission and their crude

80
00:03:06,149 --> 00:03:04,720
flight test so very exciting times for

81
00:03:10,390 --> 00:03:06,159
us

82
00:03:13,350 --> 00:03:10,400
of those companies the commercial crew

83
00:03:14,869 --> 00:03:13,360
is under several different phases

84
00:03:17,589 --> 00:03:14,879
of course there are technical terms for

85
00:03:19,670 --> 00:03:17,599
that but they just completed a fairly

86
00:03:23,270 --> 00:03:19,680
big milestone

87
00:03:24,869 --> 00:03:23,280
the spectacular and fast pad abort test

88
00:03:26,949 --> 00:03:24,879

describe the importance of that

89
00:03:27,830 --> 00:03:26,959
milestone under the previous phase of

90
00:03:29,509 --> 00:03:27,840
the

91
00:03:31,509 --> 00:03:29,519
program

92
00:03:33,830 --> 00:03:31,519
as it relates to ensuring astronaut

93
00:03:34,550 --> 00:03:33,840
safety for flight

94
00:03:36,710 --> 00:03:34,560
so

95
00:03:39,110 --> 00:03:36,720
you know the paddleboard or really the

96
00:03:41,430 --> 00:03:39,120
abort feature for these crewed vehicles

97
00:03:42,949 --> 00:03:41,440
has been a feature that not only our

98
00:03:44,710 --> 00:03:42,959
commercial crew vehicles have but

99
00:03:45,830 --> 00:03:44,720
obviously orion has too it's an

100
00:03:47,910 --> 00:03:45,840
additional

101
00:03:50,550 --> 00:03:47,920
feature that that's been a requirement

102
00:03:52,869 --> 00:03:50,560
for crude test flight that had been

103
00:03:55,350 --> 00:03:52,879
there previously and under the previous

104
00:03:57,350 --> 00:03:55,360
programs but was used in a different way

105
00:04:01,910 --> 00:03:57,360
during the shuttle program and so

106
00:04:03,990 --> 00:04:01,920
um spacex during their sa milestones had

107
00:04:05,589 --> 00:04:04,000
in their unique way had decided that

108
00:04:08,470 --> 00:04:05,599
they wanted to

109
00:04:11,429 --> 00:04:08,480
use their saa milestones as a way to

110
00:04:13,990 --> 00:04:11,439
prove out that capability and so we were

111
00:04:16,069 --> 00:04:14,000
fortunate enough enough to have that

112
00:04:17,030 --> 00:04:16,079
they were able to go ahead and do that

113
00:04:17,990 --> 00:04:17,040

test

114
00:04:19,990 --> 00:04:18,000
and

115
00:04:22,629 --> 00:04:20,000
i mean when you look at it it was short

116
00:04:25,189 --> 00:04:22,639
test like you said from engine ignition

117
00:04:27,189 --> 00:04:25,199
to splash down two minutes but what it

118
00:04:29,670 --> 00:04:27,199
showed is that if you have a problem out

119
00:04:31,590 --> 00:04:29,680
on the pad the crew is able to safely

120
00:04:36,070 --> 00:04:31,600
get away from that problem in a very

121
00:04:40,469 --> 00:04:38,150
i don't want to say immature but not as

122
00:04:42,870 --> 00:04:40,479
mature design was able to to

123
00:04:47,189 --> 00:04:42,880
successfully deliver that capability to

124
00:04:49,430 --> 00:04:47,199
us so a real kudos for spacex um for at

125
00:04:51,430 --> 00:04:49,440
that development phase for that

126
00:04:53,749 --> 00:04:51,440
vehicle to be able to accomplish what's

127
00:04:55,189 --> 00:04:53,759
a very very very tough job

128
00:04:57,189 --> 00:04:55,199
well these two companies boeing and

129
00:04:59,189 --> 00:04:57,199
spacex obviously working on their

130
00:05:02,950 --> 00:04:59,199
separate

131
00:05:03,909 --> 00:05:02,960
spacecraft and integrated rocket designs

132
00:05:05,909 --> 00:05:03,919
but

133
00:05:07,909 --> 00:05:05,919
earlier this year we

134
00:05:10,710 --> 00:05:07,919
i guess it was this year yeah back in

135
00:05:12,550 --> 00:05:10,720
march february and march we conducted or

136
00:05:15,189 --> 00:05:12,560
this team conducted three spacewalks

137
00:05:16,629 --> 00:05:15,199
with the crew on orbit

138
00:05:18,469 --> 00:05:16,639

and they were directly related to

139
00:05:20,150 --> 00:05:18,479
commercial crew by

140
00:05:21,990 --> 00:05:20,160
setting the stage for the delivery of

141
00:05:24,710 --> 00:05:22,000
the first of two

142
00:05:26,710 --> 00:05:24,720
docking adapters talk about the how the

143
00:05:29,430 --> 00:05:26,720
ideas as they're called international

144
00:05:30,950 --> 00:05:29,440
docking adapters are now showing that

145
00:05:32,710 --> 00:05:30,960
we're not only

146
00:05:34,390 --> 00:05:32,720
the program working separately but it's

147
00:05:36,550 --> 00:05:34,400
actually now integrated with the space

148
00:05:38,469 --> 00:05:36,560
station real-time flight control team

149
00:05:40,790 --> 00:05:38,479
and the crew on orbit i think people

150
00:05:42,469 --> 00:05:40,800
forget that it's not just us getting the

151
00:05:44,870 --> 00:05:42,479
commercial crew vehicles ready it's

152
00:05:47,510 --> 00:05:44,880
really station had to make the first

153
00:05:51,110 --> 00:05:47,520
major modification to its overall

154
00:05:53,350 --> 00:05:51,120
architecture since really assembly right

155
00:05:56,150 --> 00:05:53,360
to be able to enable the commercial crew

156
00:05:57,430 --> 00:05:56,160
vehicles to come so tremendous effort to

157
00:05:59,670 --> 00:05:57,440
be able to

158
00:06:02,550 --> 00:05:59,680
integrate the com systems and the

159
00:06:04,710 --> 00:06:02,560
docking systems that are really required

160
00:06:06,230 --> 00:06:04,720
for these vehicles to be able to come up

161
00:06:07,830 --> 00:06:06,240
and dock with the international space

162
00:06:09,590 --> 00:06:07,840
station

163
00:06:11,749 --> 00:06:09,600

what my favorite part of the story is

164
00:06:13,830 --> 00:06:11,759
really that the two companies that are

165
00:06:16,070 --> 00:06:13,840
working on the commercial crew vehicles

166
00:06:18,790 --> 00:06:16,080
are the same companies that are making

167
00:06:20,790 --> 00:06:18,800
that happen so it's just so much fun for

168
00:06:23,510 --> 00:06:20,800
me to be able to see that boeing

169
00:06:25,110 --> 00:06:23,520
designed the docking adapters and spacex

170
00:06:27,430 --> 00:06:25,120
is going to be flying

171
00:06:29,510 --> 00:06:27,440
the hardware that boeing developed up to

172
00:06:31,830 --> 00:06:29,520
the international space station coming

173
00:06:34,950 --> 00:06:31,840
up in a couple weeks so actually next

174
00:06:36,309 --> 00:06:34,960
week so so very very exciting time

175
00:06:37,749 --> 00:06:36,319
and really

176
00:06:39,510 --> 00:06:37,759
shows the

177
00:06:41,990 --> 00:06:39,520
total collaborative effort that's

178
00:06:44,309 --> 00:06:42,000
required to make this happen

179
00:06:46,150 --> 00:06:44,319
and while all of that is going on

180
00:06:48,390 --> 00:06:46,160
obviously the

181
00:06:50,790 --> 00:06:48,400
program is continuing to work and

182
00:06:53,110 --> 00:06:50,800
support two other companies blue origin

183
00:06:56,390 --> 00:06:53,120
and sierra nevada

184
00:06:57,749 --> 00:06:56,400
through some space act agreements and

185
00:06:59,589 --> 00:06:57,759
what's new with the work that they're

186
00:07:01,510 --> 00:06:59,599
doing and what we're doing to work with

187
00:07:03,830 --> 00:07:01,520
those companies so one of my favorite

188
00:07:05,909 --> 00:07:03,840

parts of being in this program is is

189
00:07:08,150 --> 00:07:05,919
also being able to

190
00:07:09,990 --> 00:07:08,160
have the ability to work with a diverse

191
00:07:11,749 --> 00:07:10,000
set of companies and i think our team

192
00:07:13,589 --> 00:07:11,759
really learns from

193
00:07:16,230 --> 00:07:13,599
the progress that they're making out

194
00:07:19,189 --> 00:07:16,240
there on their own to develop their crew

195
00:07:21,350 --> 00:07:19,199
capabilities and so it's been

196
00:07:23,189 --> 00:07:21,360
very fun to see blue origin really

197
00:07:24,469 --> 00:07:23,199
emerging with the work that we've been

198
00:07:27,909 --> 00:07:24,479
doing with them on their engine

199
00:07:30,390 --> 00:07:27,919
development now emerging as a player and

200
00:07:33,350 --> 00:07:30,400
and this new vulcan you know

201
00:07:34,710 --> 00:07:33,360
launch vehicle strategy huge huge uh

202
00:07:38,550 --> 00:07:34,720
benefit

203
00:07:41,510 --> 00:07:38,560
the collaborations that we've been

204
00:07:45,110 --> 00:07:41,520
building on over the last few years and

205
00:07:45,990 --> 00:07:45,120
sierra they have been slogging away and

206
00:07:48,070 --> 00:07:46,000
and

207
00:07:50,469 --> 00:07:48,080
working so hard to get ready for their

208
00:07:52,869 --> 00:07:50,479
second drop test with us and so what's

209
00:07:55,270 --> 00:07:52,879
phenomenal is their vehicles really

210
00:07:57,270 --> 00:07:55,280
coming together now and and making

211
00:08:00,070 --> 00:07:57,280
tremendous progress and we are really

212
00:08:02,469 --> 00:08:00,080
looking forward to the work and effort

213
00:08:04,150 --> 00:08:02,479

um working towards their second drop

214
00:08:05,110 --> 00:08:04,160
test that's be coming up at the end of

215
00:08:06,629 --> 00:08:05,120
this year

216
00:08:09,510 --> 00:08:06,639
pretty exciting they

217
00:08:11,749 --> 00:08:09,520
that what may not be as exciting but as

218
00:08:12,710 --> 00:08:11,759
important probably you can describe this

219
00:08:15,029 --> 00:08:12,720
is

220
00:08:17,749 --> 00:08:15,039
here on the ground at the ken at kennedy

221
00:08:19,830 --> 00:08:17,759
and across the bay there at the cape

222
00:08:22,710 --> 00:08:19,840
canaveral air force station there's

223
00:08:26,150 --> 00:08:22,720
infrastructure work going on um

224
00:08:28,230 --> 00:08:26,160
that is as vital probably if not equal

225
00:08:30,629 --> 00:08:28,240
to the the other activity that's going

226
00:08:32,630 --> 00:08:30,639
on for the rocket development

227
00:08:35,029 --> 00:08:32,640
yeah you know the last time i came and

228
00:08:37,589 --> 00:08:35,039
talked to you we talked about how

229
00:08:40,389 --> 00:08:37,599
after shuttle after shuttle retirement

230
00:08:42,790 --> 00:08:40,399
how it was kind of sad to see those pads

231
00:08:44,710 --> 00:08:42,800
empty and what's amazing right now is

232
00:08:48,310 --> 00:08:44,720
that those pads aren't empty anymore you

233
00:08:50,949 --> 00:08:48,320
know you've got 39a

234
00:08:53,750 --> 00:08:50,959
spacex has just done a phenomenal job

235
00:08:55,910 --> 00:08:53,760
erecting a 300 foot a horizontal

236
00:08:58,710 --> 00:08:55,920
integration facility

237
00:09:01,350 --> 00:08:58,720
starting to build the major

238
00:09:04,790 --> 00:09:01,360

pieces and components of their

239
00:09:06,470 --> 00:09:04,800
new falcon heavy capability and their

240
00:09:08,710 --> 00:09:06,480
the new

241
00:09:11,350 --> 00:09:08,720
falcon capability that we'll be

242
00:09:14,389 --> 00:09:11,360
flying our vehicles to and so when you

243
00:09:16,790 --> 00:09:14,399
see that all coming back up again along

244
00:09:19,350 --> 00:09:16,800
with the orion work along with going

245
00:09:23,030 --> 00:09:19,360
over and looking at launch via launch

246
00:09:24,310 --> 00:09:23,040
complex 41 and seeing the crew

247
00:09:26,310 --> 00:09:24,320
access

248
00:09:28,230 --> 00:09:26,320
capabilities coming in and starting to

249
00:09:30,070 --> 00:09:28,240
see the tower being built

250
00:09:31,910 --> 00:09:30,080
in the middle of and honestly ula has

251
00:09:33,910 --> 00:09:31,920
done a phenomenal job figuring out how

252
00:09:35,829 --> 00:09:33,920
to do that in between their whole launch

253
00:09:38,110 --> 00:09:35,839
campaigns that they're doing you know

254
00:09:41,269 --> 00:09:38,120
you realize that in the

255
00:09:44,550 --> 00:09:41,279
2017-2018 time frame there's going to be

256
00:09:46,949 --> 00:09:44,560
three human spaceflight capabilities at

257
00:09:49,110 --> 00:09:46,959
the kennedy space center what a

258
00:09:50,870 --> 00:09:49,120
never before in history will that have

259
00:09:53,670 --> 00:09:50,880
happened and this is just going to be a

260
00:09:55,990 --> 00:09:53,680
phenomenal achievement for

261
00:09:57,750 --> 00:09:56,000
the aerospace industry in the united

262
00:09:59,829 --> 00:09:57,760
states as a whole

263
00:10:01,750 --> 00:09:59,839

well it's it's very exciting and uh

264
00:10:04,470 --> 00:10:01,760
kathy we really appreciate you taking

265
00:10:06,150 --> 00:10:04,480
some time out from your meetings to come

266
00:10:07,829 --> 00:10:06,160
over and talk to us and give us a

267
00:10:11,110 --> 00:10:07,839
progress report

268
00:10:13,269 --> 00:10:11,120
a year to 12 to 14 months after you came

269
00:10:15,430 --> 00:10:13,279
on board it's it that just shows how

270
00:10:17,430 --> 00:10:15,440
much work it has been done and we really

271
00:10:19,110 --> 00:10:17,440
appreciate you stopping by i appreciate

272
00:10:19,990 --> 00:10:19,120
you letting me come over and talk to you

273
00:10:21,910 --> 00:10:20,000
kyle