1
00:00:32,069 --> 00:00:26,380
[Music]

2
00:00:32,079 --> 00:00:40,200
t-minus one minute

3
00:01:02,110 --> 00:00:48,340
[Music]

4
00:01:02,120 --> 00:01:10,340
t-minus 30 seconds

5
00:01:10,350 --> 00:01:15,220
[Music]

6
00:01:29,610 --> 00:01:23,170
we are go for launch t-minus ten nine

7
00:01:34,560 --> 00:01:32,040
[Music]

8
00:01:36,810 --> 00:01:34,570
welcome back to the NASA social for the

9
00:02:09,999 --> 00:01:36,820
crew dragon mission as we prepare to

10
00:02:10,009 --> 00:02:18,250
[Music]

11
00:02:25,250 --> 00:02:21,740
and welcome back ladies and gentlemen

12
00:02:27,530 --> 00:02:25,260
once again NASA social virtual edition

13
00:02:29,809 --> 00:02:27,540

we are here live at the Kennedy Space

14
00:02:32,119 --> 00:02:29,819
Center visitors complex bringing you

15
00:02:34,039 --> 00:02:32,129
everything that we can to show you what

16
00:02:36,979 --> 00:02:34,049
happens in the background as we prepare

17
00:02:38,720 --> 00:02:36,989
to launch a rocket it's it's not rocket

18
00:02:40,729 --> 00:02:38,730
science but yes it is there's a lot

19
00:02:42,860 --> 00:02:40,739
going on a lot a lot of people involved

20
00:02:45,199 --> 00:02:42,870
and we're trying to bring to you as much

21
00:02:47,210 --> 00:02:45,209
as much as we can to help you understand

22
00:02:49,160 --> 00:02:47,220
what goes on behind the scenes all right

23
00:02:51,170 --> 00:02:49,170
once again i'm yves lamothe I am the

24
00:02:53,930 --> 00:02:51,180
comm project manager for exploration

25
00:02:56,750 --> 00:02:53,940
ground systems and with me today is my

26
00:02:58,970 --> 00:02:56,760
man Phil how's it going Phil it's going

27
00:03:00,410 --> 00:02:58,980
great thanks for the intro II absolutely

28
00:03:02,149 --> 00:03:00,420
as he said my name is Philip Hargrove

29
00:03:04,520 --> 00:03:02,159
with the launch services program I'm

30
00:03:06,770 --> 00:03:04,530
really excited to be here super exciting

31
00:03:08,960 --> 00:03:06,780
times at KSC right now

32
00:03:10,339 --> 00:03:08,970
so yeah we're here to talk about yeah

33
00:03:11,750 --> 00:03:10,349
everything leading up to the launch we

34
00:03:14,120 --> 00:03:11,760
have some special guests there should be

35
00:03:16,670 --> 00:03:14,130
some good discussion so for everybody

36
00:03:18,559 --> 00:03:16,680
watching online please submit your

37
00:03:20,390 --> 00:03:18,569
questions submit your comments so we

38
00:03:22,280 --> 00:03:20,400

really want you to be engaged since you

39
00:03:24,319 --> 00:03:22,290
know you can't be here with us in person

40
00:03:25,550 --> 00:03:24,329
like we would normally do we really want

41
00:03:27,949 --> 00:03:25,560
you to be a part of the discussion so

42
00:03:30,530 --> 00:03:27,959
please submit your questions online so

43
00:03:32,690 --> 00:03:30,540
we can ask our special guests absolutely

44
00:03:34,550 --> 00:03:32,700
this is all about educating you guys now

45
00:03:36,979 --> 00:03:34,560
if you look right behind us we have the

46
00:03:38,569 --> 00:03:36,989
beautiful Atlantis on the the shuttle

47
00:03:41,150 --> 00:03:38,579
has been a long time since it's flown

48
00:03:44,509 --> 00:03:41,160
but we get to sit here and enjoy it now

49
00:03:46,759 --> 00:03:44,519
what the theme here is right the old

50
00:03:49,189 --> 00:03:46,769
right that's that's the previous program

51
00:03:52,759 --> 00:03:49,199
and now we're launching into a new era

52
00:03:54,470 --> 00:03:52,769
where we have you know SpaceX with their

53
00:03:56,330 --> 00:03:54,480
rocket and they're launching astronauts

54
00:03:59,150 --> 00:03:56,340
on NASA's working on the same kind of a

55
00:04:01,460 --> 00:03:59,160
thing with the Space Launch System so

56
00:04:03,559 --> 00:04:01,470
we're looking forward to what NASA's

57
00:04:05,809 --> 00:04:03,569
future has to hold now with that guys I

58
00:04:07,789 --> 00:04:05,819
really want to get you guys to get to

59
00:04:09,740 --> 00:04:07,799
know our speakers and ask them as many

60
00:04:11,659 --> 00:04:09,750
questions as you can so with me the

61
00:04:13,039 --> 00:04:11,669
first guest today is Steve pain Steve

62
00:04:15,080 --> 00:04:13,049
how are you doing today I'm doing

63
00:04:17,479 --> 00:04:15,090

terrific I want to thank you so much for

64
00:04:19,399 --> 00:04:17,489
joining us and we're looking forward to

65
00:04:20,870 --> 00:04:19,409
a great conversation and being able to

66
00:04:23,570 --> 00:04:20,880
answer some of the questions that our

67
00:04:24,800 --> 00:04:23,580
viewers are gonna ask us so to get us

68
00:04:27,110 --> 00:04:24,810
into that why don't you tell us a little

69
00:04:29,630 --> 00:04:27,120
bit about yourself and what you do and

70
00:04:31,250 --> 00:04:29,640
we'll get the questions going okay I'm

71
00:04:33,290 --> 00:04:31,260
currently with human Lander systems

72
00:04:35,330 --> 00:04:33,300
working on the next moon lander project

73
00:04:36,589 --> 00:04:35,340
but for the last six years I've been

74
00:04:39,260 --> 00:04:36,599
working with a Commercial Crew program

75
00:04:41,360 --> 00:04:39,270
doing launch integration and launch

76
00:04:43,490 --> 00:04:41,370
integration is everything that needs to

77
00:04:45,290 --> 00:04:43,500
happen on the ground to make sure that

78
00:04:47,870 --> 00:04:45,300
the rocket can get off the pad and it

79
00:04:50,060 --> 00:04:47,880
involves everything from contingency

80
00:04:53,870 --> 00:04:50,070
planning to facilities launch teams

81
00:04:56,240 --> 00:04:53,880
communications astronaut preparations a

82
00:04:58,700 --> 00:04:56,250
lot of that and it's a big bucket of

83
00:05:00,379 --> 00:04:58,710
worms that one needs to worry about but

84
00:05:01,730 --> 00:05:00,389
it's a great fun job to do so because

85
00:05:02,450 --> 00:05:01,740
you have to be involved in so many

86
00:05:04,850 --> 00:05:02,460
different things

87
00:05:06,980 --> 00:05:04,860
now the Commercial Crew like they've

88
00:05:09,080 --> 00:05:06,990

been involved with locked rocket

89
00:05:11,420 --> 00:05:09,090
launches before the main difference here

90
00:05:14,149 --> 00:05:11,430
is we've got a couple astronauts onboard

91
00:05:16,279 --> 00:05:14,159
right and that is a very big difference

92
00:05:17,690 --> 00:05:16,289
both of our providers have experience

93
00:05:19,399 --> 00:05:17,700
with launch vehicles and space

94
00:05:22,219 --> 00:05:19,409
operations in the past they're you know

95
00:05:23,240 --> 00:05:22,229
they've been doing this for a while but

96
00:05:26,870 --> 00:05:23,250
it's very different when you have

97
00:05:30,230 --> 00:05:26,880
squishy things on the front end that get

98
00:05:32,029 --> 00:05:30,240
cold or get hot or get hungry or they

99
00:05:34,550 --> 00:05:32,039
need air they need comfort they need

100
00:05:36,649 --> 00:05:34,560
communications if something goes wrong

101
00:05:39,050 --> 00:05:36,659
you just can't walk away like you can

102
00:05:40,730 --> 00:05:39,060
with an inert rocket you have to take

103
00:05:42,709 --> 00:05:40,740
care of the people so there's quite a

104
00:05:44,690 --> 00:05:42,719
bit more that goes into it and you have

105
00:05:47,029 --> 00:05:44,700
to worry about them in the weeks going

106
00:05:49,490 --> 00:05:47,039
up to launch for example quarantine like

107
00:05:51,890 --> 00:05:49,500
we're doing right now on launch day

108
00:05:53,240 --> 00:05:51,900
there's a lot that goes on going uphill

109
00:05:55,190 --> 00:05:53,250
there's a lot that you have to worry

110
00:05:56,629 --> 00:05:55,200
about and once you're there and then

111
00:05:59,269 --> 00:05:56,639
recovering them and bringing them back

112
00:06:01,399 --> 00:05:59,279
home all those pieces are new and

113
00:06:03,529 --> 00:06:01,409

different to the human launch side of

114
00:06:05,240 --> 00:06:03,539
the house understand wow thank you for

115
00:06:06,830 --> 00:06:05,250
that for that introduction there

116
00:06:08,570 --> 00:06:06,840
uh Steven helping us understand how all

117
00:06:11,750 --> 00:06:08,580
of that works and the complexity that

118
00:06:13,700 --> 00:06:11,760
goes into getting humans ready for space

119
00:06:16,219 --> 00:06:13,710
launch it's it's nothing like cargo but

120
00:06:17,540 --> 00:06:16,229
I can only imagine awesome and so now

121
00:06:20,060 --> 00:06:17,550
why don't we go ahead and get right into

122
00:06:22,219 --> 00:06:20,070
the questions and and see what the

123
00:06:23,899 --> 00:06:22,229
audience is curious about of course so

124
00:06:25,700 --> 00:06:23,909
following your theme of thinking about

125
00:06:28,249 --> 00:06:25,710
the past and moving into the future can

126
00:06:31,189 --> 00:06:28,259
you tell us a little bit more about how

127
00:06:32,540 --> 00:06:31,199
your career at NASA started and I guess

128
00:06:34,190 --> 00:06:32,550
after that just giving us sort of a

129
00:06:35,180 --> 00:06:34,200
higher level overview of

130
00:06:37,130 --> 00:06:35,190
the other things that you've done at

131
00:06:38,510 --> 00:06:37,140
NASA maybe tell us what you're most

132
00:06:42,820 --> 00:06:38,520
looking forward to about this mission

133
00:06:46,610 --> 00:06:42,830
okay I can't hold the job apparently

134
00:06:48,590 --> 00:06:46,620
I've been here since 1990 working for a

135
00:06:51,350 --> 00:06:48,600
contractor on payloads and then working

136
00:06:55,070 --> 00:06:51,360
for NASA and payload operations working

137
00:06:58,880 --> 00:06:55,080
for the crew office in the vehicle test

138
00:07:01,730 --> 00:06:58,890

integration team working for daily

139
00:07:04,070 --> 00:07:01,740
operations for shuttle processing I got

140
00:07:05,900 --> 00:07:04,080
to do a stint working overseas in the

141
00:07:08,870 --> 00:07:05,910
transatlantic abort landing sites as a

142
00:07:11,020 --> 00:07:08,880
ground operations manager there came

143
00:07:13,910 --> 00:07:11,030
back did daily processing of shuttle

144
00:07:15,650 --> 00:07:13,920
became a tanking test director for

145
00:07:17,960 --> 00:07:15,660
shuttle launches and then an assistant

146
00:07:19,220 --> 00:07:17,970
test directory finally a shuttle test

147
00:07:22,220 --> 00:07:19,230
director or I got to lead the launch

148
00:07:23,870 --> 00:07:22,230
team after the end of shuttle I had a

149
00:07:26,600 --> 00:07:23,880
couple of year stint as chief of launch

150
00:07:28,280 --> 00:07:26,610
complex operations at Kennedy and then I

151
00:07:29,780 --> 00:07:28,290
got a call from Commercial Crew they

152
00:07:31,850 --> 00:07:29,790
needed somebody with launch experience

153
00:07:33,950 --> 00:07:31,860
who had done the human side and knew the

154
00:07:36,230 --> 00:07:33,960
ground operations part and it sounded

155
00:07:37,820 --> 00:07:36,240
too exciting to say no so that's where I

156
00:07:39,950 --> 00:07:37,830
went so I've been doing that for the

157
00:07:41,600 --> 00:07:39,960
last few years and only recently the

158
00:07:42,890 --> 00:07:41,610
last couple of weeks actually every

159
00:07:44,900 --> 00:07:42,900
tired from NASA and I came back to

160
00:07:47,720 --> 00:07:44,910
assist in a different capacity but

161
00:07:50,450 --> 00:07:47,730
working on another exciting project this

162
00:07:52,190 --> 00:07:50,460
particular mission is a culmination of

163
00:07:55,370 --> 00:07:52,200

all those years of hard work we put into

164
00:07:57,650 --> 00:07:55,380
this there are so many moving parts it's

165
00:07:59,090 --> 00:07:57,660
very hard to conceive from the outside

166
00:08:01,370 --> 00:07:59,100
most people just see the rocket they see

167
00:08:03,290 --> 00:08:01,380
it launchpad in the rocket and as far as

168
00:08:05,900 --> 00:08:03,300
they're concerned that's all that really

169
00:08:08,390 --> 00:08:05,910
happens but they don't realize the years

170
00:08:10,010 --> 00:08:08,400
of work that go into designing that

171
00:08:13,130 --> 00:08:10,020
rocket and making sure the rocket is

172
00:08:15,380 --> 00:08:13,140
safe and testing it and modifying it and

173
00:08:18,230 --> 00:08:15,390
assembling it and verifying everything

174
00:08:19,910 --> 00:08:18,240
is right and conducting all the

175
00:08:22,640 --> 00:08:19,920
different levels of testing that we do

176
00:08:25,700 --> 00:08:22,650
is such as the ground abort test or the

177
00:08:29,140 --> 00:08:25,710
in-flight abort test or capsule recovery

178
00:08:31,670 --> 00:08:29,150
testing docking to the space station

179
00:08:32,290 --> 00:08:31,680
doing simulations until we're blue in

180
00:08:34,430 --> 00:08:32,300
the face

181
00:08:36,350 --> 00:08:34,440
going through all the contingency

182
00:08:38,150 --> 00:08:36,360
scenarios and developing all the

183
00:08:42,050 --> 00:08:38,160
infrastructure to support it there is a

184
00:08:44,470 --> 00:08:42,060
lot of work involved so many of us have

185
00:08:46,580 --> 00:08:44,480
had a piece of that nobody can do it all

186
00:08:48,500 --> 00:08:46,590
but many of us has had a piece of that

187
00:08:50,720 --> 00:08:48,510
and this is where it's all finally

188
00:08:53,990 --> 00:08:50,730

coming together it's going to gel and

189
00:08:56,360 --> 00:08:54,000
we're terribly terribly excited about

190
00:08:58,670 --> 00:08:56,370
this launch so so let me let me ask you

191
00:09:02,000 --> 00:08:58,680
you mentioned contingency planning so

192
00:09:04,520 --> 00:09:02,010
let's say for example you know you just

193
00:09:07,810 --> 00:09:04,530
hit low Earth orbit and there's an issue

194
00:09:10,640 --> 00:09:07,820
with the docking mechanism at the

195
00:09:12,920 --> 00:09:10,650
International Space Station is there a

196
00:09:15,650 --> 00:09:12,930
protocol for that is are there steps to

197
00:09:18,560 --> 00:09:15,660
cover things things like that you knock

198
00:09:20,660 --> 00:09:18,570
and the door won't open you know how to

199
00:09:23,270 --> 00:09:20,670
what extent or detail is that

200
00:09:26,110 --> 00:09:23,280
contingency planning done one of the

201
00:09:29,090 --> 00:09:26,120
things that NASA is famous for is

202
00:09:30,680 --> 00:09:29,100
contingency planning backups and backups

203
00:09:32,810 --> 00:09:30,690
and backups and what happened redundancy

204
00:09:35,900 --> 00:09:32,820
if that doesn't work then what and if

205
00:09:37,940 --> 00:09:35,910
that doesn't work then so as an agency

206
00:09:40,310 --> 00:09:37,950
NASA is terrific at going into all the

207
00:09:42,110 --> 00:09:40,320
deep contingency scenarios so for

208
00:09:44,450 --> 00:09:42,120
everything we can imagine along the way

209
00:09:47,240 --> 00:09:44,460
somebody's come up with a hey this could

210
00:09:49,430 --> 00:09:47,250
possibly go wrong scenario and so a team

211
00:09:51,320 --> 00:09:49,440
of people goes out and solves that

212
00:09:52,700 --> 00:09:51,330
problem well if this doesn't work we're

213
00:09:55,910 --> 00:09:52,710

gonna do this and if that doesn't work

214
00:09:57,500 --> 00:09:55,920
then we'll do Plan B or Plan C until we

215
00:09:58,970 --> 00:09:57,510
come to the point where I guess we have

216
00:10:01,250 --> 00:09:58,980
to come home because we can't do the

217
00:10:04,370 --> 00:10:01,260
mission but everything along the way

218
00:10:08,210 --> 00:10:04,380
from emergencies starting at the pad to

219
00:10:10,880 --> 00:10:08,220
in-flight to docking problems too early

220
00:10:13,370 --> 00:10:10,890
undocking problems to re-entry problems

221
00:10:15,890 --> 00:10:13,380
all of those scenarios have been thought

222
00:10:18,710 --> 00:10:15,900
through and measures have been put in

223
00:10:20,510 --> 00:10:18,720
put in place to either prevent them from

224
00:10:21,950 --> 00:10:20,520
happening in the first place we try to

225
00:10:25,730 --> 00:10:21,960
correct it through engineering or

226
00:10:28,190 --> 00:10:25,740
procedures or if they do happen how to

227
00:10:30,350 --> 00:10:28,200
resolve them so there are lots of you

228
00:10:32,690 --> 00:10:30,360
know for example if we if we can't talk

229
00:10:33,830 --> 00:10:32,700
after several attempts and we change a

230
00:10:36,200 --> 00:10:33,840
bunch of things and try out a slightly

231
00:10:38,120 --> 00:10:36,210
different way each time if you can't if

232
00:10:40,460 --> 00:10:38,130
you can't doc then you will undock and

233
00:10:42,290 --> 00:10:40,470
come back and we'll try to get another

234
00:10:43,550 --> 00:10:42,300
time but all those procedures are built

235
00:10:46,940 --> 00:10:43,560
in so that we don't have to make them up

236
00:10:48,920 --> 00:10:46,950
on the fly and the team just whips out

237
00:10:50,750 --> 00:10:48,930
the appropriate procedure runs through

238
00:10:52,760 --> 00:10:50,760

it and it works pretty smoothly

239
00:10:54,320 --> 00:10:52,770
understood thank you for that for that

240
00:10:56,510 --> 00:10:54,330
explanation what else we have from the

241
00:10:58,090 --> 00:10:56,520
from our viewers right now sure

242
00:11:00,980 --> 00:10:58,100
I really like the way that you described

243
00:11:02,600 --> 00:11:00,990
sort of this effort because it made it

244
00:11:04,070 --> 00:11:02,610
really clear that there's a big team and

245
00:11:06,080 --> 00:11:04,080
there's so many people who need to have

246
00:11:07,910 --> 00:11:06,090
expertise well so many different things

247
00:11:09,860 --> 00:11:07,920
and you joked about you know not being

248
00:11:11,930 --> 00:11:09,870
able to keep a job to me that sounded

249
00:11:13,340 --> 00:11:11,940
like you know there was a lot of things

250
00:11:15,470 --> 00:11:13,350
that needed to be done and you were able

251
00:11:17,420 --> 00:11:15,480
to fill a lot of roles do you have

252
00:11:18,350 --> 00:11:17,430
advice for people who want to be

253
00:11:20,120 --> 00:11:18,360
involved in the space industry

254
00:11:21,830 --> 00:11:20,130
particularly human spaceflight

255
00:11:24,980 --> 00:11:21,840
absolutely I kind of ended up out here

256
00:11:26,300 --> 00:11:24,990
by accident I I originally started out

257
00:11:28,040 --> 00:11:26,310
in the Navy I studied engineering

258
00:11:30,020 --> 00:11:28,050
because I wanted to do something science

259
00:11:31,760 --> 00:11:30,030
and I liked aviation in space I figured

260
00:11:34,850 --> 00:11:31,770
if I studied engineering I could work in

261
00:11:37,100 --> 00:11:34,860
aviation in space at some point I flew

262
00:11:40,160 --> 00:11:37,110
for the Navy for a while when I got out

263
00:11:41,840 --> 00:11:40,170

I wanted to work space so I applied and

264
00:11:43,850 --> 00:11:41,850
because I had the engineering background

265
00:11:47,120 --> 00:11:43,860
and I had some aviation background which

266
00:11:49,340 --> 00:11:47,130
is a similar field it was easy for me to

267
00:11:50,960 --> 00:11:49,350
get in the door I started with a

268
00:11:52,150 --> 00:11:50,970
contractor because NASA wasn't hiring

269
00:11:54,470 --> 00:11:52,160
when I first got here

270
00:11:56,210 --> 00:11:54,480
then I transitioned when an opportunity

271
00:11:57,020 --> 00:11:56,220
became available and I've been doing

272
00:12:01,070 --> 00:11:57,030
that ever since

273
00:12:03,680 --> 00:12:01,080
and I've changed positions based on what

274
00:12:06,080 --> 00:12:03,690
the interesting thing is going on and

275
00:12:09,500 --> 00:12:06,090
there was no particular path to get to

276
00:12:11,990 --> 00:12:09,510
where I ended up we look for people who

277
00:12:13,670 --> 00:12:12,000
have varied experience so if you come in

278
00:12:14,990 --> 00:12:13,680
the door in whatever capacity you get in

279
00:12:17,750 --> 00:12:15,000
the door you know get your foot in the

280
00:12:19,550 --> 00:12:17,760
door that's the first thing once you're

281
00:12:20,870 --> 00:12:19,560
in the door before I lay that into

282
00:12:22,370 --> 00:12:20,880
something else get a little experience

283
00:12:24,230 --> 00:12:22,380
in one area and then find another

284
00:12:26,150 --> 00:12:24,240
related area where you can get some more

285
00:12:29,090 --> 00:12:26,160
experience and after a while you know

286
00:12:30,590 --> 00:12:29,100
things about engineering you know things

287
00:12:32,810 --> 00:12:30,600
about operations you know things about

288
00:12:35,060 --> 00:12:32,820

working with crew you know things about

289
00:12:36,950 --> 00:12:35,070
health stabilization you know things

290
00:12:39,110 --> 00:12:36,960
about international relations with other

291
00:12:41,900 --> 00:12:39,120
partners and after a while you know a

292
00:12:44,980 --> 00:12:41,910
lot of things and it makes you a viable

293
00:12:47,030 --> 00:12:44,990
candidate for many positions out there

294
00:12:48,590 --> 00:12:47,040
absolutely amazing I think we maybe have

295
00:12:51,620 --> 00:12:48,600
what time for one more question if time

296
00:12:53,780 --> 00:12:51,630
for Steve sure I'll try to come by in a

297
00:12:55,760 --> 00:12:53,790
couple of them so some people are asking

298
00:12:57,800 --> 00:12:55,770
about you know if you know contingency

299
00:12:58,610 --> 00:12:57,810
if things don't go well tomorrow I know

300
00:13:00,440 --> 00:12:58,620
you know the weather hasn't necessarily

301
00:13:02,660 --> 00:13:00,450
been great out here for the past few

302
00:13:05,420 --> 00:13:02,670
days what does the launch period look

303
00:13:07,460 --> 00:13:05,430
like for you know other attempts and in

304
00:13:09,710 --> 00:13:07,470
general what is the cadence supposed to

305
00:13:09,960 --> 00:13:09,720
be like for future launches after this

306
00:13:13,499 --> 00:13:09,970
one

307
00:13:16,529 --> 00:13:13,509
okay tomorrow we're supposed to launch

308
00:13:17,819 --> 00:13:16,539
at about 4:30 3:00 Eastern Time and the

309
00:13:19,499 --> 00:13:17,829
weather is probably our biggest

310
00:13:20,669 --> 00:13:19,509
constraint at the moment constraint

311
00:13:23,039 --> 00:13:20,679
being the things that keep you from

312
00:13:25,679 --> 00:13:23,049
launching just yesterday it was

313
00:13:27,119 --> 00:13:25,689

atrocious weather it poured all day long

314
00:13:28,319 --> 00:13:27,129
today it's getting a little better I

315
00:13:30,359 --> 00:13:28,329
understand tomorrow it's gonna be a

316
00:13:33,960 --> 00:13:30,369
little better we're looking I believe at

317
00:13:35,819 --> 00:13:33,970
a 60% go which is really pretty good

318
00:13:38,849 --> 00:13:35,829
odds we have launched with as little as

319
00:13:40,169 --> 00:13:38,859
10 or 20 in previous in the shuttle

320
00:13:42,539 --> 00:13:40,179
program we launched with less than that

321
00:13:44,579 --> 00:13:42,549
it all depends on whether you find a

322
00:13:47,159 --> 00:13:44,589
hole in the weather that happens to

323
00:13:49,079 --> 00:13:47,169
coincide with your launch window if your

324
00:13:51,059 --> 00:13:49,089
launch window is at 4:33 and you have a

325
00:13:52,919 --> 00:13:51,069
little bit of a gap between just before

326
00:13:56,069 --> 00:13:52,929
and just after where the sky clears up

327
00:13:57,569 --> 00:13:56,079
and everything lines up you can go even

328
00:14:01,259 --> 00:13:57,579
if it's raining to one side or the other

329
00:14:04,919 --> 00:14:01,269
you can go so 60% goes good odds and

330
00:14:07,289 --> 00:14:04,929
I'll take those any day it was the rest

331
00:14:08,669 --> 00:14:07,299
of your question late launch cadence so

332
00:14:09,539 --> 00:14:08,679
how many times are we gonna be launching

333
00:14:13,439 --> 00:14:09,549
you okay

334
00:14:15,689 --> 00:14:13,449
we're looking at keeping space station

335
00:14:18,359 --> 00:14:15,699
crew missions are about 180 days apart

336
00:14:21,059 --> 00:14:18,369
so in theory we'll have a mission going

337
00:14:25,049 --> 00:14:21,069
out there approximately every 180 days

338
00:14:26,909 --> 00:14:25,059

with crew to rotate crews out if we get

339
00:14:29,399 --> 00:14:26,919
to a point where we have enough vehicles

340
00:14:31,109 --> 00:14:29,409
and enough capability we maybe choose to

341
00:14:34,799 --> 00:14:31,119
put more people up there and it will

342
00:14:37,019 --> 00:14:34,809
require more missions obviously if the

343
00:14:40,049 --> 00:14:37,029
providers once they're certified choose

344
00:14:42,210 --> 00:14:40,059
to take passengers up to do science on

345
00:14:45,119 --> 00:14:42,220
space station for example then they

346
00:14:47,429 --> 00:14:45,129
might go more often so that it's at

347
00:14:50,999 --> 00:14:47,439
least every six months but perhaps even

348
00:14:52,949 --> 00:14:51,009
more often our next mission after this

349
00:14:56,399 --> 00:14:52,959
one is going to be the crew one post

350
00:14:58,409 --> 00:14:56,409
post certification mission which means

351
00:14:59,639 --> 00:14:58,419
that after this demonstration mission if

352
00:15:01,139 --> 00:14:59,649
everything goes well and once we've

353
00:15:02,939 --> 00:15:01,149
resolved anything we find because you

354
00:15:05,699 --> 00:15:02,949
always find something once that's all

355
00:15:10,109 --> 00:15:05,709
resolved and we launched that first crew

356
00:15:12,449 --> 00:15:10,119
mission they are an FAA regulated

357
00:15:16,049 --> 00:15:12,459
commercial entity that can launch people

358
00:15:18,329 --> 00:15:16,059
into space so the cadence depends on how

359
00:15:20,460 --> 00:15:18,339
often they choose to launch and how

360
00:15:22,990 --> 00:15:20,470
often we need them we may need to swap

361
00:15:25,270 --> 00:15:23,000
them out sooner it depends

362
00:15:26,920 --> 00:15:25,280
once we get our both of our commercial

363
00:15:28,680 --> 00:15:26,930

partners online and we start going back

364
00:15:29,830 --> 00:15:28,690
and forth it'll work out nicely I think

365
00:15:31,090 --> 00:15:29,840
gotcha

366
00:15:34,120 --> 00:15:31,100
and Steven what would you say is the

367
00:15:36,430 --> 00:15:34,130
most exciting part you know as we get

368
00:15:38,790 --> 00:15:36,440
ready to for the launch tomorrow is the

369
00:15:43,420 --> 00:15:38,800
best it's going to be the best day it's

370
00:15:45,100 --> 00:15:43,430
from the time the crew wakes up and gets

371
00:15:47,440 --> 00:15:45,110
their breakfast and does their press

372
00:15:50,140 --> 00:15:47,450
conference and all that they go suit up

373
00:15:51,910 --> 00:15:50,150
they put on their suits obviously the

374
00:15:53,350 --> 00:15:51,920
the the tension Rises because

375
00:15:55,140 --> 00:15:53,360
everybody's starting to get excited

376
00:16:00,100 --> 00:15:55,150
we're waiting for everything to happen

377
00:16:02,980 --> 00:16:00,110
and really it hits us when we're about

378
00:16:06,780 --> 00:16:02,990
to walk out of crew quarters when the

379
00:16:10,180 --> 00:16:06,790
team is ready and they walk out of the

380
00:16:11,620 --> 00:16:10,190
historic door at crew quarters and wave

381
00:16:13,300 --> 00:16:11,630
at the crowds and get into their

382
00:16:16,600 --> 00:16:13,310
transport vehicles to be taken to the

383
00:16:18,730 --> 00:16:16,610
pad that's really gonna signal the dawn

384
00:16:21,520 --> 00:16:18,740
of a new era and space travel you know

385
00:16:23,920 --> 00:16:21,530
speaking of those doors folks why don't

386
00:16:25,750 --> 00:16:23,930
we take a quick look at how it really

387
00:16:36,610 --> 00:16:25,760
happens and what it feels like walking

388
00:16:41,540 --> 00:16:39,410

that's Neil Armstrong Buzz Aldrin and

389
00:16:42,889 --> 00:16:41,550
then Ronnie Mike Collins now boarding

390
00:16:45,590 --> 00:16:42,899
the transfer van

391
00:16:49,710 --> 00:16:45,600
brother trip to the lunch Lasha here our

392
00:16:55,760 --> 00:16:52,410
very historical walkway it's the same

393
00:17:08,790 --> 00:16:58,510
now the planning from their two quarters

394
00:17:13,940 --> 00:17:10,300
[Music]

395
00:17:16,340 --> 00:17:13,950
now if that's not exciting I don't know

396
00:17:18,410 --> 00:17:16,350
what is all right so hopefully you guys

397
00:17:19,699 --> 00:17:18,420
got a good feel for what it feels like

398
00:17:21,620 --> 00:17:19,709
when those astronauts walked through the

399
00:17:24,140 --> 00:17:21,630
door and they're about to get strapped

400
00:17:24,500 --> 00:17:24,150
into that capsule and take off the

401
00:17:26,420 --> 00:17:24,510
launch

402
00:17:28,760 --> 00:17:26,430
all right so Steve thank you so much for

403
00:17:30,590 --> 00:17:28,770
everything that you provided us and now

404
00:17:33,620 --> 00:17:30,600
we have a second special guest with us

405
00:17:35,270 --> 00:17:33,630
we have the deputy program manager of

406
00:17:40,100 --> 00:17:35,280
the Commercial Crew program Dana

407
00:17:42,410 --> 00:17:40,110
Hutchinson how you doing today Dana we

408
00:17:44,240 --> 00:17:42,420
are so honored to have you and then of

409
00:17:45,620 --> 00:17:44,250
course the same thing guys on what we're

410
00:17:47,210 --> 00:17:45,630
gonna do is we're gonna get to know a

411
00:17:49,580 --> 00:17:47,220
little bit about Dana and it wouldn't

412
00:17:51,620 --> 00:17:49,590
we're gonna field your questions to ask

413
00:17:53,390 --> 00:17:51,630

her so you guys can get educated about

414
00:17:54,500 --> 00:17:53,400
what we have going on here so Dennis can

415
00:17:56,180 --> 00:17:54,510
you please tell us a little bit about

416
00:17:58,670 --> 00:17:56,190
yourself okay thanks

417
00:18:00,050 --> 00:17:58,680
I appreciate you having me here so my

418
00:18:02,420 --> 00:18:00,060
name is Dana Hutcherson deputy program

419
00:18:03,740 --> 00:18:02,430
manager what I've been doing for the

420
00:18:04,970 --> 00:18:03,750
last ten years is working with

421
00:18:07,280 --> 00:18:04,980
Commercial Crew programs I've been

422
00:18:09,920 --> 00:18:07,290
working with this fabulous team of

423
00:18:12,590 --> 00:18:09,930
engineers of technicians everyone even

424
00:18:15,710 --> 00:18:12,600
our commercial partner SpaceX to make

425
00:18:18,410 --> 00:18:15,720
sure that we can get these astronauts to

426
00:18:19,730 --> 00:18:18,420
launch from American soil on American

427
00:18:23,090 --> 00:18:19,740
Rockets back up to the International

428
00:18:25,130 --> 00:18:23,100
Space Station so what I do in a daily

429
00:18:27,740 --> 00:18:25,140
life is work with our program manager

430
00:18:29,540 --> 00:18:27,750
with Cathy leaders another deputy Steve

431
00:18:30,860 --> 00:18:29,550
stich and we kind of work together to

432
00:18:32,690 --> 00:18:30,870
make sure that we're covering the

433
00:18:35,030 --> 00:18:32,700
waterfront on managing the program

434
00:18:37,310 --> 00:18:35,040
activities on a daily basis more

435
00:18:41,300 --> 00:18:37,320
recently we've been dealing with the

436
00:18:42,950 --> 00:18:41,310
Kovan scenario so essential work and

437
00:18:44,150 --> 00:18:42,960
kind of focusing on making sure that

438
00:18:47,120 --> 00:18:44,160

we're doing the right things and

439
00:18:50,480 --> 00:18:47,130
protecting our people as well Wow now

440
00:18:52,970 --> 00:18:50,490
that that has to weigh heavy having to

441
00:18:55,310 --> 00:18:52,980
manage you know getting everything ready

442
00:18:58,100 --> 00:18:55,320
and dealing with the kovat situation at

443
00:19:00,260 --> 00:18:58,110
the same time but somehow someway we're

444
00:19:02,420 --> 00:19:00,270
NASA and we will prevail right and

445
00:19:05,480 --> 00:19:02,430
that's that's what's important so I'm

446
00:19:07,250 --> 00:19:05,490
fantastic so it's great intro so now

447
00:19:09,260 --> 00:19:07,260
what we want to do is make sure everyone

448
00:19:10,460 --> 00:19:09,270
has an opportunity as to ask questions

449
00:19:12,260 --> 00:19:10,470
so we're gonna go right into the

450
00:19:13,850 --> 00:19:12,270
questions from our viewers and let's see

451
00:19:15,080 --> 00:19:13,860
what they what they want to know of

452
00:19:17,540 --> 00:19:15,090
course you already have some great

453
00:19:19,130 --> 00:19:17,550
questions so can you give us a little

454
00:19:21,230 --> 00:19:19,140
bit of background about the Commercial

455
00:19:22,370 --> 00:19:21,240
Crew program and how we got started and

456
00:19:23,660 --> 00:19:22,380
maybe

457
00:19:24,890 --> 00:19:23,670
how it related to the end of the shuttle

458
00:19:26,600 --> 00:19:24,900
program because he said you didn't

459
00:19:29,120 --> 00:19:26,610
you're working for about ten years so

460
00:19:30,560 --> 00:19:29,130
that kind of overlaps with you know the

461
00:19:32,810 --> 00:19:30,570
nine years since the last shuttle flight

462
00:19:34,910 --> 00:19:32,820
so maybe give people some perspective on

463
00:19:38,270 --> 00:19:34,920

and how things molded from the shuttle

464
00:19:40,430 --> 00:19:38,280
program into Commercial Crew right so as

465
00:19:42,170 --> 00:19:40,440
I said I worked I've been working with

466
00:19:44,060 --> 00:19:42,180
course worker program for almost ten

467
00:19:45,980 --> 00:19:44,070
years about nine years ish since we

468
00:19:49,220 --> 00:19:45,990
first started the program so I actually

469
00:19:51,530 --> 00:19:49,230
worked on endeavour before for the last

470
00:19:53,150 --> 00:19:51,540
Endeavour flight and then once we landed

471
00:19:54,980 --> 00:19:53,160
I was fully committed to working on

472
00:19:56,810 --> 00:19:54,990
Commercial Crew program so at the time

473
00:19:59,210 --> 00:19:56,820
we started off with the Space Act

474
00:20:01,340 --> 00:19:59,220
agreements with multiple partners and we

475
00:20:03,830 --> 00:20:01,350
started working with these with these

476
00:20:06,230 --> 00:20:03,840
designs of these that these providers

477
00:20:07,880 --> 00:20:06,240
had and trying to work with them about

478
00:20:10,030 --> 00:20:07,890
historically what we've learned through

479
00:20:13,340 --> 00:20:10,040
human spaceflight and helping them to

480
00:20:15,170 --> 00:20:13,350
hone in on their designs and through the

481
00:20:17,690 --> 00:20:15,180
years working with these various

482
00:20:20,090 --> 00:20:17,700
providers we've actually got to the

483
00:20:23,210 --> 00:20:20,100
contract phase of it we're about five

484
00:20:25,520 --> 00:20:23,220
five years ago and now we're here and

485
00:20:28,220 --> 00:20:25,530
this test and these test flights were

486
00:20:30,950 --> 00:20:28,230
still in the test flight stage of our

487
00:20:32,780 --> 00:20:30,960
program but we're at the the phase now

488
00:20:34,940 --> 00:20:32,790

where we're launching humans which is

489
00:20:35,930 --> 00:20:34,950
the most exciting part right we want to

490
00:20:38,150 --> 00:20:35,940
make sure that weird we've done

491
00:20:39,560 --> 00:20:38,160
everything correctly so a lot for the

492
00:20:42,590 --> 00:20:39,570
last so many years of making sure that

493
00:20:44,300 --> 00:20:42,600
we are checking all of the boxes

494
00:20:46,340 --> 00:20:44,310
correctly looking over everything and

495
00:20:48,380 --> 00:20:46,350
making sure that we're good to go as a

496
00:20:49,910 --> 00:20:48,390
whole community and we've been sitting

497
00:20:52,790 --> 00:20:49,920
through reviews in the last several

498
00:20:54,350 --> 00:20:52,800
weeks kovat spacing as well you know

499
00:20:56,060 --> 00:20:54,360
we've been sitting six feet apart but

500
00:20:58,850 --> 00:20:56,070
we've been sitting in these reviews with

501
00:21:01,370 --> 00:20:58,860
teams of people both on the SpaceX side

502
00:21:04,010 --> 00:21:01,380
and NASA and working through all of the

503
00:21:05,750 --> 00:21:04,020
have we've done the right thing as far

504
00:21:07,610 --> 00:21:05,760
as reviewing all of the data have we

505
00:21:10,670 --> 00:21:07,620
missed anything so we've been really

506
00:21:12,260 --> 00:21:10,680
making sure that we are looking at

507
00:21:13,880 --> 00:21:12,270
everything and that the whole team is

508
00:21:16,250 --> 00:21:13,890
comfortable we've had this you know we

509
00:21:18,860 --> 00:21:16,260
do have our program is spread across the

510
00:21:21,020 --> 00:21:18,870
whole nation so we do have various

511
00:21:23,600 --> 00:21:21,030
centers working together we've learned

512
00:21:26,180 --> 00:21:23,610
too while we always work virtually as a

513
00:21:28,730 --> 00:21:26,190

program anyway we've learned to deal

514
00:21:30,950 --> 00:21:28,740
with the extra virtual aspect of the

515
00:21:32,550 --> 00:21:30,960
episode so do the astronauts have to be

516
00:21:38,140 --> 00:21:32,560
six feet apart inside the capsule

517
00:21:44,120 --> 00:21:41,180
very very very good now you know from

518
00:21:46,160 --> 00:21:44,130
your level being that you're the deputy

519
00:21:50,000 --> 00:21:46,170
program manager this is going to be the

520
00:21:52,340 --> 00:21:50,010
first flight where is this headed do do

521
00:21:55,030 --> 00:21:52,350
we see is is this like when airports

522
00:21:57,590 --> 00:21:55,040
first began where you had you had a

523
00:21:58,970 --> 00:21:57,600
plane that flew off and it worked and

524
00:22:00,830 --> 00:21:58,980
then so next thing you know they're

525
00:22:03,230 --> 00:22:00,840
building a bunch of planes and then now

526
00:22:06,550 --> 00:22:03,240
we have an airport where do you see this

527
00:22:09,050 --> 00:22:06,560
going you know I think that's what we

528
00:22:11,870 --> 00:22:09,060
when we used to have the shuttle program

529
00:22:13,520 --> 00:22:11,880
and it was a big NASA entity and now

530
00:22:15,140 --> 00:22:13,530
we're working with these private

531
00:22:17,000 --> 00:22:15,150
companies and work in this commercial

532
00:22:19,040 --> 00:22:17,010
aspect that we hope that this opens the

533
00:22:21,950 --> 00:22:19,050
door to being able to have more

534
00:22:23,540 --> 00:22:21,960
commercial space and it's it's already

535
00:22:26,030 --> 00:22:23,550
you know looking at opening the door for

536
00:22:28,730 --> 00:22:26,040
other types of commercial space travel

537
00:22:31,280 --> 00:22:28,740
too so that was our hope in this program

538
00:22:32,990 --> 00:22:31,290

is to pull a team together of experts

539
00:22:35,210 --> 00:22:33,000
that have worked with human space flight

540
00:22:36,920 --> 00:22:35,220
that have worked with the design of some

541
00:22:38,960 --> 00:22:36,930
of these rockets that are already flying

542
00:22:41,090 --> 00:22:38,970
commercially and flying payloads

543
00:22:42,920 --> 00:22:41,100
commercially so we're trying to work

544
00:22:44,900 --> 00:22:42,930
with all these experts to try to make

545
00:22:46,940 --> 00:22:44,910
sure that you know let's open the door

546
00:22:49,130 --> 00:22:46,950
so that other private companies other

547
00:22:50,690 --> 00:22:49,140
commercial aspects can go out and do

548
00:22:53,480 --> 00:22:50,700
this as well we hope that that's the

549
00:22:55,610 --> 00:22:53,490
vision is that to see one day everybody

550
00:23:00,620 --> 00:22:55,620
you could go up into space and foil no

551
00:23:02,510 --> 00:23:00,630
I'm okay I would totally take a trip up

552
00:23:04,160 --> 00:23:02,520
to up to space I don't know that I would

553
00:23:06,140 --> 00:23:04,170
want to stay up there for six months but

554
00:23:09,170 --> 00:23:06,150
maybe a couple times around the earth

555
00:23:11,240 --> 00:23:09,180
and and it just bring me back home what

556
00:23:13,280 --> 00:23:11,250
else we have from our viewers there that

557
00:23:15,320 --> 00:23:13,290
was a great question about you know sort

558
00:23:16,640 --> 00:23:15,330
of the airport analogy especially since

559
00:23:18,260 --> 00:23:16,650
Kennedy Space Center you know we're the

560
00:23:20,030 --> 00:23:18,270
multi-user spaceport cuz we're already

561
00:23:21,920 --> 00:23:20,040
seeing that happen in terms of

562
00:23:23,360 --> 00:23:21,930
spacecraft from a lot of different

563
00:23:25,700 --> 00:23:23,370

places and you know a lot of different

564
00:23:27,710 --> 00:23:25,710
launch vehicle companies you know

565
00:23:29,360 --> 00:23:27,720
growing up and then using some of these

566
00:23:31,760 --> 00:23:29,370
pads that have been historically you

567
00:23:33,410 --> 00:23:31,770
know NASA and government only so it's

568
00:23:35,750 --> 00:23:33,420
awesome to see that translating into a

569
00:23:39,080 --> 00:23:35,760
human spaceflight as well so so I

570
00:23:41,780 --> 00:23:39,090
appreciate that perspective so more dm2

571
00:23:43,310 --> 00:23:41,790
specific it seems like there was a lot

572
00:23:44,130 --> 00:23:43,320
of intentionality you know over the last

573
00:23:45,810 --> 00:23:44,140
ten years

574
00:23:47,880 --> 00:23:45,820
you know the decisions that NASA was

575
00:23:49,890 --> 00:23:47,890
making working with these companies are

576
00:23:51,990 --> 00:23:49,900
you familiar with why these two

577
00:23:53,700 --> 00:23:52,000
astronauts were chosen for this mission

578
00:23:54,900 --> 00:23:53,710
and you know have they flown on previous

579
00:23:56,760 --> 00:23:54,910
missions or is this gonna be their first

580
00:23:59,310 --> 00:23:56,770
time flying in space you know I'm not

581
00:24:01,590 --> 00:23:59,320
I'm familiar with the whole the details

582
00:24:04,440 --> 00:24:01,600
of how they actually specifically chose

583
00:24:06,720 --> 00:24:04,450
these two but they both have flown they

584
00:24:09,540 --> 00:24:06,730
have flown on the shuttle flights as

585
00:24:11,310 --> 00:24:09,550
well so actually I think is it Doug

586
00:24:14,370 --> 00:24:11,320
Hurley that flew on the last shuttle

587
00:24:17,150 --> 00:24:14,380
mission so you know they've had the

588
00:24:19,500 --> 00:24:17,160

experience of human space flight so they

589
00:24:22,020 --> 00:24:19,510
understand the aspects they're not new

590
00:24:25,140 --> 00:24:22,030
to human space flights and I think they

591
00:24:27,300 --> 00:24:25,150
and once again also they are a part of

592
00:24:29,790 --> 00:24:27,310
our team they have been a part of our

593
00:24:32,250 --> 00:24:29,800
team for years where they follow along

594
00:24:34,200 --> 00:24:32,260
all of the development all the design

595
00:24:36,810 --> 00:24:34,210
reviews that we go through as a program

596
00:24:40,530 --> 00:24:36,820
with these with these vehicles so they

597
00:24:42,780 --> 00:24:40,540
are watching it along they are being

598
00:24:45,750 --> 00:24:42,790
able to go into the vehicle go out to

599
00:24:47,100 --> 00:24:45,760
the actually in SpaceX Hathor and

600
00:24:49,470 --> 00:24:47,110
they're actually going out there and

601
00:24:52,770 --> 00:24:49,480
talking with the designers and working

602
00:24:54,480 --> 00:24:52,780
with them to help them you know to hone

603
00:24:56,640 --> 00:24:54,490
in on their design so that they can have

604
00:24:59,370 --> 00:24:56,650
it fit for the astronaut so they've been

605
00:25:02,160 --> 00:24:59,380
able to use their expertise and and help

606
00:25:03,630 --> 00:25:02,170
these aged these designs so you've put

607
00:25:06,060 --> 00:25:03,640
you know you and your team have put a

608
00:25:08,430 --> 00:25:06,070
lot of work into it all of it and it's

609
00:25:10,110 --> 00:25:08,440
all coming together tomorrow afternoon

610
00:25:12,360 --> 00:25:10,120
as we get ready to launch these

611
00:25:14,430 --> 00:25:12,370
astronauts not these astronauts up into

612
00:25:17,640 --> 00:25:14,440
space is there anything making you

613
00:25:19,740 --> 00:25:17,650

nervous you know I think all of us have

614
00:25:23,580 --> 00:25:19,750
a little bit of that anxiety you know

615
00:25:24,810 --> 00:25:23,590
and until I think for me for a number of

616
00:25:27,750 --> 00:25:24,820
us we're gonna have a little bit of

617
00:25:30,000 --> 00:25:27,760
anxiety until we get Bob and Doug safely

618
00:25:31,650 --> 00:25:30,010
on the ground again I think you know for

619
00:25:33,060 --> 00:25:31,660
it's it's gonna be a little bit of a

620
00:25:36,180 --> 00:25:33,070
longer mission so we're gonna make sure

621
00:25:37,950 --> 00:25:36,190
that we're focused on what's happening

622
00:25:40,770 --> 00:25:37,960
and focusing on all of the details

623
00:25:43,980 --> 00:25:40,780
throughout the whole mission so you know

624
00:25:46,080 --> 00:25:43,990
we're all a little bit anxious excited

625
00:25:48,000 --> 00:25:46,090
too I mean you know just talking with my

626
00:25:50,640 --> 00:25:48,010
neighbors and my friends and my family

627
00:25:52,350 --> 00:25:50,650
and and they're kind of they're like oh

628
00:25:52,659 --> 00:25:52,360
we're gonna get to see this again you

629
00:25:56,109 --> 00:25:52,669
know

630
00:25:59,259 --> 00:25:56,119
the astronauts launching back from the

631
00:26:00,580 --> 00:25:59,269
US and in our local area so I think you

632
00:26:02,080 --> 00:26:00,590
know it's just exciting to be able to

633
00:26:04,840 --> 00:26:02,090
share that some of those moments and

634
00:26:07,869 --> 00:26:04,850
with the community and with with our

635
00:26:09,099 --> 00:26:07,879
folks so you talked about you know

636
00:26:10,930 --> 00:26:09,109
getting them into space and then also

637
00:26:13,210 --> 00:26:10,940
bringing them back okay and you also

638
00:26:14,859 --> 00:26:13,220

mentioned earlier about how you know the

639
00:26:16,810 --> 00:26:14,869
Commercial Crew program is you know

640
00:26:19,119 --> 00:26:16,820
spread across different states you have

641
00:26:20,139 --> 00:26:19,129
people at Johnson and Houston and I'm

642
00:26:22,359 --> 00:26:20,149
sure in other places

643
00:26:24,669 --> 00:26:22,369
can you talk about how that sort of

644
00:26:27,070 --> 00:26:24,679
functions how you all are involved from

645
00:26:29,440 --> 00:26:27,080
launch through return and how it's not

646
00:26:32,529 --> 00:26:29,450
just it's not just the launch tomorrow

647
00:26:33,759 --> 00:26:32,539
that you're involved in right so you

648
00:26:35,799 --> 00:26:33,769
know we're following at Mission Control

649
00:26:38,529 --> 00:26:35,809
out in Houston during the whole mission

650
00:26:40,810 --> 00:26:38,539
as well you know side by side with

651
00:26:44,619 --> 00:26:40,820
SpaceX is there watch watching the

652
00:26:45,700 --> 00:26:44,629
vehicle so we're just as any vehicle is

653
00:26:47,379 --> 00:26:45,710
docked to the International Space

654
00:26:49,330 --> 00:26:47,389
Station we're gonna be following along

655
00:26:51,279 --> 00:26:49,340
any of the things that go they're gonna

656
00:26:53,379 --> 00:26:51,289
go in and regularly check the vehicle

657
00:26:55,269 --> 00:26:53,389
make sure that things are you know

658
00:26:57,489 --> 00:26:55,279
functioning they're going to we're gonna

659
00:26:59,409 --> 00:26:57,499
be looking at weather patterns you know

660
00:27:00,310 --> 00:26:59,419
for landing we're gonna be there's a lot

661
00:27:02,739 --> 00:27:00,320
of things that we're going to be doing

662
00:27:04,840 --> 00:27:02,749
not only to prepare for the next

663
00:27:07,629 --> 00:27:04,850

missions that are coming up but also

664
00:27:09,430 --> 00:27:07,639
following along the mission itself so

665
00:27:12,729 --> 00:27:09,440
and you mentioned you know we do have

666
00:27:14,289 --> 00:27:12,739
folks out it at Marshall specifically to

667
00:27:17,200 --> 00:27:14,299
looking they'll be looking at the post

668
00:27:19,180 --> 00:27:17,210
flight data after launch will be the

669
00:27:20,769 --> 00:27:19,190
whole team are gonna you know following

670
00:27:22,389 --> 00:27:20,779
along after we launch it's not just

671
00:27:25,060 --> 00:27:22,399
launched and then docking and then hatch

672
00:27:27,369 --> 00:27:25,070
opening which is very exciting we're

673
00:27:29,229 --> 00:27:27,379
going to make sure that we follow along

674
00:27:31,479 --> 00:27:29,239
all of the post flight reports look for

675
00:27:33,669 --> 00:27:31,489
anything that has anything we can do

676
00:27:35,799 --> 00:27:33,679
better next time lessons learned and

677
00:27:38,320 --> 00:27:35,809
yeah so we're gonna be trying to do that

678
00:27:40,479 --> 00:27:38,330
in phases and and as we're developing

679
00:27:43,149 --> 00:27:40,489
the next vehicles in line to they're in

680
00:27:45,369 --> 00:27:43,159
production as well now is it is it the

681
00:27:48,489 --> 00:27:45,379
intent of the Commercial Crew program to

682
00:27:51,190 --> 00:27:48,499
start inviting other commercial entities

683
00:27:54,489 --> 00:27:51,200
into into the game you know so right now

684
00:27:57,999 --> 00:27:54,499
you work with SpaceX and Boeing correct

685
00:27:59,830 --> 00:27:58,009
and is is are there any other contenders

686
00:28:06,370 --> 00:27:59,840
if you will that are that are looking to

687
00:28:07,900 --> 00:28:06,380
be part of this this era of space flight

688
00:28:11,590 --> 00:28:07,910

now we're working with Boeing and SpaceX

689
00:28:13,120 --> 00:28:11,600
you know to transport our American

690
00:28:14,290 --> 00:28:13,130
astronauts back up to the International

691
00:28:16,450 --> 00:28:14,300
Space Station I think that's our

692
00:28:18,610 --> 00:28:16,460
pressing need right now is to make sure

693
00:28:20,140 --> 00:28:18,620
that we have that presence that US

694
00:28:22,510 --> 00:28:20,150
presence on the international space

695
00:28:24,730 --> 00:28:22,520
nation so we're working right now really

696
00:28:26,860 --> 00:28:24,740
closely with SpaceX and Boeing and

697
00:28:28,750 --> 00:28:26,870
trying to to keep that presence and as

698
00:28:30,280 --> 00:28:28,760
Steve talked about a little bit early

699
00:28:32,320 --> 00:28:30,290
about getting in that cadence

700
00:28:34,960 --> 00:28:32,330
operational cadence of having those

701
00:28:37,900 --> 00:28:34,970
operational missions and be able to keep

702
00:28:40,540 --> 00:28:37,910
the ISS with that US presence that that

703
00:28:43,600 --> 00:28:40,550
we want to make sure we keep very good

704
00:28:46,120 --> 00:28:43,610
now so you are obviously very keen on on

705
00:28:47,920 --> 00:28:46,130
being able to it's almost like starting

706
00:28:51,330 --> 00:28:47,930
the shuttle program all over again

707
00:28:53,590 --> 00:28:51,340
if you will what would you say to folks

708
00:28:55,900 --> 00:28:53,600
young folks there's some people in our

709
00:28:58,750 --> 00:28:55,910
now audience who are interested in being

710
00:28:59,860 --> 00:28:58,760
part of of NASA and what they do what

711
00:29:01,930 --> 00:28:59,870
would you tell them what would you say

712
00:29:05,770 --> 00:29:01,940
to our audience right now you know I

713
00:29:07,330 --> 00:29:05,780

always use one word persistence and I

714
00:29:09,670 --> 00:29:07,340
kind of go back to it's in my history

715
00:29:13,750 --> 00:29:09,680
and my mother's a teacher so I'm

716
00:29:15,430 --> 00:29:13,760
approved to say this but you know I love

717
00:29:17,110 --> 00:29:15,440
science and math and I love those

718
00:29:20,350 --> 00:29:17,120
subjects that get you into engineering

719
00:29:23,050 --> 00:29:20,360
school but you know I wasn't always the

720
00:29:26,110 --> 00:29:23,060
the top of the class every time you know

721
00:29:28,240 --> 00:29:26,120
but I was super persistent and my

722
00:29:30,040 --> 00:29:28,250
brother showed me how to launch Rutan

723
00:29:32,140 --> 00:29:30,050
model rockets when I was a kid you know

724
00:29:34,420 --> 00:29:32,150
I would kind of got interested in the

725
00:29:36,460 --> 00:29:34,430
space program I always thought he was

726
00:29:39,130 --> 00:29:36,470
gonna go to space program but you know I

727
00:29:40,240 --> 00:29:39,140
I was persistent I went into engineering

728
00:29:42,490 --> 00:29:40,250
school and then I said you know what I

729
00:29:45,040 --> 00:29:42,500
want to go and work at the Space Center

730
00:29:48,160 --> 00:29:45,050
and it took a couple of calls you know

731
00:29:50,200 --> 00:29:48,170
it callbacks and try to to get there but

732
00:29:52,210 --> 00:29:50,210
as Steve also mentioned once you get

733
00:29:54,910 --> 00:29:52,220
your foot in the door man I was I was

734
00:29:56,350 --> 00:29:54,920
excited about being able to work on the

735
00:29:58,120 --> 00:29:56,360
space shuttle started working on the

736
00:30:01,510 --> 00:29:58,130
space shuttles and just doing everything

737
00:30:02,980 --> 00:30:01,520
I could to learn about this about this

738
00:30:05,530 --> 00:30:02,990

vehicle and then move into different

739
00:30:08,500 --> 00:30:05,540
areas I started off in engineering on

740
00:30:10,240 --> 00:30:08,510
the working on tiles what you see on the

741
00:30:12,040 --> 00:30:10,250
on the on the bottom of the Space

742
00:30:14,290 --> 00:30:12,050
Shuttle so I started off in tile

743
00:30:16,960 --> 00:30:14,300
engineering and then I've moved into

744
00:30:19,000 --> 00:30:16,970
operations and you know just like I said

745
00:30:19,640 --> 00:30:19,010
being persistent and what I wanted to do

746
00:30:22,310 --> 00:30:19,650
and keep

747
00:30:24,080 --> 00:30:22,320
having those goals you don't always have

748
00:30:26,210 --> 00:30:24,090
to be the the best in your class but

749
00:30:28,010 --> 00:30:26,220
just keep working for what you want it's

750
00:30:30,050 --> 00:30:28,020
amazing you know this is perfectly in

751
00:30:32,870 --> 00:30:30,060
line with some of what the other leaders

752
00:30:35,300 --> 00:30:32,880
that we've had here say that there is no

753
00:30:37,430 --> 00:30:35,310
straight line you know you go your path

754
00:30:40,250 --> 00:30:37,440
is your path and you'll find that like

755
00:30:42,830 --> 00:30:40,260
everybody has a story as to what they

756
00:30:44,660 --> 00:30:42,840
did and how long they did it for it who

757
00:30:46,700 --> 00:30:44,670
they work for and the things they got to

758
00:30:48,770 --> 00:30:46,710
experience to take them to where they

759
00:30:51,950 --> 00:30:48,780
are they are today so it's always fun

760
00:30:53,720 --> 00:30:51,960
and interesting seeing how many of the

761
00:30:55,340 --> 00:30:53,730
different leaders across NASA have

762
00:30:57,620 --> 00:30:55,350
gotten to the place where they are and

763
00:30:59,930 --> 00:30:57,630

obviously doing some phenomenal things

764
00:31:01,640 --> 00:30:59,940
because without your leadership we

765
00:31:07,820 --> 00:31:01,650
couldn't be we wouldn't be able to do

766
00:31:09,500 --> 00:31:07,830
these things today coming from online

767
00:31:12,260 --> 00:31:09,510
what's your favorite part about working

768
00:31:16,400 --> 00:31:12,270
in the Commercial Crew program you know

769
00:31:18,730 --> 00:31:16,410
I have to say it's our team we have an

770
00:31:22,370 --> 00:31:18,740
outstanding team being able to work with

771
00:31:23,570 --> 00:31:22,380
people from all over the agency being

772
00:31:26,210 --> 00:31:23,580
able to work with these commercial

773
00:31:29,330 --> 00:31:26,220
providers - it's very exciting to be

774
00:31:31,220 --> 00:31:29,340
able to learn from them when you know we

775
00:31:33,410 --> 00:31:31,230
as NASA we have this heritage we have

776
00:31:35,090 --> 00:31:33,420
this excitement of being able to work

777
00:31:37,730 --> 00:31:35,100
with the the shuttles and all of this

778
00:31:39,680 --> 00:31:37,740
knowledge and expertise but also

779
00:31:41,990 --> 00:31:39,690
learning from some of the newer ideas

780
00:31:43,520 --> 00:31:42,000
that these commercial providers have had

781
00:31:47,510 --> 00:31:43,530
that's also very exciting so I think

782
00:31:49,700 --> 00:31:47,520
it's our collective team of experts that

783
00:31:53,030 --> 00:31:49,710
we have teamed up with commercial

784
00:31:54,860 --> 00:31:53,040
partners it's I think it's it's

785
00:31:56,510 --> 00:31:54,870
refreshing getting back into this mode

786
00:31:59,300 --> 00:31:56,520
of being able to launch the humans I

787
00:32:01,790 --> 00:31:59,310
think we've been you know we've been in

788
00:32:04,610 --> 00:32:01,800

the mode of really working hard to try

789
00:32:06,590 --> 00:32:04,620
to certify these vehicles and to see the

790
00:32:07,700 --> 00:32:06,600
results and getting this launch off

791
00:32:09,710 --> 00:32:07,710
tomorrow I think it's going to be

792
00:32:11,900 --> 00:32:09,720
exciting for a whole team and a good

793
00:32:14,390 --> 00:32:11,910
reward that we've been working for so

794
00:32:16,670 --> 00:32:14,400
long on very cool what do you think

795
00:32:18,680 --> 00:32:16,680
you'll be tomorrow for the launch I am

796
00:32:21,050 --> 00:32:18,690
going to be in one of our support areas

797
00:32:23,420 --> 00:32:21,060
that we call hangar AE so I'm gonna be

798
00:32:25,760 --> 00:32:23,430
over there watching the launch from

799
00:32:27,770 --> 00:32:25,770
there we and will probably step outside

800
00:32:31,460 --> 00:32:27,780
briefly so I can actually see it at the

801
00:32:32,899 --> 00:32:31,470
outside you know but I could be anywhere

802
00:32:35,389 --> 00:32:32,909
to be honest you know

803
00:32:37,969 --> 00:32:35,399
a lot of I would be happy being at home

804
00:32:40,419 --> 00:32:37,979
and being able to just say that I am a

805
00:32:43,190 --> 00:32:40,429
part of this mission you know so it's

806
00:32:47,299 --> 00:32:43,200
I'm excited that they're doing the

807
00:32:48,799 --> 00:32:47,309
virtual you know launch viewing so that

808
00:32:50,570 --> 00:32:48,809
everybody I've been sending out to all

809
00:32:52,580 --> 00:32:50,580
my friends across the country hey watch

810
00:32:55,219 --> 00:32:52,590
this you know and it kind of gives them

811
00:32:56,719 --> 00:32:55,229
more of an opportunity for the folks to

812
00:32:58,759 --> 00:32:56,729
be able to watch it virtually that can't

813
00:33:00,769 --> 00:32:58,769

come down here and see the launch for

814
00:33:02,570 --> 00:33:00,779
themselves so I would definitely say

815
00:33:04,639 --> 00:33:02,580
regardless of where you are just have

816
00:33:06,529 --> 00:33:04,649
that bottle of champagne right because

817
00:33:07,879 --> 00:33:06,539
we have to think positively and know

818
00:33:10,029 --> 00:33:07,889
that we're gonna have a successful

819
00:33:12,560 --> 00:33:10,039
launch tomorrow all that hard work

820
00:33:14,060 --> 00:33:12,570
across all the teams all the people you

821
00:33:16,129 --> 00:33:14,070
work with it definitely wasn't for

822
00:33:18,310 --> 00:33:16,139
nothing right and no matter what I'm

823
00:33:20,419 --> 00:33:18,320
NASA NASA is definitely good at

824
00:33:22,729 --> 00:33:20,429
persevering and in overcoming any

825
00:33:26,089 --> 00:33:22,739
challenges and making some amazing

826
00:33:28,279 --> 00:33:26,099
things happen you know with that Dana we

827
00:33:31,159 --> 00:33:28,289
want to thank you so much for coming out

828
00:33:35,330 --> 00:33:31,169
here and and giving us some insight into

829
00:33:37,159 --> 00:33:35,340
from a program level all the work and

830
00:33:39,049 --> 00:33:37,169
all the things and all the teams that it

831
00:33:41,089 --> 00:33:39,059
takes to really pull something like this

832
00:33:43,789 --> 00:33:41,099
together some people I think Steve

833
00:33:45,529 --> 00:33:43,799
mentioned it earlier that it's you know

834
00:33:48,409 --> 00:33:45,539
people a lot of people they just see the

835
00:33:50,899 --> 00:33:48,419
rocket light up and it launches but

836
00:33:52,999 --> 00:33:50,909
there is so much work years of work that

837
00:33:56,239 --> 00:33:53,009
goes behind pulling all of this together

838
00:33:58,519 --> 00:33:56,249

and again you know your leadership being

839
00:34:00,619 --> 00:33:58,529
persistent as you as you mentioned and

840
00:34:05,599 --> 00:34:00,629
all the hard work that you guys put in

841
00:34:07,310 --> 00:34:05,609
is definitely visible to everybody so

842
00:34:08,599 --> 00:34:07,320
thank you thank you so much for coming

843
00:34:11,210 --> 00:34:08,609
here and spending some time with us and

844
00:34:12,680 --> 00:34:11,220
educating on all our viewers with with

845
00:34:15,649 --> 00:34:12,690
everything that we have going on and

846
00:34:18,019 --> 00:34:15,659
with that guys you know I just want to

847
00:34:20,899 --> 00:34:18,029
let you know it is about 433 right now

848
00:34:23,990 --> 00:34:20,909
so about 24 hours from now it will be

849
00:34:26,839 --> 00:34:24,000
launch time okay so please tune in

850
00:34:28,369 --> 00:34:26,849
tomorrow we still have a few more shows

851
00:34:30,619 --> 00:34:28,379
for you I'm starting at nine o'clock

852
00:34:32,899 --> 00:34:30,629
we'll we'll have some shows so please

853
00:34:35,629 --> 00:34:32,909
tune in once again live and check out

854
00:34:37,849 --> 00:34:35,639
check out what we have to show you keep

855
00:34:39,649 --> 00:34:37,859
your questions coming we want you guys

856
00:34:41,059 --> 00:34:39,659
to be all part of this that's why we're

857
00:34:42,769 --> 00:34:41,069
doing it virtual we want you to be able

858
00:34:44,930 --> 00:34:42,779
to ask questions and keep the questions

859
00:34:45,990 --> 00:34:44,940
coming talk to our leaders understand

860
00:34:47,970 --> 00:34:46,000
what it really takes

861
00:34:50,310 --> 00:34:47,980
us to do everything that we do out here

862
00:34:52,770 --> 00:34:50,320
I'm Phil thank you for for riding with

863
00:34:56,970 --> 00:34:52,780

me Dana thank you again I wanted to say

864
00:34:59,040 --> 00:34:56,980
a huge thank to Steve and our comm team

865
00:35:01,980 --> 00:34:59,050
here at NASA who put all of this

866
00:35:04,200 --> 00:35:01,990
together just so that you can see you

867
00:35:06,060 --> 00:35:04,210
can view you can hear you can ask and be

868
00:35:06,720 --> 00:35:06,070
part of what we do here thank you for

869
00:35:08,850 --> 00:35:06,730
your support