1
00:00:08,169 --> 00:00:05,020
good afternoon and welcome everyone to

2
00:00:11,259 --> 00:00:08,179
today's SpaceX commercial resupply

3
00:00:12,909 --> 00:00:11,269
services five pre-launch news conference

4
00:00:14,619 --> 00:00:12,919
live from Kennedy Space Center in

5
00:00:17,679 --> 00:00:14,629
Florida we're getting ready for the

6
00:00:20,410 --> 00:00:17,689
launch of Dragon and Falcon tomorrow

7
00:00:22,570 --> 00:00:20,420
morning 6:20 a.m. Eastern Time and here

8
00:00:24,519 --> 00:00:22,580
with us to talk about preparations and

9
00:00:26,470 --> 00:00:24,529
getting ready for the flight our to my

10
00:00:31,290 --> 00:00:26,480
left International Space Station program

11
00:00:34,209 --> 00:00:31,300
manager Mike Suffredini to his left

12
00:00:38,110 --> 00:00:34,219
hotends Kuhn examined vice-president of

13
00:00:40,810 --> 00:00:38,120

mission assurance for SpaceX and major

14
00:00:43,930 --> 00:00:40,820
Perry sweat from the United States Air

15
00:00:45,790 --> 00:00:43,940
Force 45th weather squadron and we'll

16
00:00:46,930 --> 00:00:45,800
begin with some opening remarks and then

17
00:00:49,959 --> 00:00:46,940
we'll be happy to take questions

18
00:00:52,000 --> 00:00:49,969
mr. Suffredini good afternoon it's great

19
00:00:54,599 --> 00:00:52,010
to be here on the first launch of the

20
00:00:57,240 --> 00:00:54,609
year to the International Space Station

21
00:01:01,660 --> 00:00:57,250
spacex 5 of course is carrying

22
00:01:04,990 --> 00:01:01,670
much-needed cargo to the to the orbiting

23
00:01:07,600 --> 00:01:05,000
outpost the SpaceX folks have worked

24
00:01:10,630 --> 00:01:07,610
really closely with us this time of all

25
00:01:13,240 --> 00:01:10,640
the cargo on board we have about a 1.8

26
00:01:14,560 --> 00:01:13,250
metric tons of pressurized cargo I think

27
00:01:18,490 --> 00:01:14,570
that's the most we've crammed into a

28
00:01:20,950 --> 00:01:18,500
dragon to date and that's been with the

29
00:01:24,069 --> 00:01:20,960
help of the SpaceX folks have used quite

30
00:01:25,740 --> 00:01:24,079
a bit of ingenuity to help us put items

31
00:01:29,139 --> 00:01:25,750
and all the little cracks and crevices

32
00:01:31,149 --> 00:01:29,149
as we kind of lean on the Dragon vehicle

33
00:01:33,460 --> 00:01:31,159
to supply ISS here for the next little

34
00:01:37,359 --> 00:01:33,470
while until the orbital folks are flying

35
00:01:38,800 --> 00:01:37,369
again this year of course is no

36
00:01:40,210 --> 00:01:38,810
different than any other year that I've

37
00:01:43,719 --> 00:01:40,220
been in this program there's always

38
00:01:45,310 --> 00:01:43,729

major changes happening on board and of

39
00:01:48,219 --> 00:01:45,320
course now we have a full breadth of

40
00:01:49,959 --> 00:01:48,229
research going on as well I know Julie

41
00:01:51,880 --> 00:01:49,969
and folks chatted with you about the

42
00:01:55,149 --> 00:01:51,890
research specifically so well I won't

43
00:01:57,730 --> 00:01:55,159
dwell on that but the program is got a

44
00:02:00,310 --> 00:01:57,740
couple of major changes happening this

45
00:02:02,709 --> 00:02:00,320
year the first one is we're configuring

46
00:02:04,990 --> 00:02:02,719
the vehicle to have docking again for

47
00:02:06,340 --> 00:02:05,000
the first time on ISS and shuttle

48
00:02:08,590 --> 00:02:06,350
retired

49
00:02:11,290 --> 00:02:08,600
we call it the International docking

50
00:02:13,870 --> 00:02:11,300
adapter we intend to have two onboard

51
00:02:16,330 --> 00:02:13,880
the station a one in the forward

52
00:02:18,340 --> 00:02:16,340
where the where shovels used to dock and

53
00:02:22,060 --> 00:02:18,350
then another one on the zenith port if

54
00:02:25,030 --> 00:02:22,070
no to that work includes the two docking

55
00:02:28,840 --> 00:02:25,040
ports rearranging the vehicle to move

56
00:02:31,390 --> 00:02:28,850
the pressurized multi-purpose module

57
00:02:33,190 --> 00:02:31,400
that is sitting on node one nadir we're

58
00:02:35,890 --> 00:02:33,200
gonna move that to node three forward

59
00:02:38,410 --> 00:02:35,900
we're gonna move PMA three off the end

60
00:02:40,030 --> 00:02:38,420
of node 3 and put it on no to zenith so

61
00:02:42,820 --> 00:02:40,040
the other docking adapter can be put

62
00:02:46,720 --> 00:02:42,830
there and then birthings will occur at

63
00:02:49,000 --> 00:02:46,730

node 2 nadir and node 1 nadir in

64
00:02:52,810 --> 00:02:49,010
addition to the docking systems we also

65
00:02:55,270 --> 00:02:52,820
have to install the targets necessary to

66
00:02:57,130 --> 00:02:55,280
allow the in the closing proximity

67
00:02:58,840 --> 00:02:57,140
operations to occur and the

68
00:03:00,460 --> 00:02:58,850
communication system so we're gonna have

69
00:03:02,620 --> 00:03:00,470
a different communication systems on

70
00:03:05,080 --> 00:03:02,630
board in order to allow command and

71
00:03:07,360 --> 00:03:05,090
control between the ISS and the

72
00:03:10,030 --> 00:03:07,370
approaching vehicles so this is quite a

73
00:03:12,100 --> 00:03:10,040
bit of work our plan has always been to

74
00:03:14,680 --> 00:03:12,110
have a docking capability in place and

75
00:03:17,680 --> 00:03:14,690
operational by the end of 2015 and we're

76
00:03:21,040 --> 00:03:17,690
still on track to do that the first real

77
00:03:22,510 --> 00:03:21,050
steps you'll see us take and and Dragon

78
00:03:26,650 --> 00:03:22,520
is bringing up some of this hardware is

79
00:03:29,140 --> 00:03:26,660
to these three EVs that'll occur once

80
00:03:31,090 --> 00:03:29,150
dragon arrives and get settled in we

81
00:03:33,850 --> 00:03:31,100
have three days they're going to start

82
00:03:36,400 --> 00:03:33,860
the reconfiguration work once the EVs

83
00:03:38,050 --> 00:03:36,410
are complete then at some point in the

84
00:03:40,060 --> 00:03:38,060
future we'll be ready to move the PMM

85
00:03:41,920 --> 00:03:40,070
whenever the ops team is is ready to

86
00:03:45,340 --> 00:03:41,930
make that that move and that'll be the

87
00:03:47,560 --> 00:03:45,350
most obvious change until spacex 7

88
00:03:49,150 --> 00:03:47,570

arrives with the first of the docking

89
00:03:52,510 --> 00:03:49,160
adapters that will be installed and that

90
00:03:57,010 --> 00:03:52,520
one will be on on node 2 forward so all

91
00:03:58,630 --> 00:03:57,020
that work is is on track and we'll have

92
00:04:00,400 --> 00:03:58,640
it all complete as I said by the end of

93
00:04:01,210 --> 00:04:00,410
this calendar year that's the that's the

94
00:04:03,400 --> 00:04:01,220
plan right now

95
00:04:05,280 --> 00:04:03,410
in addition that of course we have the

96
00:04:08,620 --> 00:04:05,290
very exciting one-year mission coming up

97
00:04:10,720 --> 00:04:08,630
and it's that crew launches to the

98
00:04:13,810 --> 00:04:10,730
International Space Station Scott and

99
00:04:15,520 --> 00:04:13,820
McHale will launch this March at the end

100
00:04:18,070 --> 00:04:15,530
of this March and begin their one-year

101
00:04:22,000 --> 00:04:18,080
increment onboard ISS and of course that

102
00:04:24,040 --> 00:04:22,010
is a big step towards human exploration

103
00:04:26,680 --> 00:04:24,050
beyond low Earth orbit we always talk

104
00:04:27,680 --> 00:04:26,690
about ISS being the first step this is a

105
00:04:30,140 --> 00:04:27,690
pretty big

106
00:04:31,880 --> 00:04:30,150
part of that first step is to to do this

107
00:04:33,950 --> 00:04:31,890
one-year mission and and study the

108
00:04:36,800 --> 00:04:33,960
effects it has this is the first of

109
00:04:38,960 --> 00:04:36,810
several we hope to do over over the next

110
00:04:41,990 --> 00:04:38,970
several years and so we're looking

111
00:04:44,330 --> 00:04:42,000
forward to that as well and so with that

112
00:04:47,300 --> 00:04:44,340
I'll pass on the Hans who will talk to

113
00:04:50,150 --> 00:04:47,310

you about the SpaceX readiness yeah

114
00:04:51,500 --> 00:04:50,160
thank you very much and happy new year

115
00:04:53,930 --> 00:04:51,510
and really happy to be here for the

116
00:04:57,590 --> 00:04:53,940
first mission in 2015

117
00:05:01,180 --> 00:04:57,600
5:09 flight 14 and for Dragon it's

118
00:05:04,640 --> 00:05:01,190
actually the seventh flight CRS five

119
00:05:07,250 --> 00:05:04,650
it's gonna be a I want to point out I do

120
00:05:10,550 --> 00:05:07,260
expect attention on the on the first

121
00:05:12,050 --> 00:05:10,560
stage manoeuvres and landing but I do

122
00:05:14,270 --> 00:05:12,060
want to point out that the main mission

123
00:05:15,560 --> 00:05:14,280
is absolutely to get the cargo to the

124
00:05:18,320 --> 00:05:15,570
station and to make sure that the

125
00:05:22,910 --> 00:05:18,330
station supply is steady and unstable

126
00:05:25,880 --> 00:05:22,920
and unreliable and that SpaceX basically

127
00:05:27,710 --> 00:05:25,890
does everything they can to to keep this

128
00:05:29,960 --> 00:05:27,720
up and make sure that you get all the

129
00:05:33,380 --> 00:05:29,970
cargo you need whether it's experiments

130
00:05:36,020 --> 00:05:33,390
or supplies as always there's a mix of

131
00:05:37,700 --> 00:05:36,030
that on Dragon there's also going to be

132
00:05:39,860 --> 00:05:37,710
external payloads I think there's one

133
00:05:40,430 --> 00:05:39,870
external payload this time I'm flying in

134
00:05:46,130 --> 00:05:40,440
the trunk

135
00:05:49,460 --> 00:05:46,140
it's going to be extracted as part of

136
00:05:50,900 --> 00:05:49,470
the other mission I can talk about a

137
00:05:55,310 --> 00:05:50,910
little bit about the the main mission

138
00:05:57,140 --> 00:05:55,320

here um it's a essentially very similar

139
00:06:02,380 --> 00:05:57,150
to the last year's full mission that we

140
00:06:05,120 --> 00:06:02,390
had and I think it was a Templar and

141
00:06:07,010 --> 00:06:05,130
basically first stage burned for you

142
00:06:08,840 --> 00:06:07,020
what you see here and you and you sit on

143
00:06:10,790 --> 00:06:08,850
the lower side it's going to be very

144
00:06:12,860 --> 00:06:10,800
similar it's going to be at close to

145
00:06:15,050 --> 00:06:12,870
three-minute burn then stage separation

146
00:06:17,420 --> 00:06:15,060
he both through the second stage ignited

147
00:06:19,010 --> 00:06:17,430
the weather is favorable and you will

148
00:06:22,610 --> 00:06:19,020
see the second stage continued for

149
00:06:25,280 --> 00:06:22,620
another seven minutes before we get into

150
00:06:28,430 --> 00:06:25,290
orbit in orbit will take us 30 seconds

151
00:06:31,970 --> 00:06:28,440
priming and maneuvering until we deploy

152
00:06:34,159 --> 00:06:31,980
dragon there's nothing different from

153
00:06:36,590 --> 00:06:34,169
the last mission as far as you can tell

154
00:06:38,640 --> 00:06:36,600
from the outside it's going to be some

155
00:06:41,580 --> 00:06:38,650
differences after that and

156
00:06:43,860 --> 00:06:41,590
I get to that in a second before that I

157
00:06:46,170 --> 00:06:43,870
continue with dragon dragon continues

158
00:06:49,680 --> 00:06:46,180
for about two days it's actually 44

159
00:06:52,379 --> 00:06:49,690
hours on orbit maneuvering and phasing

160
00:06:56,450 --> 00:06:52,389
and height adjustments until it will be

161
00:07:00,090 --> 00:06:56,460
grappled by the station arm once it is

162
00:07:02,999 --> 00:07:00,100
birthed to the station it will stay

163
00:07:07,080 --> 00:07:03,009

there for currently scheduled 30 days

164
00:07:09,360 --> 00:07:07,090
about I think February 7 is the current

165
00:07:14,730 --> 00:07:09,370
release date deploy date from the

166
00:07:17,730 --> 00:07:14,740
station and then come back and get water

167
00:07:20,310 --> 00:07:17,740
in the Pacific a couple hundred miles to

168
00:07:24,360 --> 00:07:20,320
the west of Long Beach we will wait

169
00:07:25,890 --> 00:07:24,370
there at the boat and catch dragon

170
00:07:28,830 --> 00:07:25,900
basically and put it on the boat and

171
00:07:31,650 --> 00:07:28,840
bring it back to the harbor for further

172
00:07:36,270 --> 00:07:31,660
payload downtown payload in that case

173
00:07:40,050 --> 00:07:36,280
processing and that will then the be the

174
00:07:42,150 --> 00:07:40,060
end of the mission so when the first in

175
00:07:43,529 --> 00:07:42,160
the second stage separate the first

176
00:07:46,230 --> 00:07:43,539
stage will continue and they will

177
00:07:50,550 --> 00:07:46,240
continue on a secondary non mission

178
00:07:54,149 --> 00:07:50,560
critical I guess experiment to some

179
00:07:56,040 --> 00:07:54,159
extent it will turn around it will

180
00:08:00,719 --> 00:07:56,050
perform a what's called a boost back

181
00:08:05,120 --> 00:08:00,729
burn that boots back burn brings the

182
00:08:10,050 --> 00:08:05,130
stage closer closer back in it will then

183
00:08:11,969 --> 00:08:10,060
continue to just coast and as it gets

184
00:08:13,469 --> 00:08:11,979
into closer to the atmosphere it will

185
00:08:16,050 --> 00:08:13,479
perform an entry per and the entry burn

186
00:08:18,659 --> 00:08:16,060
will slow the stage down and that

187
00:08:21,839 --> 00:08:18,669
reduces the loads on the stage so it's

188
00:08:23,730 --> 00:08:21,849

uh it's supposed to - putting the stage

189
00:08:25,500 --> 00:08:23,740
then through the atmosphere and that

190
00:08:27,649 --> 00:08:25,510
will be followed by a landing burn and

191
00:08:32,490 --> 00:08:27,659
the landing burn is targeted to a

192
00:08:35,640 --> 00:08:32,500
autonomous spaceport thrown ship that is

193
00:08:37,529 --> 00:08:35,650
the official word for it so the drone

194
00:08:38,850 --> 00:08:37,539
ship sits there right now and it's

195
00:08:43,140 --> 00:08:38,860
basically waiting for the mission to

196
00:08:46,890 --> 00:08:43,150
happen that I'm pretty sure this will be

197
00:08:48,690 --> 00:08:46,900
will be very exciting it's as I said

198
00:08:52,320 --> 00:08:48,700
it's an experiment

199
00:08:53,820 --> 00:08:52,330
there's a so certain likelihood that

200
00:08:55,680 --> 00:08:53,830
this will not work out right that

201
00:08:58,320 --> 00:08:55,690
something will go wrong it's the first

202
00:09:01,590 --> 00:08:58,330
time we try this nobody as I ever tried

203
00:09:04,020 --> 00:09:01,600
that to our knowledge and and so

204
00:09:09,750 --> 00:09:04,030
currently Ilan put a probability of 50%

205
00:09:11,820 --> 00:09:09,760
on this on this part really as an

206
00:09:14,010 --> 00:09:11,830
experimental part basically of the

207
00:09:16,560 --> 00:09:14,020
emission again it's not part of the

208
00:09:18,960 --> 00:09:16,570
mission you will focus no entire company

209
00:09:21,300 --> 00:09:18,970
you've worked very hard to make the ICS

210
00:09:22,020 --> 00:09:21,310
part and the ascent part and the cargo

211
00:09:24,810 --> 00:09:22,030
part

212
00:09:26,010 --> 00:09:24,820
happen I just wanted to bring it up on

213
00:09:29,310 --> 00:09:26,020

the side because I guess you're probably

214
00:09:33,240 --> 00:09:29,320
interested in that too I guess what's

215
00:09:36,540 --> 00:09:33,250
all I had major all right good afternoon

216
00:09:38,940 --> 00:09:36,550
well after a warm weekend of the Space

217
00:09:41,550 --> 00:09:38,950
Coast we are seeing that increased

218
00:09:43,680 --> 00:09:41,560
cloudiness and wind shift around from

219
00:09:45,420 --> 00:09:43,690
the south to the north associated with a

220
00:09:47,340 --> 00:09:45,430
cold front that has since moved into our

221
00:09:49,050 --> 00:09:47,350
area and slowed down and over the

222
00:09:53,580 --> 00:09:49,060
Central Coast over the Central Florida

223
00:09:58,410 --> 00:09:53,590
area I should say as we get into excuse

224
00:10:00,330 --> 00:09:58,420
me fortunately that front will not stall

225
00:10:02,280 --> 00:10:00,340
out I like the last one did and will

226
00:10:04,740 --> 00:10:02,290
continue to slowly push to the south and

227
00:10:06,390 --> 00:10:04,750
what that means is the cloudiness will

228
00:10:08,430 --> 00:10:06,400
decrease the clouds will start to thin

229
00:10:09,990 --> 00:10:08,440
out and that has allowed us to decrease

230
00:10:11,970 --> 00:10:10,000
our probability of violations from 40%

231
00:10:15,060 --> 00:10:11,980
that we had over the past couple days to

232
00:10:17,370 --> 00:10:15,070
30% as we do have now we can go to the

233
00:10:19,170 --> 00:10:17,380
visible satellite shot please you can

234
00:10:22,290 --> 00:10:19,180
see those clouds a little as the Sun

235
00:10:23,670 --> 00:10:22,300
slowly starts to go down you can see you

236
00:10:25,350 --> 00:10:23,680
can still see the clouds there associate

237
00:10:26,550 --> 00:10:25,360
with the front again slowly start and

238
00:10:28,530 --> 00:10:26,560

move to the southeast and we really

239
00:10:29,910 --> 00:10:28,540
won't see a good push of clouds move out

240
00:10:32,190 --> 00:10:29,920
until Wednesday on Thursday that's when

241
00:10:35,220 --> 00:10:32,200
we'll really see those that front make

242
00:10:37,530 --> 00:10:35,230
its way to the southeast so for tomorrow

243
00:10:39,180 --> 00:10:37,540
morning we are looking at scattered

244
00:10:40,710 --> 00:10:39,190
clouds in the lower levels and mid

245
00:10:43,190 --> 00:10:40,720
levels and then the upper levels will be

246
00:10:45,000 --> 00:10:43,200
mostly cloudy skies at about 24,000 feet

247
00:10:47,190 --> 00:10:45,010
you can see right there the forecast

248
00:10:49,440 --> 00:10:47,200
2,000 feet scattered scattered in the

249
00:10:51,990 --> 00:10:49,450
mid levels and broken about 24,000 feet

250
00:10:53,730 --> 00:10:52,000
and the mid-levels is really will where

251
00:10:55,710 --> 00:10:53,740
we will be focused is associated with a

252
00:10:57,030 --> 00:10:55,720
thick cloud rule we'll be looking at

253
00:10:59,160 --> 00:10:57,040
clouds anywhere between 0 degrees and

254
00:11:00,860 --> 00:10:59,170
minus 20 degrees Celsius and in this

255
00:11:02,750 --> 00:11:00,870
case that's about 15 to 20

256
00:11:05,329 --> 00:11:02,760
feet so in that areas we'll be looking

257
00:11:06,620 --> 00:11:05,339
for clouds over the launchpad and seeing

258
00:11:09,620 --> 00:11:06,630
of the cloud any part of that cloud deck

259
00:11:12,790 --> 00:11:09,630
is that's greater than 45 or 4500 feet

260
00:11:14,960 --> 00:11:12,800
thick is between 15 and 20,000 feet

261
00:11:16,820 --> 00:11:14,970
visibility no issues winds will be on

262
00:11:18,650 --> 00:11:16,830
the north-northeast at 5 to 10 miles an

263
00:11:20,930 --> 00:11:18,660

hour and no issues with weather and

264
00:11:22,850 --> 00:11:20,940
temperature about 64 degrees again a 30%

265
00:11:25,220 --> 00:11:22,860
chance of violation associated with the

266
00:11:26,870 --> 00:11:25,230
cloud rule if we go to the Friday

267
00:11:28,100 --> 00:11:26,880
morning if we have to slip into slip

268
00:11:29,510 --> 00:11:28,110
into Friday morning I really know what

269
00:11:30,829 --> 00:11:29,520
he's with clouds our concern really

270
00:11:33,440 --> 00:11:30,839
becomes more of an issue with the flight

271
00:11:34,880 --> 00:11:33,450
through precip when we see the onshore

272
00:11:37,220 --> 00:11:34,890
flow and this isn't really a direct

273
00:11:38,930 --> 00:11:37,230
onshore flow we're seeing more of a with

274
00:11:41,930 --> 00:11:38,940
the north-northeast conditions as more

275
00:11:43,070 --> 00:11:41,940
of indirect onshore flow we do increase

276
00:11:44,540 --> 00:11:43,080
our chances of rain showers in the

277
00:11:46,100 --> 00:11:44,550
morning particularly a morning

278
00:11:47,990 --> 00:11:46,110
especially we have two or three days of

279
00:11:49,730 --> 00:11:48,000
onshore flow so that's what we're gonna

280
00:11:51,700 --> 00:11:49,740
be really focused on is the occasional

281
00:11:53,420 --> 00:11:51,710
shower coming across a launch pad and

282
00:11:55,610 --> 00:11:53,430
the concern with a flight through

283
00:11:57,050 --> 00:11:55,620
precipitation so again when's be held in

284
00:11:58,790 --> 00:11:57,060
north northeast 5 to 10 miles an hour

285
00:12:00,740 --> 00:11:58,800
and temperatures will be a little cooler

286
00:12:02,060 --> 00:12:00,750
as that front does finally get make its

287
00:12:03,829 --> 00:12:02,070
way down to the south temperatures will

288
00:12:05,240 --> 00:12:03,839

be about 10 degrees cooler then we will

289
00:12:07,630 --> 00:12:05,250
see tomorrow morning down to about the

290
00:12:10,610 --> 00:12:07,640
mid 50s and only a 20% chance of

291
00:12:11,840 --> 00:12:10,620
Violation anytime we have an

292
00:12:13,490 --> 00:12:11,850
instantaneous window it does make it a

293
00:12:15,230 --> 00:12:13,500
little more dicey because we can't

294
00:12:18,350 --> 00:12:15,240
provide a clear time and things like

295
00:12:20,570 --> 00:12:18,360
that so but otherwise like I said

296
00:12:23,210 --> 00:12:20,580
chances are low for violation looking at

297
00:12:24,980 --> 00:12:23,220
30% for tomorrow morning and 20% for

298
00:12:26,810 --> 00:12:24,990
Friday morning so looking forward to it

299
00:12:29,530 --> 00:12:26,820
and great lunch thank you okay thank you

300
00:12:32,449 --> 00:12:29,540
alright we'll take questions now we have

301
00:12:35,180 --> 00:12:32,459
news media and social media members from

302
00:12:37,160 --> 00:12:35,190
the NASA social here as well as a couple

303
00:12:39,650 --> 00:12:37,170
of reporters on our phone bridge and we

304
00:12:42,350 --> 00:12:39,660
also have opened up for online questions

305
00:12:44,570 --> 00:12:42,360
if you're online you're watching Jason

306
00:12:47,060 --> 00:12:44,580
Townsend from NASA headquarters social

307
00:12:50,660 --> 00:12:47,070
media is here and you can send questions

308
00:12:52,699 --> 00:12:50,670
to the hashtag ask NASA and we will get

309
00:12:55,040 --> 00:12:52,709
to those but we'll start off here for

310
00:12:57,380 --> 00:12:55,050
folks please wait for the microphone

311
00:12:59,019 --> 00:12:57,390
state your name and affiliation and to

312
00:13:04,510 --> 00:12:59,029
whom you're addressing your question and

313
00:13:09,130 --> 00:13:07,000

hello Marcia Dunn Associated Press for

314
00:13:11,230 --> 00:13:09,140
mr. clinics men I'd like to hear a

315
00:13:13,450 --> 00:13:11,240
little bit more about the experiment at

316
00:13:16,660 --> 00:13:13,460
the end of the flight how close will the

317
00:13:19,000 --> 00:13:16,670
closest SpaceX employees be to the drone

318
00:13:23,740 --> 00:13:19,010
when all this is happening how will you

319
00:13:25,750 --> 00:13:23,750
record it also how many by what by what

320
00:13:28,630 --> 00:13:25,760
time do you expect touchdown to occur

321
00:13:30,550 --> 00:13:28,640
and is this all pre-programmed or will

322
00:13:32,590 --> 00:13:30,560
there be flight controllers being able

323
00:13:35,170 --> 00:13:32,600
to divert it if there's a problem of

324
00:13:37,449 --> 00:13:35,180
some sort so the the first stage is

325
00:13:39,810 --> 00:13:37,459
subject to arrange control in terms of

326
00:13:42,340 --> 00:13:39,820
flight safety so that that much is clear

327
00:13:45,790 --> 00:13:42,350
it has its own safety package basically

328
00:13:47,199 --> 00:13:45,800
on board but there's there's no the

329
00:13:49,810 --> 00:13:47,209
autonomous part on the spaceship

330
00:13:51,940 --> 00:13:49,820
indicates there's just nobody nearby on

331
00:13:54,400 --> 00:13:51,950
the on the boat or you know within a

332
00:13:56,590 --> 00:13:54,410
certain safe distance I want to say 10

333
00:13:58,630 --> 00:13:56,600
miles roughly something like that but

334
00:14:01,560 --> 00:13:58,640
I'm not sure about the number it's a

335
00:14:05,730 --> 00:14:01,570
safe distance that basically we the I

336
00:14:08,110 --> 00:14:05,740
believe the Range Safety Office tells us

337
00:14:10,870 --> 00:14:08,120
that some analysis attached to it that

338
00:14:13,150 --> 00:14:10,880

this is a safe distance so no employee

339
00:14:16,570 --> 00:14:13,160
or anybody else is nearby the landing

340
00:14:23,680 --> 00:14:16,580
site or the toy the space port drone

341
00:14:25,990 --> 00:14:23,690
ship so so that that's what what keeps

342
00:14:28,810 --> 00:14:26,000
that safe and I think you asked how we

343
00:14:32,199 --> 00:14:28,820
record this we have cameras on the

344
00:14:34,329 --> 00:14:32,209
vehicle we have telemetry on the vehicle

345
00:14:37,030 --> 00:14:34,339
of course there's going to be a

346
00:14:40,329 --> 00:14:37,040
telemetry boat nearby recording a

347
00:14:42,190 --> 00:14:40,339
telemetry we will not I believe we may

348
00:14:44,410 --> 00:14:42,200
have real-time but we will likely not

349
00:14:47,170 --> 00:14:44,420
have real-time information and I want to

350
00:14:48,519 --> 00:14:47,180
point this out from from the Cape the

351
00:14:51,430 --> 00:14:48,529
landing site is basically over the

352
00:14:53,650 --> 00:14:51,440
horizon and we have no direct connection

353
00:14:55,510 --> 00:14:53,660
we lose we lose the direct connection

354
00:14:59,890 --> 00:14:55,520
with the vehicle on point in time but we

355
00:15:04,360 --> 00:14:59,900
do record the data locally you know near

356
00:15:09,069 --> 00:15:04,370
the near the dropship so that we can

357
00:15:13,410 --> 00:15:09,079
really create whatever happened then how

358
00:15:16,900 --> 00:15:13,420
many minutes oh the time yes so I'm the

359
00:15:18,789 --> 00:15:16,910
the nominal shutdown of the

360
00:15:21,729 --> 00:15:18,799
the first-stage booster is nine minutes

361
00:15:23,650 --> 00:15:21,739
after liftoff it's actually just a

362
00:15:27,279 --> 00:15:23,660
little bit ahead of the Dragon deploy

363
00:15:28,719 --> 00:15:27,289

and we will we will in the webcast we

364
00:15:34,889 --> 00:15:28,729
will focus on the dragon and the main

365
00:15:36,969 --> 00:15:34,899
mission with CBS with two questions

366
00:15:38,979 --> 00:15:36,979
Hans what kind of sea states can you

367
00:15:40,299 --> 00:15:38,989
hand in maybe the weather gentleman can

368
00:15:42,519 --> 00:15:40,309
give us some sense of what the waves are

369
00:15:44,199 --> 00:15:42,529
wherever your drone ship is and I have a

370
00:15:45,729 --> 00:15:44,209
question for Mike after that yeah III

371
00:15:49,989 --> 00:15:45,739
don't know the sea state numbers but I

372
00:15:53,349 --> 00:15:49,999
heard the bass are currently four to ten

373
00:15:56,529 --> 00:15:53,359
feet and for the backup day I heard

374
00:15:58,659 --> 00:15:56,539
numbers up to 14 feet this is neither

375
00:16:01,869 --> 00:15:58,669
runs a problem for the autonomous space

376
00:16:07,059 --> 00:16:01,879
bar on ship its it's pretty heavy it's a

377
00:16:09,939 --> 00:16:07,069
it's a fairly heavy piece of metal so um

378
00:16:12,189 --> 00:16:09,949
and it has it has position correction

379
00:16:16,090 --> 00:16:12,199
for so it doesn't drift away it's

380
00:16:20,139 --> 00:16:16,100
actually very tight position control for

381
00:16:22,960 --> 00:16:20,149
my given given the the incident with the

382
00:16:24,609 --> 00:16:22,970
orbital spacecraft and you don't have

383
00:16:26,289 --> 00:16:24,619
them available for the rest of the year

384
00:16:28,539 --> 00:16:26,299
or at least until the netwo centaur

385
00:16:30,879 --> 00:16:28,549
flies at some point can you give us some

386
00:16:32,739 --> 00:16:30,889
sense of what how your your planning and

387
00:16:34,359 --> 00:16:32,749
strategy is for these resupply flights

388
00:16:35,769 --> 00:16:34,369

in the instance that you had a problem

389
00:16:37,689 --> 00:16:35,779
with SpaceX I mean I don't know if that

390
00:16:39,909 --> 00:16:37,699
makes any sense to you but obviously

391
00:16:41,649 --> 00:16:39,919
your single string now with supply ships

392
00:16:43,359 --> 00:16:41,659
I'm just wondering now that plays into

393
00:16:44,919 --> 00:16:43,369
your planning strategy for these

394
00:16:47,199 --> 00:16:44,929
downstream flights and how important it

395
00:16:50,469 --> 00:16:47,209
is for SpaceX to keep us steady cadence

396
00:16:52,569 --> 00:16:50,479
here so that's answering a couple ways

397
00:16:55,210 --> 00:16:52,579
long-term eventually we need to get the

398
00:16:57,369 --> 00:16:55,220
up mass back that we lost on the orbital

399
00:17:01,689 --> 00:16:57,379
flight but that doesn't have to occur

400
00:17:03,909 --> 00:17:01,699
this year we have made one change in our

401
00:17:07,269 --> 00:17:03,919
plan we we were trying to hold about a

402
00:17:09,220 --> 00:17:07,279
six-month protection on orbit so I had

403
00:17:11,409 --> 00:17:09,230
six months from one supply should flight

404
00:17:12,699 --> 00:17:11,419
to another we're probably going to

405
00:17:14,559 --> 00:17:12,709
dwindle that it's probably gonna doodle

406
00:17:17,199 --> 00:17:14,569
down to close to about four months in

407
00:17:18,519 --> 00:17:17,209
order to fly the research hard we want

408
00:17:20,949 --> 00:17:18,529
to do and all the other things that we

409
00:17:22,419 --> 00:17:20,959
want to set up and so we're flirting

410
00:17:24,639 --> 00:17:22,429
we're floating somewhere around that

411
00:17:27,100 --> 00:17:24,649
depending on the the consumable between

412
00:17:28,860 --> 00:17:27,110
four and six months so if something

413
00:17:30,870 --> 00:17:28,870

happened to SpaceX we'd have to

414
00:17:33,690 --> 00:17:30,880
you know figure out where we were and

415
00:17:35,690 --> 00:17:33,700
how quickly they could return to flight

416
00:17:38,970 --> 00:17:35,700
and then we would we would react

417
00:17:40,770 --> 00:17:38,980
accordingly but you know without your

418
00:17:44,370 --> 00:17:40,780
supply ships you can't go on

419
00:17:46,680 --> 00:17:44,380
indefinitely on orbit could you keep six

420
00:17:48,990 --> 00:17:46,690
people on board if you lost uh if SpaceX

421
00:17:50,850 --> 00:17:49,000
went down for any period of time depends

422
00:17:53,700 --> 00:17:50,860
on the period of time so we will attempt

423
00:17:55,830 --> 00:17:53,710
to keep the crew the crew has enough

424
00:17:57,299 --> 00:17:55,840
supplies including research to continue

425
00:17:59,610 --> 00:17:57,309
to work for somewhere between four and

426
00:18:01,290 --> 00:17:59,620
six months depending on what we did so

427
00:18:04,230 --> 00:18:01,300
the decision we'd have to make is how

428
00:18:07,590 --> 00:18:04,240
how quickly can can SpaceX

429
00:18:09,210 --> 00:18:07,600
get back up and then what can we do with

430
00:18:10,650 --> 00:18:09,220
our Russian colleagues with coordinating

431
00:18:13,020 --> 00:18:10,660
support they might supply which we'll

432
00:18:14,910 --> 00:18:13,030
talk to them about and then we'd have to

433
00:18:16,830 --> 00:18:14,920
look together about okay what's the

434
00:18:19,020 --> 00:18:16,840
right steps to take do we go ahead and

435
00:18:21,299 --> 00:18:19,030
let everybody go home until we're ready

436
00:18:25,020 --> 00:18:21,309
to resupply again or do we step down to

437
00:18:26,760 --> 00:18:25,030
three crew and and I suspect that's what

438
00:18:29,850 --> 00:18:26,770

we would do if we had to is we'd step

439
00:18:33,060 --> 00:18:29,860
down the three crew first but you know

440
00:18:35,610 --> 00:18:33,070
that the way we manage station is not to

441
00:18:37,410 --> 00:18:35,620
have to make those decisions immediately

442
00:18:38,640 --> 00:18:37,420
so we have quite a bit of resources on

443
00:18:40,290 --> 00:18:38,650
board we have quite a bit of time to

444
00:18:41,310 --> 00:18:40,300
work to the problem there's any number

445
00:18:43,110 --> 00:18:41,320
of problems that can be covered

446
00:18:45,660 --> 00:18:43,120
recovered from pretty quickly in flow

447
00:18:47,100 --> 00:18:45,670
and get right back to flight and then

448
00:18:48,810 --> 00:18:47,110
we'd spend a lot of time with SpaceX

449
00:18:51,120 --> 00:18:48,820
about priorities and things like that so

450
00:18:57,380 --> 00:18:51,130
there's you could work a number of

451
00:19:00,660 --> 00:18:57,390
scenarios and we have been madu next and

452
00:19:02,940 --> 00:19:00,670
and some of them you can stay on orbit

453
00:19:04,680 --> 00:19:02,950
for a while and others you may not be

454
00:19:06,330 --> 00:19:04,690
able to but in all cases we have plenty

455
00:19:07,560 --> 00:19:06,340
of time to decide what to do next figure

456
00:19:09,900 --> 00:19:07,570
out what we're really dealing with and

457
00:19:10,610 --> 00:19:09,910
then figure out how we want to react to

458
00:19:17,520 --> 00:19:10,620
it

459
00:19:18,960 --> 00:19:17,530
questions for Holmes um the first is can

460
00:19:20,970 --> 00:19:18,970
you just tell us what happened with the

461
00:19:24,240 --> 00:19:20,980
hot fire test last month that didn't

462
00:19:28,590 --> 00:19:24,250
work and also um considering that you

463
00:19:32,520 --> 00:19:28,600

SpaceX has already done two soft lands

464
00:19:35,250 --> 00:19:32,530
on water what is the challenge this time

465
00:19:37,410 --> 00:19:35,260
why why aren't you guys kind of

466
00:19:37,830 --> 00:19:37,420
expressing more confidence that this

467
00:19:41,430 --> 00:19:37,840
will work

468
00:19:42,890 --> 00:19:41,440
thanks yeah so the static fire the

469
00:19:45,750 --> 00:19:42,900
static fire was attached

470
00:19:48,300 --> 00:19:45,760
it we expected to be a little bit longer

471
00:19:49,970 --> 00:19:48,310
usually and that there are balls on the

472
00:19:53,940 --> 00:19:49,980
vehicle we clipped one of them

473
00:19:57,840 --> 00:19:53,950
it's we looked at the data and we were

474
00:20:01,260 --> 00:19:57,850
on the fence we decided just be cautious

475
00:20:03,690 --> 00:20:01,270
and repeat the static fire so that's

476
00:20:05,670 --> 00:20:03,700
what happened then I want to say on the

477
00:20:08,670 --> 00:20:05,680
19th a couple days later and by that

478
00:20:11,190 --> 00:20:08,680
time we pretty much boxed ourselves

479
00:20:16,170 --> 00:20:11,200
against Christmas and holiday season and

480
00:20:18,350 --> 00:20:16,180
so we decided to - I guess stand down

481
00:20:22,320 --> 00:20:18,360
and move everything into the next year

482
00:20:26,700 --> 00:20:22,330
personally I mean I came here a couple

483
00:20:29,430 --> 00:20:26,710
days ago the team is rested super you

484
00:20:31,470 --> 00:20:29,440
know sharp and and fresh to go and and I

485
00:20:35,280 --> 00:20:31,480
really think this was was a good move

486
00:20:36,810 --> 00:20:35,290
- to repeat the static fire and and give

487
00:20:40,440 --> 00:20:36,820
everybody a break before we continue

488
00:20:44,990 --> 00:20:40,450

with a rather busy on schedule for this

489
00:20:48,570 --> 00:20:45,000
year so I feel it was the right decision

490
00:20:51,720 --> 00:20:48,580
the second question was the how what's

491
00:20:53,550 --> 00:20:51,730
the difference yeah so in the past we

492
00:20:56,400 --> 00:20:53,560
lend we pretend that the ocean is a

493
00:20:58,140 --> 00:20:56,410
landing pad basically and landed soft on

494
00:21:00,930 --> 00:20:58,150
the end you write those landings were

495
00:21:03,750 --> 00:21:00,940
actually very successful they worked

496
00:21:08,330 --> 00:21:03,760
really nice there's obviously the ocean

497
00:21:11,820 --> 00:21:08,340
is not a platform and so so it didn't so

498
00:21:13,980 --> 00:21:11,830
we the fundamental difference is the

499
00:21:16,080 --> 00:21:13,990
limited size I think of the autonomous

500
00:21:20,490 --> 00:21:16,090
space but your own ship it's a it's very

501
00:21:24,390 --> 00:21:20,500
difficult to to to hit a platform of

502
00:21:26,370 --> 00:21:24,400
that size basically and when you look at

503
00:21:29,100 --> 00:21:26,380
it on the ground I think it's it's

504
00:21:30,990 --> 00:21:29,110
probably a very very big platform of big

505
00:21:37,080 --> 00:21:31,000
spaceport but if you look at it from I

506
00:21:39,870 --> 00:21:37,090
think almost 150 or so miles up in in in

507
00:21:42,930 --> 00:21:39,880
in sub orbit then it looks like a very

508
00:21:46,320 --> 00:21:42,940
very small place to land on so I think

509
00:21:50,150 --> 00:21:46,330
they'll tell the position accuracy of

510
00:21:54,060 --> 00:21:50,160
that is just them the primary challenge

511
00:21:56,520 --> 00:21:54,070
in general there's not a lot of room to

512
00:21:58,410 --> 00:21:56,530
maneuver everything has to be really

513
00:22:00,420 --> 00:21:58,420

fine and that's why I really really

514
00:22:02,280 --> 00:22:00,430
cautious I want to also point out I mean

515
00:22:05,040 --> 00:22:02,290
the focus clearly is on the main mission

516
00:22:09,330 --> 00:22:05,050
here cs5 cargo to the station

517
00:22:12,290 --> 00:22:09,340
and and so that's why we're very

518
00:22:19,590 --> 00:22:12,300
cautious and in terms of stage one

519
00:22:21,330 --> 00:22:19,600
landing success Jim Siegel I'm with the

520
00:22:24,510 --> 00:22:21,340
celebration news I have two questions

521
00:22:26,820 --> 00:22:24,520
one first for Mike Mikey and your

522
00:22:28,770 --> 00:22:26,830
opening comment you made a comment about

523
00:22:32,220 --> 00:22:28,780
the fact that the SpaceX will be

524
00:22:36,660 --> 00:22:32,230
delivering much-needed cargo and I was

525
00:22:39,240 --> 00:22:36,670
curious about what in particular is is

526
00:22:41,910 --> 00:22:39,250
needed at this point up at the space

527
00:22:44,520 --> 00:22:41,920
station is that food is that water is

528
00:22:47,610 --> 00:22:44,530
that other kinds of things that the

529
00:22:48,210 --> 00:22:47,620
equipment what would be most needed at

530
00:22:51,710 --> 00:22:48,220
this point

531
00:22:54,480 --> 00:22:51,720
well memory supply assumed that we had

532
00:22:57,240 --> 00:22:54,490
another vehicle with about two and a

533
00:22:59,190 --> 00:22:57,250
half metric tons and so as I said

534
00:23:02,880 --> 00:22:59,200
earlier we were building up to about a

535
00:23:04,950 --> 00:23:02,890
six month supply and and so now we've

536
00:23:06,960 --> 00:23:04,960
consumed some more food before we

537
00:23:09,330 --> 00:23:06,970
started adding so we're starting to

538
00:23:10,950 --> 00:23:09,340

erode into the four month that we don't

539
00:23:12,870 --> 00:23:10,960
want to erode into so that was part of

540
00:23:15,480 --> 00:23:12,880
it is to keep the consumables at a

541
00:23:17,580 --> 00:23:15,490
healthy level to give us wiggle room if

542
00:23:19,950 --> 00:23:17,590
should we need it the other is some

543
00:23:22,260 --> 00:23:19,960
spare parts oh we lost a few spare parts

544
00:23:24,870 --> 00:23:22,270
some of which we can't replace quickly

545
00:23:26,970 --> 00:23:24,880
and so we're we're finishing them up

546
00:23:28,890 --> 00:23:26,980
apply them on future flights and some of

547
00:23:31,830 --> 00:23:28,900
which we were able to get ready and get

548
00:23:32,760 --> 00:23:31,840
get on this flight and particularly we

549
00:23:34,080 --> 00:23:32,770
want to make sure we had all the

550
00:23:36,300 --> 00:23:34,090
hardware we needed on board for these

551
00:23:39,030 --> 00:23:36,310
EVs coming up as we start the first

552
00:23:43,260 --> 00:23:39,040
steps in reconfiguring the vehicle for

553
00:23:44,610 --> 00:23:43,270
for docking and Hans regarding the

554
00:23:48,060 --> 00:23:44,620
experiment that you were telling us

555
00:23:50,850 --> 00:23:48,070
about I presume that the idea here is to

556
00:23:54,180 --> 00:23:50,860
try to figure out how to be able to

557
00:23:58,290 --> 00:23:54,190
reuse the rocket since in the stage one

558
00:24:00,150 --> 00:23:58,300
and so on and this is an experiment I

559
00:24:03,000 --> 00:24:00,160
understand that so we're not going to we

560
00:24:04,950 --> 00:24:03,010
don't think that this is going to be

561
00:24:09,600 --> 00:24:04,960
very important aspect of this mission

562
00:24:10,050 --> 00:24:09,610
but on the other hand how important is

563
00:24:18,690 --> 00:24:10,060

the

564
00:24:21,450 --> 00:24:18,700
SpaceX's long-term strategy and trying

565
00:24:23,420 --> 00:24:21,460
to keep costs down yeah I think it's at

566
00:24:26,010 --> 00:24:23,430
the keyboard the keyboard is long-term

567
00:24:27,660 --> 00:24:26,020
obviously if you if you were to fly and

568
00:24:29,460 --> 00:24:27,670
throw the airplane away after every

569
00:24:33,120 --> 00:24:29,470
every trip you take it's going to be

570
00:24:36,270 --> 00:24:33,130
expensive and so if you carry this over

571
00:24:39,420 --> 00:24:36,280
to Rockets if you're able to reuse parts

572
00:24:42,960 --> 00:24:39,430
of the rocket first stage really and the

573
00:24:45,630 --> 00:24:42,970
key is actually reusability that is easy

574
00:24:48,060 --> 00:24:45,640
it does not involve taking the rocket

575
00:24:49,590 --> 00:24:48,070
apart and and replacing a lot of parts

576
00:24:51,210 --> 00:24:49,600
here and there and putting new engines

577
00:24:53,310 --> 00:24:51,220
on by that time you lost already

578
00:24:55,380 --> 00:24:53,320
basically but I think if you have

579
00:24:57,750 --> 00:24:55,390
reusability that you know even just

580
00:25:00,960 --> 00:24:57,760
limited for a number of flights that is

581
00:25:04,350 --> 00:25:00,970
in the airplane you know type category

582
00:25:06,870 --> 00:25:04,360
you inspect it that that is the long

583
00:25:11,520 --> 00:25:06,880
term vision I think that that largely

584
00:25:13,350 --> 00:25:11,530
alone drives into SpaceX and and and

585
00:25:17,160 --> 00:25:13,360
honestly you know if you if you if you

586
00:25:20,160 --> 00:25:17,170
do imagine that you can fly the stage 50

587
00:25:21,960 --> 00:25:20,170
times there will be that we costs

588
00:25:24,390 --> 00:25:21,970

associated with with recovering the

589
00:25:26,850 --> 00:25:24,400
stage but that's that is really the way

590
00:25:30,780 --> 00:25:26,860
to go and all that you get get cost on

591
00:25:32,700 --> 00:25:30,790
on launches down and yes we try

592
00:25:35,160 --> 00:25:32,710
something different in the past there's

593
00:25:39,510 --> 00:25:35,170
been different methods to to achieve

594
00:25:41,340 --> 00:25:39,520
reusability or landing so I feel like

595
00:25:44,310 --> 00:25:41,350
this is just another and another route

596
00:25:46,770 --> 00:25:44,320
that might actually it looked very it

597
00:25:51,390 --> 00:25:46,780
looks very promising actually I'm I'm

598
00:25:53,160 --> 00:25:51,400
gonna be super excited if this works but

599
00:25:55,860 --> 00:25:53,170
at the same time you know I I don't know

600
00:25:58,620 --> 00:25:55,870
distract from from you know the main

601
00:26:01,470 --> 00:25:58,630
mission I understand it's very important

602
00:26:04,020 --> 00:26:01,480
to get get cs5 into orbit actually much

603
00:26:06,260 --> 00:26:04,030
more important right now and we work on

604
00:26:10,980 --> 00:26:06,270
this long term goal you know

605
00:26:12,840 --> 00:26:10,990
continuously take a question over here

606
00:26:15,540 --> 00:26:12,850
then we're going to take questions from

607
00:26:17,850 --> 00:26:15,550
alan Boyle and James Dean before we

608
00:26:20,040 --> 00:26:17,860
check in with Jason Townsend who's been

609
00:26:21,720 --> 00:26:20,050
monitoring the hashtag ask NASA and

610
00:26:22,760 --> 00:26:21,730
after that we'll go to the phone bridge

611
00:26:24,620 --> 00:26:22,770
and then come back here

612
00:26:26,810 --> 00:26:24,630
questions hi there I'm Ian Bragg with

613
00:26:28,130 --> 00:26:26,820

NASA social questions for Hans curious

614
00:26:30,080 --> 00:26:28,140
what the control burns landing on the

615
00:26:31,670 --> 00:26:30,090
autonomous spaceport drone ship are

616
00:26:34,250 --> 00:26:31,680
using a significant amount of additional

617
00:26:35,570 --> 00:26:34,260
fuel and if so odds it's adding a lot

618
00:26:37,190 --> 00:26:35,580
more weight to the rocket and how is

619
00:26:40,070 --> 00:26:37,200
that different from previous launches

620
00:26:42,650 --> 00:26:40,080
you've done it's actually it's actually

621
00:26:45,140 --> 00:26:42,660
not that different from the other the

622
00:26:47,150 --> 00:26:45,150
simulated landings on the on the surface

623
00:26:49,910 --> 00:26:47,160
so it's very close it does use

624
00:26:52,210 --> 00:26:49,920
additional fuel on the overall sense you

625
00:26:55,010 --> 00:26:52,220
got to keep some fuel in the first stage

626
00:26:57,380 --> 00:26:55,020
for that maneuver but it's actually not

627
00:26:59,060 --> 00:26:57,390
that much and the there are some

628
00:27:01,880 --> 00:26:59,070
benefits you have the shake is largely

629
00:27:05,150 --> 00:27:01,890
empty so it's light after the the main

630
00:27:06,830 --> 00:27:05,160
burn after the ascent burn and we

631
00:27:10,820 --> 00:27:06,840
actually when we land we only have one

632
00:27:12,890 --> 00:27:10,830
engine on so so it's it's somewhat

633
00:27:15,440 --> 00:27:12,900
favorable in that case that the stage is

634
00:27:17,180 --> 00:27:15,450
actually it's a big structure there's no

635
00:27:19,400 --> 00:27:17,190
question it's a it's a pretty big

636
00:27:25,460 --> 00:27:19,410
structure but overall it is actually

637
00:27:27,620 --> 00:27:25,470
very light Ellen hi Hans I just wanted

638
00:27:31,310 --> 00:27:27,630

to kind of fill in some of the gaps that

639
00:27:34,280 --> 00:27:31,320
I had is there an abort sequences there

640
00:27:35,720 --> 00:27:34,290
in scenario where you would say let's do

641
00:27:37,670 --> 00:27:35,730
something different from the rocket or

642
00:27:39,230 --> 00:27:37,680
maybe let's tweak the rocket instead of

643
00:27:42,250 --> 00:27:39,240
trying to pull off the experiment and

644
00:27:44,540 --> 00:27:42,260
then is there going to be a real-time

645
00:27:47,210 --> 00:27:44,550
determination of how successful it was

646
00:27:49,010 --> 00:27:47,220
or do you need to wait for the videotape

647
00:27:51,250 --> 00:27:49,020
I don't understand the first part of

648
00:27:54,980 --> 00:27:51,260
your question and you this first part is

649
00:27:58,250 --> 00:27:54,990
you have the the first stage separation

650
00:28:00,110 --> 00:27:58,260
and then is there any scenario where you

651
00:28:02,810 --> 00:28:00,120
say we're not going to do the boost back

652
00:28:08,720 --> 00:28:02,820
it's automatic it's it's on sequence

653
00:28:11,360 --> 00:28:08,730
basically the the rocket goes its way so

654
00:28:13,850 --> 00:28:11,370
to speak it there there are decision

655
00:28:16,070 --> 00:28:13,860
points but the the rocket will nominally

656
00:28:18,800 --> 00:28:16,080
go through a timeline and perform the

657
00:28:24,020 --> 00:28:18,810
burns and maneuvers that that pointed to

658
00:28:26,060 --> 00:28:24,030
the autonomous space motor ownership so

659
00:28:31,220 --> 00:28:26,070
there's no decision there unless of

660
00:28:35,200 --> 00:28:31,230
Nvidia that's and the second the second

661
00:28:37,420 --> 00:28:35,210
question is well you know in real time

662
00:28:39,910 --> 00:28:37,430
worked I don't want to promise that

663
00:28:42,370 --> 00:28:39,920

frankly and the reason I want is because

664
00:28:46,240 --> 00:28:42,380
it depends on on Internet connectivity

665
00:28:49,210 --> 00:28:46,250
to satellite and and links that we don't

666
00:28:53,020 --> 00:28:49,220
always control and we've seen them work

667
00:28:55,060 --> 00:28:53,030
mostly but sometimes not so and we

668
00:28:57,610 --> 00:28:55,070
should we should know I have some

669
00:29:01,260 --> 00:28:57,620
indication but I really don't don't want

670
00:29:04,330 --> 00:29:01,270
to promise that the if you just rely on

671
00:29:08,800 --> 00:29:04,340
arranged assets here basically receiving

672
00:29:10,990 --> 00:29:08,810
antennas no you can see it from here it

673
00:29:12,160 --> 00:29:11,000
does work what happens to that stage how

674
00:29:18,670 --> 00:29:12,170
is it brought it's gonna be a huge

675
00:29:20,920 --> 00:29:18,680
celebration the stage will be brought

676
00:29:23,380 --> 00:29:20,930
back to port and and thoroughly

677
00:29:26,500 --> 00:29:23,390
inspected obviously that that a lot of

678
00:29:29,320 --> 00:29:26,510
lot of our future decisions depend on

679
00:29:31,930 --> 00:29:29,330
how well that stage comes back if

680
00:29:34,240 --> 00:29:31,940
there's any damage and how we could

681
00:29:38,620 --> 00:29:34,250
improve thermal protection and stuff

682
00:29:41,110 --> 00:29:38,630
like that yeah it will stay it will stay

683
00:29:46,810 --> 00:29:41,120
on the and the autonomous space pod tone

684
00:29:49,270 --> 00:29:46,820
ship James James Dean flora today Hans

685
00:29:51,280 --> 00:29:49,280
apologies but continuing on this theme

686
00:29:54,220 --> 00:29:51,290
with just some some additional

687
00:29:56,100 --> 00:29:54,230
clarifications disregarding the the

688
00:29:58,270 --> 00:29:56,110

differences in this one verse previous

689
00:30:00,670 --> 00:29:58,280
attempts or soft landings you know you

690
00:30:02,740 --> 00:30:00,680
have added some made some changes to the

691
00:30:05,800 --> 00:30:02,750
the booster with the fins right I just

692
00:30:07,270 --> 00:30:05,810
wondered you know how much of a

693
00:30:10,900 --> 00:30:07,280
difference do you expect that to be I

694
00:30:15,820 --> 00:30:10,910
mean 5050 odds actually sounded pretty

695
00:30:18,250 --> 00:30:15,830
good to me for this first time you

696
00:30:21,340 --> 00:30:18,260
referenced the may I'll just start there

697
00:30:22,930 --> 00:30:21,350
if I can yeah so you're right we added

698
00:30:24,340 --> 00:30:22,940
we added good fins to the vehicle

699
00:30:28,900 --> 00:30:24,350
they're visible on the outside and they

700
00:30:32,050 --> 00:30:28,910
fold out I guess like five minutes

701
00:30:35,770 --> 00:30:32,060
roughly into flight the the grid fins

702
00:30:39,700 --> 00:30:35,780
give us more range on the on the down

703
00:30:41,710 --> 00:30:39,710
part of the the trajectory and and they

704
00:30:44,050 --> 00:30:41,720
allow us to keep the vehicle stable so

705
00:30:47,190 --> 00:30:44,060
they save poor parent which we obviously

706
00:30:49,770 --> 00:30:47,200
need for the landing itself so

707
00:30:52,320 --> 00:30:49,780
so that is obviously one part of the

708
00:30:54,780 --> 00:30:52,330
uncertainty that we have we've done if

709
00:30:57,390 --> 00:30:54,790
done analysis we can test but ultimately

710
00:30:59,760 --> 00:30:57,400
you need to fly test to verify how

711
00:31:02,220 --> 00:30:59,770
effective are those fins how well do

712
00:31:04,380 --> 00:31:02,230
their work do they maintain stability in

713
00:31:07,110 --> 00:31:04,390

terms of roll pitch and yaw on the

714
00:31:10,890 --> 00:31:07,120
vehicle and all these things it is an

715
00:31:14,760 --> 00:31:10,900
experiment to some extent 50 percent and

716
00:31:16,350 --> 00:31:14,770
now it's so suddenly for for the type of

717
00:31:20,010 --> 00:31:16,360
experiment I would agree with you it's

718
00:31:23,570 --> 00:31:20,020
actually not too bad but then obviously

719
00:31:32,280 --> 00:31:23,580
the main mission is so so much more and

720
00:31:34,950 --> 00:31:32,290
I ability competed pales against that so

721
00:31:37,980 --> 00:31:34,960
you reference the stability of the

722
00:31:40,080 --> 00:31:37,990
autonomous drone ship and the lightness

723
00:31:42,150 --> 00:31:40,090
of the booster actually I meant

724
00:31:44,640 --> 00:31:42,160
stability on the on the on the first

725
00:31:47,910 --> 00:31:44,650
stage itself I'm sorry I'm sorry mostly

726
00:31:51,750 --> 00:31:47,920
mostly in terms of roll pitch and yaw on

727
00:31:53,280 --> 00:31:51,760
the on the on the stage one itself it's

728
00:31:55,110 --> 00:31:53,290
only this is only for the way back

729
00:31:56,790 --> 00:31:55,120
basically it's not for the way for the

730
00:31:59,730 --> 00:31:56,800
way up for the ascent part nothing

731
00:32:02,790 --> 00:31:59,740
changed this will look like the last

732
00:32:05,100 --> 00:32:02,800
launch the the ship itself just in

733
00:32:06,510 --> 00:32:05,110
reference to waves and so forth you

734
00:32:08,010 --> 00:32:06,520
mentioned it's pretty stable

735
00:32:10,320 --> 00:32:08,020
yeah the stage is pretty light if you

736
00:32:12,000 --> 00:32:10,330
stick the landing yes I mean will the

737
00:32:14,580 --> 00:32:12,010
booster literally just stand there or

738
00:32:18,600 --> 00:32:14,590

could it be blown over by a gust of wind

739
00:32:20,190 --> 00:32:18,610
or also curious if if you had a hard

740
00:32:28,320 --> 00:32:20,200
landing rather than a soft landing would

741
00:32:33,410 --> 00:32:28,330
that be bad for ya it's which would it

742
00:32:39,720 --> 00:32:37,140
yeah Lenny has to be perfect in order to

743
00:32:43,500 --> 00:32:39,730
actually just stand there and and be

744
00:32:46,650 --> 00:32:43,510
safe on the ship the shape is pretty big

745
00:32:49,020 --> 00:32:46,660
so I don't expect waves unless they're

746
00:32:52,020 --> 00:32:49,030
really large to have any impact on the

747
00:32:55,170 --> 00:32:52,030
vehicle we our analysis indicates the

748
00:32:56,850 --> 00:32:55,180
the first stage will stand securely it

749
00:32:59,670 --> 00:32:56,860
will then go actually when it lands it

750
00:33:03,240 --> 00:32:59,680
goes to a saving sequence the

751
00:33:05,700 --> 00:33:03,250
the boat nearby that will get closer

752
00:33:07,770 --> 00:33:05,710
than has control of the stage so they

753
00:33:11,130 --> 00:33:07,780
can bent the stage they can verify the

754
00:33:14,310 --> 00:33:11,140
stage is safe to go everything has been

755
00:33:16,230 --> 00:33:14,320
saved and so we have a operational

756
00:33:18,480 --> 00:33:16,240
concept of operations basically how to

757
00:33:20,880 --> 00:33:18,490
secure the stage then on the boat and

758
00:33:23,270 --> 00:33:20,890
and tie it down and make sure that on

759
00:33:27,540 --> 00:33:23,280
the trip back to port nothing happens

760
00:33:30,120 --> 00:33:27,550
and lastly I know a lot depends on

761
00:33:32,850 --> 00:33:30,130
exactly what happens but based on

762
00:33:35,340 --> 00:33:32,860
whatever plan you have nominally or sort

763
00:33:37,799 --> 00:33:35,350

of optimistically how many times you

764
00:33:40,260 --> 00:33:37,809
expect to you know if you're able to

765
00:33:42,570 --> 00:33:40,270
pull off the landing mm-hmm whenever

766
00:33:43,980 --> 00:33:42,580
that is how often do you expect to try

767
00:33:48,419 --> 00:33:43,990
to do that before you might be ready to

768
00:33:50,040 --> 00:33:48,429
move to a landing on land you know this

769
00:33:52,130 --> 00:33:50,050
actually depends partly on the manifest

770
00:33:55,320 --> 00:33:52,140
there might be situations where the

771
00:33:57,060 --> 00:33:55,330
where the drone ship landing is more

772
00:33:58,860 --> 00:33:57,070
favorable in terms of propellant and

773
00:34:00,720 --> 00:33:58,870
there might be other situations where it

774
00:34:05,040 --> 00:34:00,730
might be favorable or possible to get

775
00:34:08,610 --> 00:34:05,050
back to land so it really depends on the

776
00:34:13,350 --> 00:34:08,620
other mission itself if I recall

777
00:34:16,500 --> 00:34:13,360
correctly that drone ship will be active

778
00:34:18,720 --> 00:34:16,510
for the next couple launches then range

779
00:34:20,399 --> 00:34:18,730
safety have you committed to trying a

780
00:34:23,820 --> 00:34:20,409
certain number of times to before the

781
00:34:25,740 --> 00:34:23,830
nodes come back to land no no I mean

782
00:34:29,250 --> 00:34:25,750
it's it's it's certainly safer um the

783
00:34:31,350 --> 00:34:29,260
way we do it right now and range safety

784
00:34:33,780 --> 00:34:31,360
is pretty happy about that too

785
00:34:37,530 --> 00:34:33,790
so it's a good it's a good it's a good

786
00:34:39,690 --> 00:34:37,540
test before you get back to land okay

787
00:34:42,510 --> 00:34:39,700
Jason Townsend has been monitoring

788
00:34:44,550 --> 00:34:42,520

social media questions for people who

789
00:34:46,889 --> 00:34:44,560
are watching online and using the

790
00:34:48,869 --> 00:34:46,899
hashtag ask NASA Jason do you have any

791
00:34:50,520 --> 00:34:48,879
any questions for us indeed there's

792
00:34:52,290 --> 00:34:50,530
actually several here this first one

793
00:34:54,930 --> 00:34:52,300
comes from Twitter user Anthony who's

794
00:34:56,520 --> 00:34:54,940
asking this is for Hans here if the

795
00:34:59,120 --> 00:34:56,530
first-stage landing is successful how

796
00:35:01,590 --> 00:34:59,130
long will it be before we see video and

797
00:35:05,520 --> 00:35:01,600
dovetailing with that philip asks when

798
00:35:08,010 --> 00:35:05,530
will will we know the result live so the

799
00:35:12,030 --> 00:35:08,020
second question results live probably

800
00:35:18,030 --> 00:35:15,180
if we know the control then I'm pretty

801
00:35:20,610 --> 00:35:18,040
sure it's gonna be out pretty soon yeah

802
00:35:25,920 --> 00:35:20,620
but we might be you might not know it

803
00:35:28,770 --> 00:35:25,930
immediately and in terms of video I want

804
00:35:30,810 --> 00:35:28,780
to say if it goes well by the end of the

805
00:35:32,310 --> 00:35:30,820
day maybe something like that it takes

806
00:35:34,470 --> 00:35:32,320
it takes a cut it takes a while to

807
00:35:36,990 --> 00:35:34,480
transmit the video back and and that's

808
00:35:41,970 --> 00:35:37,000
another thing where the link has to work

809
00:35:45,570 --> 00:35:41,980
so it might be a couple hours they there

810
00:35:51,240 --> 00:35:45,580
too we work as hard as we can to get

811
00:35:53,160 --> 00:35:51,250
this done but uh wonderful next question

812
00:35:55,530 --> 00:35:53,170
here is for is from a Twitter user

813
00:35:57,510 --> 00:35:55,540

Douglas who asks what a single engine

814
00:35:59,520 --> 00:35:57,520
failure prevent the first stage recovery

815
00:36:03,810 --> 00:35:59,530
even if you could push dravite dragon

816
00:36:05,430 --> 00:36:03,820
onto orbit it depends so um

817
00:36:06,930 --> 00:36:05,440
it depends on the engine that fails if

818
00:36:11,490 --> 00:36:06,940
it happens to be the engine we need for

819
00:36:14,070 --> 00:36:11,500
landing I believe that I did want to

820
00:36:15,900 --> 00:36:14,080
point out that actually has they would

821
00:36:17,940 --> 00:36:15,910
probably have no bearing at all for

822
00:36:21,600 --> 00:36:17,950
photo Ragan if he if he loses the

823
00:36:24,480 --> 00:36:21,610
landing engine we need for the for the

824
00:36:27,600 --> 00:36:24,490
for the stage landing sequence we need

825
00:36:32,700 --> 00:36:27,610
three three specific engines currently

826
00:36:33,960 --> 00:36:32,710
if one of those engines would fail at

827
00:36:35,880 --> 00:36:33,970
the center engine would fail that would

828
00:36:38,010 --> 00:36:35,890
certainly be a problem but I'm not sure

829
00:36:42,090 --> 00:36:38,020
about the other two that might you might

830
00:36:45,779 --> 00:36:42,100
be able to pull this off anyways the

831
00:36:49,900 --> 00:36:48,279
this next question comes from a Twitter

832
00:36:52,089 --> 00:36:49,910
user Anthony who asked at what altitude

833
00:36:58,059 --> 00:36:52,099
and speed do you expect the grid fins to

834
00:36:59,499 --> 00:36:58,069
deploy they deploy og I know the time I

835
00:37:01,359 --> 00:36:59,509
looked at the time but I really didn't

836
00:37:04,150 --> 00:37:01,369
check the altitude it's it's way out in

837
00:37:09,279 --> 00:37:04,160
the outside the atmosphere so it's

838
00:37:12,339 --> 00:37:09,289

before we enter wonderful next question

839
00:37:13,900 --> 00:37:12,349
comes from John on Twitter who asks did

840
00:37:15,579 --> 00:37:13,910
the drone ship move to the landing zone

841
00:37:17,259 --> 00:37:15,589
on its own

842
00:37:18,489 --> 00:37:17,269
was there a crew on board the drone ship

843
00:37:22,480 --> 00:37:18,499
while it was moving to the landing zone

844
00:37:24,640 --> 00:37:22,490
I think so well actually I don't know

845
00:37:25,839 --> 00:37:24,650
that should be correct I mean um I I

846
00:37:28,749 --> 00:37:25,849
don't know the details how we got the

847
00:37:32,230 --> 00:37:28,759
drone ship there I know there's another

848
00:37:33,970 --> 00:37:32,240
boat with crew and the drone ship I'm

849
00:37:36,549 --> 00:37:33,980
not sure if there's any quarters on it

850
00:37:39,099 --> 00:37:36,559
or not I don't think so

851
00:37:41,739 --> 00:37:39,109
wonderful and this last question here is

852
00:37:43,569 --> 00:37:41,749
from Brent who asks how do the people at

853
00:37:51,279 --> 00:37:43,579
NASA feel about SpaceX trying to land

854
00:37:53,470 --> 00:37:51,289
the first stage I can't go to me okay

855
00:38:01,749 --> 00:37:53,480
the people at NASA are really interested

856
00:38:04,420 --> 00:38:01,759
in that I I don't know I mean it's

857
00:38:05,979 --> 00:38:04,430
I guess NASA wants to make sure that it

858
00:38:08,049 --> 00:38:05,989
doesn't get attention away from the main

859
00:38:11,680 --> 00:38:08,059
mission I want to say that that's just

860
00:38:14,140 --> 00:38:11,690
and honestly I see that I have the same

861
00:38:17,609 --> 00:38:14,150
same interest I want to make sure that

862
00:38:20,019 --> 00:38:17,619
the Cirrus 5 mission works perfectly and

863
00:38:22,150 --> 00:38:20,029

there's no impact to the mission at all

864
00:38:24,970 --> 00:38:22,160
that's the main thing so Han said it

865
00:38:26,920 --> 00:38:24,980
very well we're extremely interested in

866
00:38:30,370 --> 00:38:26,930
the success of this flight in terms of

867
00:38:33,339 --> 00:38:30,380
getting cargo to ISS but as an agency

868
00:38:35,769 --> 00:38:33,349
we're also extremely proud of our

869
00:38:38,019 --> 00:38:35,779
affiliation with with SpaceX and very

870
00:38:40,329 --> 00:38:38,029
excited about the steps they take to

871
00:38:43,299 --> 00:38:40,339
further Space Flight in general and

872
00:38:45,729 --> 00:38:43,309
reduce the cost of spaceflight so this

873
00:38:49,089 --> 00:38:45,739
exciting time from our perspective as

874
00:38:50,890 --> 00:38:49,099
well okay we're going to go to the phone

875
00:38:53,739 --> 00:38:50,900
bridge now where we have two callers on

876
00:38:55,029 --> 00:38:53,749
hold first let's go to Jason Davis from

877
00:38:58,310 --> 00:38:55,039
the Planetary Society

878
00:39:00,500 --> 00:38:58,320
are you there Jason yeah thank you

879
00:39:03,290 --> 00:39:00,510
this is for Hans again all about the

880
00:39:07,070 --> 00:39:03,300
Bart I wanted to know if you have a

881
00:39:09,290 --> 00:39:07,080
precise landing coordinates for his

882
00:39:12,020 --> 00:39:09,300
barge it looked like it was about 200

883
00:39:14,930 --> 00:39:12,030
miles east of Jacksonville possibly and

884
00:39:16,340 --> 00:39:14,940
then secondly I wanted to see if you'd

885
00:39:19,730 --> 00:39:16,350
be willing to say how much the

886
00:39:21,320 --> 00:39:19,740
autonomous drone cost thank you okay on

887
00:39:26,120 --> 00:39:21,330
the first one the first my question oh

888
00:39:27,010 --> 00:39:26,130

my comment is stay away I really mean

889
00:39:30,200 --> 00:39:27,020
that

890
00:39:32,030 --> 00:39:30,210
and on the second one I don't know the

891
00:39:33,500 --> 00:39:32,040
cost frankly it's actually I want to

892
00:39:36,170 --> 00:39:33,510
point out it's not a barrace barge has

893
00:39:42,680 --> 00:39:36,180
no no propulsion this this vehicle has

894
00:39:44,510 --> 00:39:42,690
trusters and so it's a drone ship okay

895
00:39:46,750 --> 00:39:44,520
still on the phone bridge Michael

896
00:39:50,030 --> 00:39:46,760
Balfour from Popular Mechanics

897
00:39:52,400 --> 00:39:50,040
hi there it's good to be here thank you

898
00:39:55,310 --> 00:39:52,410
for answering these questions about the

899
00:39:56,840 --> 00:39:55,320
drone ship can you give us a rough you

900
00:39:59,030 --> 00:39:56,850
know just how far out it's going to be

901
00:40:01,040 --> 00:39:59,040
from the Florida coast it's not the

902
00:40:02,540 --> 00:40:01,050
actual coordinates and also I wanted to

903
00:40:04,609 --> 00:40:02,550
just verify that you said it was about

904
00:40:06,290 --> 00:40:04,619
nine minutes after launch that it's

905
00:40:08,000 --> 00:40:06,300
supposed to land the first stage will

906
00:40:10,849 --> 00:40:08,010
land on the barge is that I mean on the

907
00:40:13,130 --> 00:40:10,859
drum ship is that right yes that's

908
00:40:14,870 --> 00:40:13,140
correct it's it's the noumenal time line

909
00:40:17,599 --> 00:40:14,880
shuts the engine down right around nine

910
00:40:19,580 --> 00:40:17,609
nine minutes and again that's just just

911
00:40:23,510 --> 00:40:19,590
a little tad before the second stage

912
00:40:26,470 --> 00:40:23,520
shuts down and I on purpose did not look

913
00:40:29,900 --> 00:40:26,480

exactly at the location I know it's a

914
00:40:33,880 --> 00:40:29,910
it's a couple hundred miles out in the

915
00:40:36,320 --> 00:40:33,890
in the ocean to be safe basically but I

916
00:40:40,460 --> 00:40:36,330
don't know the exact the exact location

917
00:40:43,849 --> 00:40:40,470
unfortunately okay back here for

918
00:40:44,810 --> 00:40:43,859
questions Phil I feel heating foxnews

919
00:40:47,450 --> 00:40:44,820
Hans

920
00:40:49,190 --> 00:40:47,460
I'd like to return back to the landing

921
00:40:54,080 --> 00:40:49,200
on the autonomous drone ship if you

922
00:40:56,420 --> 00:40:54,090
don't mind first of all is it sitting in

923
00:40:59,450 --> 00:40:56,430
the spot right now where you're hoping

924
00:41:01,760 --> 00:40:59,460
the rocket lands or is it actually going

925
00:41:05,540 --> 00:41:01,770
to adjust at all tomorrow it picks a

926
00:41:09,590 --> 00:41:05,550
spot and and it holds the spot it holds

927
00:41:11,990 --> 00:41:09,600
it very tightly Elon Musk who said the

928
00:41:14,180 --> 00:41:12,000
whole idea of not trashing the rocket

929
00:41:16,880 --> 00:41:14,190
into the ocean yeah but doing this

930
00:41:20,359 --> 00:41:16,890
reusability like is that you know akin

931
00:41:22,630 --> 00:41:20,369
to not buying a brand-new 747 and

932
00:41:24,890 --> 00:41:22,640
throwing it away after one flight so

933
00:41:28,670 --> 00:41:24,900
ticket into the future where this has

934
00:41:30,560 --> 00:41:28,680
proven successfully what we will be

935
00:41:33,440 --> 00:41:30,570
looking at is the future of space

936
00:41:36,310 --> 00:41:33,450
exploration with rockets that it could

937
00:41:39,740 --> 00:41:36,320
possibly land on the launch pad day of

938
00:41:41,420 --> 00:41:39,750

riri stack and take off again sort of

939
00:41:42,140 --> 00:41:41,430
like a commercial aircraft I mean what

940
00:41:43,790 --> 00:41:42,150
what could it be

941
00:41:46,310 --> 00:41:43,800
that's they think that is the the vision

942
00:41:48,770 --> 00:41:46,320
ultimately to make this more like an

943
00:41:50,900 --> 00:41:48,780
aircraft operation where the stage comes

944
00:41:55,250 --> 00:41:50,910
back gets

945
00:41:56,780 --> 00:41:55,260
minimal service fundamentally if you

946
00:42:00,650 --> 00:41:56,790
look at the aircraft industry which is

947
00:42:02,120 --> 00:42:00,660
extremely a well-oiled machine by now

948
00:42:04,190 --> 00:42:02,130
just simply because they have so many

949
00:42:06,880 --> 00:42:04,200
operations and if you can get the number

950
00:42:09,349 --> 00:42:06,890
of operations up in the space industry

951
00:42:12,230 --> 00:42:09,359
that that basically is our our our

952
00:42:14,720 --> 00:42:12,240
vision our goal to have as many launches

953
00:42:16,280 --> 00:42:14,730
as possible to make sure that we fully

954
00:42:19,910 --> 00:42:16,290
understand what happens on the way up

955
00:42:22,609 --> 00:42:19,920
and down and address whatever needs to

956
00:42:26,120 --> 00:42:22,619
be addressed but not more and basically

957
00:42:27,109 --> 00:42:26,130
drive the cost cost down over long long

958
00:42:30,410 --> 00:42:27,119
range I mean this would have an impact

959
00:42:34,160 --> 00:42:30,420
on the entire industry if you you know

960
00:42:35,510 --> 00:42:34,170
for a moment assume this would be what

961
00:42:37,430 --> 00:42:35,520
you said like one launch per day or

962
00:42:41,240 --> 00:42:37,440
something like that or even more you

963
00:42:43,430 --> 00:42:41,250

will fly spacecraft that could there

964
00:42:46,070 --> 00:42:43,440
wouldn't be that expensive anymore you

965
00:42:50,480 --> 00:42:46,080
would take more risks and you might have

966
00:42:52,880 --> 00:42:50,490
a week of supply on the station so I

967
00:42:54,890 --> 00:42:52,890
think I think if this would work out it

968
00:42:56,030 --> 00:42:54,900
would have a tremendous impact on the on

969
00:42:58,310 --> 00:42:56,040
the industry that I haven't really

970
00:43:01,310 --> 00:42:58,320
thought through personally I'm pretty

971
00:43:04,560 --> 00:43:01,320
sure Elon did so

972
00:43:06,480 --> 00:43:04,570
yeah go ahead Stuart money interspace

973
00:43:09,420 --> 00:43:06,490
net and my question on the same subject

974
00:43:11,790 --> 00:43:09,430
is for Hans two questions actually one

975
00:43:14,100 --> 00:43:11,800
on the return effort will the center

976
00:43:16,730 --> 00:43:14,110
engine be burning continuously or are

977
00:43:20,460 --> 00:43:16,740
there three separate ignition events

978
00:43:21,930 --> 00:43:20,470
it's three separate ignition events okay

979
00:43:25,320 --> 00:43:21,940
so if you can't the assent to it

980
00:43:26,580 --> 00:43:25,330
actually then for I and in the event you

981
00:43:30,300 --> 00:43:26,590
are successful will you be coming back

982
00:43:31,980 --> 00:43:30,310
to Jacksonville or right down Main

983
00:43:39,450 --> 00:43:31,990
Street here into the turning base I

984
00:43:41,010 --> 00:43:39,460
think it's excellent thank you okay hold

985
00:43:45,920 --> 00:43:41,020
off for a second I'll let Jimmy get

986
00:43:52,560 --> 00:43:49,830
Irene Klotz with Reuters for Mike is

987
00:43:54,480 --> 00:43:52,570
there anything specifically that had to

988
00:43:57,360 --> 00:43:54,490

be added on to a dragon after the

989
00:43:59,400 --> 00:43:57,370
problem with the Antares as you

990
00:44:02,130 --> 00:43:59,410
mentioned some spacewalk equipment I

991
00:44:05,250 --> 00:44:02,140
think and for Hans um on another off

992
00:44:07,710 --> 00:44:05,260
topic since you're being very open today

993
00:44:12,180 --> 00:44:07,720
can you give us an update on Falcon

994
00:44:14,790 --> 00:44:12,190
Heavy flight this year and just the

995
00:44:18,210 --> 00:44:14,800
overall SpaceX manifests for the year

996
00:44:21,000 --> 00:44:18,220
Thanks so to answer your question we

997
00:44:24,240 --> 00:44:21,010
made some changes for the life of me

998
00:44:26,580 --> 00:44:24,250
that was before Christmas holiday but I

999
00:44:28,680 --> 00:44:26,590
can get that for you but we did have to

1000
00:44:30,690 --> 00:44:28,690
rearrange the manifest our SpaceX

1001
00:44:33,360 --> 00:44:30,700
friends were very accommodating there

1002
00:44:36,630 --> 00:44:33,370
were some items we we put off there were

1003
00:44:39,690 --> 00:44:36,640
some we took off a what we call a Norris

1004
00:44:41,280 --> 00:44:39,700
tank nitrogen oxygen resupply tank we

1005
00:44:43,680 --> 00:44:41,290
figured out from a logistic standpoint

1006
00:44:46,650 --> 00:44:43,690
we didn't need that tank it was gonna

1007
00:44:48,510 --> 00:44:46,660
fly with oxygen on board and that freed

1008
00:44:50,220 --> 00:44:48,520
up room to bring some other supplies but

1009
00:44:51,540 --> 00:44:50,230
specifically we would put on I forgotten

1010
00:45:03,360 --> 00:44:51,550
now but I can get that for you and

1011
00:45:06,200 --> 00:45:03,370
supply it through these guys okay so the

1012
00:45:09,270 --> 00:45:06,210
manufactures busy on the bright side

1013
00:45:12,300 --> 00:45:09,280

unlike this this will now include more

1014
00:45:13,230 --> 00:45:12,310
launch sites so Vandenberg will be

1015
00:45:17,340 --> 00:45:13,240
they'll be more

1016
00:45:21,090 --> 00:45:17,350
if you will see the the next mission is

1017
00:45:24,590 --> 00:45:21,100
a mission called discover and it's

1018
00:45:29,220 --> 00:45:24,600
actually currently at the end of January

1019
00:45:31,980 --> 00:45:29,230
there will be dragon missions dragon

1020
00:45:32,640 --> 00:45:31,990
crew dragon missions rather like the the

1021
00:45:35,760 --> 00:45:32,650
pad abort

1022
00:45:39,630 --> 00:45:35,770
for example heavy I don't know

1023
00:45:41,190 --> 00:45:39,640
where we are currently and how how

1024
00:45:43,650 --> 00:45:41,200
everything is coming together but I know

1025
00:45:46,020 --> 00:45:43,660
that the significant part of the company

1026
00:45:48,990 --> 00:45:46,030
is working on Falcon Heavy and trying to

1027
00:45:50,730 --> 00:45:49,000
get it out for the first flight but I

1028
00:45:57,090 --> 00:45:50,740
really don't have an update on the on

1029
00:45:58,920 --> 00:45:57,100
the actual launch date associated press

1030
00:46:00,960 --> 00:45:58,930
with two questions quick one for Hans

1031
00:46:03,210 --> 00:46:00,970
what will be the peak altitude of the

1032
00:46:04,590 --> 00:46:03,220
first stage I think you mentioned 150

1033
00:46:05,910 --> 00:46:04,600
miles but I wasn't sure if that's as

1034
00:46:10,680 --> 00:46:05,920
high as it will go and then I had a

1035
00:46:12,500 --> 00:46:10,690
question for Mike I don't that's the

1036
00:46:16,920 --> 00:46:12,510
that's actually usually the altitude

1037
00:46:18,960 --> 00:46:16,930
roughly but and I don't think the burns

1038
00:46:20,550 --> 00:46:18,970

reduce the altitude that much so it's

1039
00:46:22,800 --> 00:46:20,560
probably a little bit lower than what I

1040
00:46:24,410 --> 00:46:22,810
quoted here I had to look up the numbers

1041
00:46:27,540 --> 00:46:24,420
can I can get back to you on that

1042
00:46:30,480 --> 00:46:27,550
thank you and for Mike you mentioned

1043
00:46:32,430 --> 00:46:30,490
that you plan to fly ultimately more

1044
00:46:33,270 --> 00:46:32,440
when your missions and would you

1045
00:46:36,270 --> 00:46:33,280
envision those being

1046
00:46:38,970 --> 00:46:36,280
back-to-back-to-back how many more over

1047
00:46:42,630 --> 00:46:38,980
hum you know how many do you envision

1048
00:46:43,830 --> 00:46:42,640
and do you have a stampede of astronauts

1049
00:46:49,320 --> 00:46:43,840
who are willing to go up there for a

1050
00:46:50,610 --> 00:46:49,330
solid year oh that's a that's a loaded

1051
00:46:53,370 --> 00:46:50,620
question so I'll stay away from the

1052
00:46:57,300 --> 00:46:53,380
Stampede astronauts but the the answer

1053
00:47:00,180 --> 00:46:57,310
question is from a u.s. Life Sciences

1054
00:47:01,650 --> 00:47:00,190
perspective they have come to us and

1055
00:47:05,730 --> 00:47:01,660
said they thought it would be beneficial

1056
00:47:07,290 --> 00:47:05,740
to have 12 one-year subjects we have

1057
00:47:11,730 --> 00:47:07,300
been talking to our partners about when

1058
00:47:13,440 --> 00:47:11,740
the next one could occur but we haven't

1059
00:47:15,620 --> 00:47:13,450
agreed on that yet so by definition

1060
00:47:18,630 --> 00:47:15,630
because of where we are in the cycle of

1061
00:47:21,630 --> 00:47:18,640
selecting crews certainly the next

1062
00:47:24,810 --> 00:47:21,640
flight after Scott and Mikkel return

1063
00:47:26,850 --> 00:47:24,820

home won't be one of those it may very

1064
00:47:28,380 --> 00:47:26,860
well wait all the way until we get

1065
00:47:29,760 --> 00:47:28,390
the Commercial Crew vehicle where we

1066
00:47:31,830 --> 00:47:29,770
have more seats that we could dedicate

1067
00:47:34,260 --> 00:47:31,840
to it but we're trying to decide that

1068
00:47:37,770 --> 00:47:34,270
that very question now but as a

1069
00:47:42,060 --> 00:47:37,780
community even outside the US the life

1070
00:47:44,480 --> 00:47:42,070
scientists folks across the partnership

1071
00:47:46,620 --> 00:47:44,490
agree that more subjects would be good

1072
00:47:48,450 --> 00:47:46,630
they they're trying to get enough

1073
00:47:50,430 --> 00:47:48,460
subjects to know whether or not there is

1074
00:47:52,740 --> 00:47:50,440
whether or not we've reached equilibrium

1075
00:47:54,690 --> 00:47:52,750
at six months or whether there's enough

1076
00:47:59,520 --> 00:47:54,700
changes that tells you you need to do

1077
00:48:03,660 --> 00:47:59,530
more to know if you can go further than

1078
00:48:06,900 --> 00:48:03,670
then then one year on orbit so the the

1079
00:48:08,730 --> 00:48:06,910
whole point of the subjects even though

1080
00:48:11,400 --> 00:48:08,740
statistically speaking twelve isn't a

1081
00:48:14,100 --> 00:48:11,410
huge number it's enough to see if the

1082
00:48:16,290 --> 00:48:14,110
curve is going to change and if you can

1083
00:48:17,400 --> 00:48:16,300
figure out the curves gonna gonna change

1084
00:48:19,850 --> 00:48:17,410
or whether or not you've kind of

1085
00:48:21,960 --> 00:48:19,860
stabilized then you'll feel good about

1086
00:48:25,590 --> 00:48:21,970
decisions you make in the future for how

1087
00:48:29,760 --> 00:48:25,600
many months you can fly based on the

1088
00:48:31,620 --> 00:48:29,770

evidence from station don't just a very

1089
00:48:33,360 --> 00:48:31,630
quick question for Hans how long does

1090
00:48:35,430 --> 00:48:33,370
safing last before the crew can get on

1091
00:48:36,870 --> 00:48:35,440
board the the drone ship and I was

1092
00:48:39,240 --> 00:48:36,880
wondering you know I assume the LOX just

1093
00:48:40,830 --> 00:48:39,250
boils off in vents I wasn't sure about

1094
00:48:42,090 --> 00:48:40,840
the RP one is that whatever residual

1095
00:48:43,710 --> 00:48:42,100
amounts there is it just stay in the

1096
00:48:46,800 --> 00:48:43,720
tank just stays in the tank yeah it's

1097
00:48:50,370 --> 00:48:46,810
like like any other airplane basically

1098
00:48:54,360 --> 00:48:50,380
and that um it set the order of maybe

1099
00:48:57,460 --> 00:48:54,370
one or two hours let's take a question

1100
00:49:02,569 --> 00:49:00,079
my name is Brittany Kraft I'm with the

1101
00:49:05,569 --> 00:49:02,579
NASA social attendees and I was curious

1102
00:49:07,880 --> 00:49:05,579
if SpaceX will be considered at Wallops

1103
00:49:11,180 --> 00:49:07,890
Island after everything gets back up and

1104
00:49:17,779 --> 00:49:11,190
running you mean as a launch site

1105
00:49:19,670 --> 00:49:17,789
yes so we did originally trade launch

1106
00:49:22,880 --> 00:49:19,680
sites and we made the decision at the

1107
00:49:26,599 --> 00:49:22,890
time that we go to the Cape and to

1108
00:49:31,730 --> 00:49:26,609
Vandenberg and have a private launch

1109
00:49:35,390 --> 00:49:31,740
site in Texas so no we're not looking at

1110
00:49:36,890 --> 00:49:35,400
at Wallops at this point in time but

1111
00:49:38,960 --> 00:49:36,900
some go to the phone bridge for a

1112
00:49:43,700 --> 00:49:38,970
follow-up question from Michael Balfour

1113
00:49:45,170 --> 00:49:43,710

from Popular Mechanics Michael I think

1114
00:49:47,420 --> 00:49:45,180
I'm good my questions being answered

1115
00:49:49,700 --> 00:49:47,430
thank you okay you bet how about

1116
00:49:53,210 --> 00:49:49,710
checking back in with Jason Townsend on

1117
00:49:56,900 --> 00:49:53,220
where we are with questions coming in on

1118
00:49:58,730 --> 00:49:56,910
the hashtag ask NASA sure this question

1119
00:50:00,109 --> 00:49:58,740
comes from Twitter user BOE who asked I

1120
00:50:02,690 --> 00:50:00,119
would like to know if there are plans to

1121
00:50:06,829 --> 00:50:02,700
expand the ISS and or remove or replace

1122
00:50:10,190 --> 00:50:06,839
sections let's see our Russian

1123
00:50:13,880 --> 00:50:10,200
colleagues are considering an addition

1124
00:50:15,410 --> 00:50:13,890
of two or three modules that has not

1125
00:50:18,650 --> 00:50:15,420
been finalized but they have been

1126
00:50:21,950 --> 00:50:18,660
talking about adding a power module and

1127
00:50:23,690 --> 00:50:21,960
a laboratory module the Ameland in fact

1128
00:50:28,279 --> 00:50:23,700
was supposed to supply I was supposed to

1129
00:50:32,359 --> 00:50:28,289
fly this year 2015 but it's now pushed

1130
00:50:34,729 --> 00:50:32,369
into late 2017 or maybe later there are

1131
00:50:38,539 --> 00:50:34,739
other opportunities perhaps for four

1132
00:50:42,319 --> 00:50:38,549
modules to come to ISS the big loaf team

1133
00:50:44,029 --> 00:50:42,329
is building a small demonstration module

1134
00:50:46,339 --> 00:50:44,039
inflatable module that will fly to ISS

1135
00:50:50,420 --> 00:50:46,349
it's not meant to stay permanently on

1136
00:50:52,700 --> 00:50:50,430
board but it it is supposed to arrive as

1137
00:50:55,479 --> 00:50:52,710
well on SpaceX eight actually and spend

1138
00:50:59,539 --> 00:50:55,489

some time on the aft port of a node 3

1139
00:51:01,940 --> 00:50:59,549
and and there could be other expiration

1140
00:51:04,549 --> 00:51:01,950
type modules that might need to come to

1141
00:51:07,789 --> 00:51:04,559
ISS for a short period of time for

1142
00:51:09,950 --> 00:51:07,799
demonstration and checkout so the size

1143
00:51:10,250 --> 00:51:09,960
the station is set for the job that has

1144
00:51:12,230 --> 00:51:10,260
to

1145
00:51:15,980 --> 00:51:12,240
but it's possible that modules could

1146
00:51:18,770 --> 00:51:15,990
come based on supporting other other

1147
00:51:20,000 --> 00:51:18,780
research and technology efforts and of

1148
00:51:21,830 --> 00:51:20,010
course as I mentioned our Russian

1149
00:51:25,940 --> 00:51:21,840
colleagues are looking at some potential

1150
00:51:27,470 --> 00:51:25,950
additions as well okay wonderful this

1151
00:51:29,750 --> 00:51:27,480
other question here comes from Twitter

1152
00:51:35,320 --> 00:51:29,760
user Ricky who asks so what exactly are

1153
00:51:43,640 --> 00:51:35,330
you taking up there food fuel fuel no

1154
00:51:48,100 --> 00:51:43,650
food clothing supplies research and an

1155
00:51:50,930 --> 00:51:48,110
exterior experiment for measuring

1156
00:51:53,090 --> 00:51:50,940
aerosols in the atmosphere which is

1157
00:51:56,630 --> 00:51:53,100
actually helps on the study of global

1158
00:52:02,800 --> 00:51:56,640
warming so we continue that's kind of

1159
00:52:06,620 --> 00:52:02,810
the standard fare it's usually about 30%

1160
00:52:15,910 --> 00:52:06,630
cruise supplies and food 30% research

1161
00:52:19,130 --> 00:52:15,920
and the other 30% is spare parts James

1162
00:52:20,480 --> 00:52:19,140
thanks again James Dean flora today Mike

1163
00:52:23,750 --> 00:52:20,490

I was wondering if you could touch on a

1164
00:52:24,650 --> 00:52:23,760
plan to fly Cygnus on Atlas 5 and just

1165
00:52:25,970 --> 00:52:24,660
that being like a different

1166
00:52:27,620 --> 00:52:25,980
configuration that hasn't been

1167
00:52:31,400 --> 00:52:27,630
demonstrated like these other vehicles

1168
00:52:33,770 --> 00:52:31,410
were what were there any issues with

1169
00:52:36,500 --> 00:52:33,780
that or is it just like that you know

1170
00:52:39,320 --> 00:52:36,510
sort of proven rocket flying any other

1171
00:52:41,360 --> 00:52:39,330
payload and and also for either you or

1172
00:52:43,520 --> 00:52:41,370
Hans just wondering you know if SpaceX

1173
00:52:46,940 --> 00:52:43,530
found itself in the exact same position

1174
00:52:50,690 --> 00:52:46,950
would you also look to Atlas 5 to fly a

1175
00:52:52,040 --> 00:52:50,700
dragon so you'd have to get the details

1176
00:52:54,320 --> 00:52:52,050
from orbital but they have some

1177
00:52:56,870 --> 00:52:54,330
experience with the Atlas design and

1178
00:52:59,480 --> 00:52:56,880
flying their bus which is the Cygnus is

1179
00:53:03,620 --> 00:52:59,490
based on a bus that they use throughout

1180
00:53:07,850 --> 00:53:03,630
their satellite fleet and and so that

1181
00:53:10,370 --> 00:53:07,860
gives them great confidence that they

1182
00:53:12,890 --> 00:53:10,380
can fly this spacecraft onboard the

1183
00:53:13,970 --> 00:53:12,900
Atlas of course you have to adapt to it

1184
00:53:15,530 --> 00:53:13,980
and you have to do quite a bit of loads

1185
00:53:17,930 --> 00:53:15,540
analysis to convince yourself you're

1186
00:53:20,060 --> 00:53:17,940
okay so we will look at all that to make

1187
00:53:22,550 --> 00:53:20,070
sure that the environment won't damage

1188
00:53:24,590 --> 00:53:22,560

our hardware all the normal things we do

1189
00:53:27,320 --> 00:53:24,600
to clear a Cygnus

1190
00:53:30,140 --> 00:53:27,330
to approach ISS it's the same spacecraft

1191
00:53:31,640 --> 00:53:30,150
so that normal work will be done and

1192
00:53:34,550 --> 00:53:31,650
that's not different than what we've

1193
00:53:37,400 --> 00:53:34,560
done before the only other thing we'd

1194
00:53:39,890 --> 00:53:37,410
have to look at is the vehicle and how

1195
00:53:41,300 --> 00:53:39,900
the interfaces to the vehicle and

1196
00:53:43,100 --> 00:53:41,310
understand that performance of course

1197
00:53:45,770 --> 00:53:43,110
it's an atlas and there's quite a bit of

1198
00:53:49,760 --> 00:53:45,780
data on the Atlas vehicle itself so in

1199
00:53:50,870 --> 00:53:49,770
that respect it won't be a huge amount

1200
00:53:52,420 --> 00:53:50,880
of work probably the biggest thing that

1201
00:53:54,860 --> 00:53:52,430
has to happen is they have to do all the

1202
00:53:57,140 --> 00:53:54,870
environmental analysis to confirm that

1203
00:53:58,850 --> 00:53:57,150
Cygnus will be okay and to help us know

1204
00:54:00,790 --> 00:53:58,860
that the cargo inside will be fine

1205
00:54:02,720 --> 00:54:00,800
that's probably the biggest Delta for us

1206
00:54:06,680 --> 00:54:02,730
okay we're gonna try to see if we can

1207
00:54:09,260 --> 00:54:06,690
squeeze three more questions in I'm

1208
00:54:10,760 --> 00:54:09,270
Justin Beaupre with NASA social actually

1209
00:54:13,040 --> 00:54:10,770
I have a question regarding the weather

1210
00:54:15,500 --> 00:54:13,050
for the autonomous space board drone

1211
00:54:17,720 --> 00:54:15,510
ship I don't know if you're working

1212
00:54:19,370 --> 00:54:17,730
directly with them but what kind of

1213
00:54:22,010 --> 00:54:19,380

weather might we be seeing as well as

1214
00:54:24,350 --> 00:54:22,020
maybe what type of weather should we be

1215
00:54:24,980 --> 00:54:24,360
worried about maybe that's more towards

1216
00:54:27,020 --> 00:54:24,990
you Hans

1217
00:54:29,210 --> 00:54:27,030
for the restrictions that they might

1218
00:54:36,470 --> 00:54:29,220
have when coming because we're not

1219
00:54:39,500 --> 00:54:36,480
entirely sure what to expect wave height

1220
00:54:40,670 --> 00:54:39,510
forecast looking at wave heights for

1221
00:54:42,890 --> 00:54:40,680
tomorrow morning to be about five to

1222
00:54:44,720 --> 00:54:42,900
seven feet and then behind that front

1223
00:54:47,570 --> 00:54:44,730
and then they'll pick up if we happen to

1224
00:54:49,250 --> 00:54:47,580
slip into Friday then waves will pick up

1225
00:54:50,900 --> 00:54:49,260
on Thursday will be a max of about

1226
00:54:52,880 --> 00:54:50,910
twelve to sixteen feet and then they'll

1227
00:54:56,030 --> 00:54:52,890
back down for a Friday morning to about

1228
00:54:58,280 --> 00:54:56,040
six to eight feet so Hans explained what

1229
00:55:00,530 --> 00:54:58,290
the thresholds are for that so assistant

1230
00:55:03,220 --> 00:55:00,540
you know the the drone ship is pretty

1231
00:55:06,410 --> 00:55:03,230
big and doesn't those those wave heights

1232
00:55:09,230 --> 00:55:06,420
don't have any significant impact on the

1233
00:55:10,580 --> 00:55:09,240
landing and in terms of clouds I don't

1234
00:55:13,250 --> 00:55:10,590
think we have the same imitations that

1235
00:55:14,660 --> 00:55:13,260
we have on the way on the ascent I don't

1236
00:55:17,150 --> 00:55:14,670
think there's a stick cloud rule on the

1237
00:55:23,740 --> 00:55:17,160
way coming down so there's a lot less

1238
00:55:26,630 --> 00:55:23,750

limitations honestly in terms of landing

1239
00:55:28,970 --> 00:55:26,640
okay here on the front row my name is

1240
00:55:31,370 --> 00:55:28,980
Adam Byerly with NASA social and NASA

1241
00:55:32,960 --> 00:55:31,380
pics org I was wondering if you could

1242
00:55:35,330 --> 00:55:32,970
tell us a little bit more about the

1243
00:55:37,310 --> 00:55:35,340
actual process of capturing the dragon

1244
00:55:38,270 --> 00:55:37,320
spaceship to the International Space

1245
00:55:41,120 --> 00:55:38,280
Station

1246
00:55:43,760 --> 00:55:41,130
how long that takes the actual procedure

1247
00:55:49,280 --> 00:55:43,770
and how it may different differ from

1248
00:55:55,250 --> 00:55:49,290
other missions like this mean to you

1249
00:55:58,160 --> 00:55:55,260
okay well I guess it's an arbor I think

1250
00:55:59,870 --> 00:55:58,170
the Army's radio approach in the sense

1251
00:56:03,830 --> 00:55:59,880
that dragon basically creeps up on

1252
00:56:07,010 --> 00:56:03,840
another station over a period of I think

1253
00:56:10,850 --> 00:56:07,020
it's like maybe six seven hours there's

1254
00:56:12,230 --> 00:56:10,860
certain whole ports in there I want to

1255
00:56:16,130 --> 00:56:12,240
say something at the order of you know

1256
00:56:18,170 --> 00:56:16,140
several kilometers out once you enter

1257
00:56:19,520 --> 00:56:18,180
the the key parts here there's going to

1258
00:56:22,100 --> 00:56:19,530
be more whole points at two and a half

1259
00:56:23,810 --> 00:56:22,110
and so on so forth every whole point you

1260
00:56:26,570 --> 00:56:23,820
verify that you're good to go you have

1261
00:56:27,950 --> 00:56:26,580
all your redundancy still working you

1262
00:56:31,100 --> 00:56:27,960
got enough per pound and so on and so

1263
00:56:34,160 --> 00:56:31,110

forth it's very very elaborate and

1264
00:56:36,350 --> 00:56:34,170
cautious approach I would say the arbor

1265
00:56:39,950 --> 00:56:36,360
has also certain advantages that if you

1266
00:56:42,320 --> 00:56:39,960
lose total control at one time you did

1267
00:56:46,340 --> 00:56:42,330
not eat not endangering the the ISS at

1268
00:56:48,290 --> 00:56:46,350
all it's a very safe approach it's it's

1269
00:56:50,090 --> 00:56:48,300
not not like tailgating basically yeah

1270
00:56:53,750 --> 00:56:50,100
you would you drop off if you lose

1271
00:56:55,220 --> 00:56:53,760
control so um as you work your way up on

1272
00:56:58,000 --> 00:56:55,230
the arbor which takes a couple hours you

1273
00:57:00,470 --> 00:56:58,010
then stop at 10 meters basically and

1274
00:57:04,670 --> 00:57:00,480
once we got the go for capture which is

1275
00:57:07,220 --> 00:57:04,680
always a traumatic moment I forgot

1276
00:57:09,050 --> 00:57:07,230
actually the time it's for its roughly

1277
00:57:11,210 --> 00:57:09,060
44 hours after launch so it's going in

1278
00:57:14,650 --> 00:57:11,220
the middle of the night instead of early

1279
00:57:17,690 --> 00:57:14,660
morning but once we get that command

1280
00:57:18,410 --> 00:57:17,700
dragon basically decides not to do

1281
00:57:20,660 --> 00:57:18,420
anything anymore

1282
00:57:22,780 --> 00:57:20,670
it isolates itself it shuts down

1283
00:57:26,230 --> 00:57:22,790
propellant so that there is no

1284
00:57:30,410 --> 00:57:26,240
Northwester firing when the station arm

1285
00:57:33,050 --> 00:57:30,420
grapples it and so he flies they're

1286
00:57:35,990 --> 00:57:33,060
gonna apply to a box right about 10

1287
00:57:37,910 --> 00:57:36,000
meters away from station and and as long

1288
00:57:40,700 --> 00:57:37,920

as they're in the in the box right then

1289
00:57:44,240 --> 00:57:40,710
then as Han says that at some point they

1290
00:57:46,730 --> 00:57:44,250
go to free drift the crew lose the the

1291
00:57:50,390 --> 00:57:46,740
latching end effector into grabs the

1292
00:57:52,280 --> 00:57:50,400
a vehicle and then and then rigid Isis

1293
00:57:54,890 --> 00:57:52,290
then at that point actually the ground

1294
00:57:56,570 --> 00:57:54,900
commands the arm the crew goes off and

1295
00:57:58,580 --> 00:57:56,580
does other things to grab the ground

1296
00:58:00,920 --> 00:57:58,590
commands the arm to put the dragon over

1297
00:58:02,600 --> 00:58:00,930
to the common berthing mechanism at that

1298
00:58:04,990 --> 00:58:02,610
point the crew comes back they operate

1299
00:58:16,060 --> 00:58:05,000
the CBM in conjunction with the ground

1300
00:58:19,040 --> 00:58:16,070
and attached to the station 0g News

1301
00:58:25,730 --> 00:58:19,050
which is basically about the range

1302
00:58:27,800 --> 00:58:25,740
around the autonomous spaceport drone in

1303
00:58:30,170 --> 00:58:27,810
respect of anything coming into it which

1304
00:58:32,870 --> 00:58:30,180
is like a ship that shouldn't be there

1305
00:58:35,080 --> 00:58:32,880
kind of thing what's the issue in

1306
00:58:38,090 --> 00:58:35,090
respect of all that just abort the

1307
00:58:41,870 --> 00:58:38,100
attempt and in respect of Mike I was

1308
00:58:43,640 --> 00:58:41,880
just wondering about any items within

1309
00:58:45,109 --> 00:58:43,650
the Dragon which is related to the

1310
00:58:46,960 --> 00:58:45,119
one-year mission that's coming up

1311
00:58:55,000 --> 00:58:46,970
whether you're starting to stage

1312
00:58:58,280 --> 00:58:56,300
okay

1313
00:59:02,800 --> 00:58:58,290

so any ship going in between or getting

1314
00:59:09,190 --> 00:59:05,570
it's obviously it's a safety safety

1315
00:59:12,440 --> 00:59:09,200
issue as this human life over over over

1316
00:59:16,250 --> 00:59:12,450
something else so you would chase it

1317
00:59:19,760 --> 00:59:16,260
away and yes dragon has some of supplies

1318
00:59:21,410 --> 00:59:19,770
for the one-year mission I think some of

1319
00:59:23,420 --> 00:59:21,420
its already up there and then some of it

1320
00:59:24,890 --> 00:59:23,430
comes up on on the dragon some of it

1321
00:59:28,099 --> 00:59:24,900
actually comes up on the vehicle if they

1322
00:59:30,200 --> 00:59:28,109
fly on as well so some so so a portion

1323
00:59:32,930 --> 00:59:30,210
of their their supplies go up on space

1324
00:59:37,410 --> 00:59:34,980
okay I'm sorry that we didn't get to

1325
00:59:39,870 --> 00:59:37,420
everyone's question but we have to wrap

1326
00:59:42,030 --> 00:59:39,880
it up and get ready for launch tomorrow

1327
00:59:44,970 --> 00:59:42,040
morning the exact liftoff time that we

1328
00:59:46,950 --> 00:59:44,980
have now is 6:20 and 29 seconds a.m.

1329
00:59:48,780 --> 00:59:46,960
Eastern Standard Time our NASA

1330
00:59:51,150 --> 00:59:48,790
television coverage will begin at 5:00

1331
00:59:53,010 --> 00:59:51,160
a.m. and between now and then you can