
NASA
FALCON
9

1
00:00:05,030 --> 00:00:13,270
[Music]

2
00:00:24,150 --> 00:00:14,700
started

3
00:00:24,160 --> 00:00:35,030
um

4
00:00:43,030 --> 00:00:35,930
between

5
00:00:43,040 --> 00:00:57,430
phases countries clears the tower

6
00:00:57,440 --> 00:01:08,510
to get us discoveries we are today

7
00:01:19,109 --> 00:01:14,650
[Music]

8
00:01:20,950 --> 00:01:19,119
good afternoon and welcome to nasa's

9
00:01:23,429 --> 00:01:20,960
kennedy space center in florida i'm

10
00:01:25,830 --> 00:01:23,439
joshua finch of nasa's communication

11
00:01:28,390 --> 00:01:25,840
we're here to discuss nasa's spacex demo

12
00:01:29,990 --> 00:01:28,400
2 mission teams from nasa and spacex

13
00:01:31,910 --> 00:01:30,000

just completed the flight readiness

14
00:01:34,069 --> 00:01:31,920
review and we're joined by participants

15
00:01:36,469 --> 00:01:34,079
who can tell us more about that review

16
00:01:38,710 --> 00:01:36,479
we'll first start with our presenters

17
00:01:41,830 --> 00:01:38,720
first we have nasa administrator jim

18
00:01:46,870 --> 00:01:43,990
nasa associate administrator steven

19
00:01:52,069 --> 00:01:49,030
kathy leaders manager of nasa's

20
00:01:53,429 --> 00:01:52,079
commercial crew program

21
00:01:55,350 --> 00:01:53,439
kirk shireman

22
00:01:57,749 --> 00:01:55,360
manager international space station

23
00:01:59,910 --> 00:01:57,759
program

24
00:02:02,630 --> 00:01:59,920
benji reed director of crew mission

25
00:02:04,149 --> 00:02:02,640
management at spacex

26
00:02:06,789 --> 00:02:04,159
and norm knight

27
00:02:09,830 --> 00:02:06,799
deputy director at nasa's johnson space

28
00:02:11,029 --> 00:02:09,840
center flight operations

29
00:02:12,630 --> 00:02:11,039
we're going to begin with opening

30
00:02:14,150 --> 00:02:12,640
comments from our presenters and then

31
00:02:15,589 --> 00:02:14,160
we'll turn it over to questions we're

32
00:02:17,589 --> 00:02:15,599
going to start with nasa administrator

33
00:02:18,869 --> 00:02:17,599
jim breinstein who does have to leave a

34
00:02:20,830 --> 00:02:18,879
little bit early during today's

35
00:02:24,070 --> 00:02:20,840
briefings so we'll start with mr

36
00:02:25,589 --> 00:02:24,080
breinstein well thank you josh and it is

37
00:02:28,309 --> 00:02:25,599
good to be here at the kennedy space

38
00:02:29,190 --> 00:02:28,319

center we are obviously in the media

39
00:02:31,589 --> 00:02:29,200
room

40
00:02:32,550 --> 00:02:31,599
where we have had many conferences

41
00:02:36,390 --> 00:02:32,560
before

42
00:02:39,430 --> 00:02:36,400
um you know i remember fondly demo one i

43
00:02:42,229 --> 00:02:39,440
remember fondly the launch abort test

44
00:02:43,910 --> 00:02:42,239
and this room was absolutely packed

45
00:02:45,350 --> 00:02:43,920
and here we are today

46
00:02:47,430 --> 00:02:45,360
in an empty room

47
00:02:49,430 --> 00:02:47,440
talking to cameras

48
00:02:51,110 --> 00:02:49,440
and all of us are six feet apart and of

49
00:02:53,030 --> 00:02:51,120
course we all walked in here with our

50
00:02:54,949 --> 00:02:53,040
masks on and

51
00:02:57,270 --> 00:02:54,959
and of course what we are doing here

52
00:02:59,190 --> 00:02:57,280
today exemplifies

53
00:03:01,190 --> 00:02:59,200
what we were doing in the in the launch

54
00:03:02,790 --> 00:03:01,200
readiness review

55
00:03:04,550 --> 00:03:02,800
so these are different times but it is

56
00:03:07,509 --> 00:03:04,560
also a time when we need to be doing

57
00:03:09,030 --> 00:03:07,519
amazing things as a nation and inspiring

58
00:03:10,149 --> 00:03:09,040
the entire world and that's what we're

59
00:03:12,710 --> 00:03:10,159
doing

60
00:03:14,949 --> 00:03:12,720
the flight readiness review is complete

61
00:03:15,990 --> 00:03:14,959
we have another milestone under our

62
00:03:17,589 --> 00:03:16,000
belts

63
00:03:20,630 --> 00:03:17,599

it was a good review

64
00:03:22,790 --> 00:03:20,640
great discussion um i think everybody in

65
00:03:24,229 --> 00:03:22,800
the room was very clear that now is the

66
00:03:25,990 --> 00:03:24,239
time to speak up if there are any

67
00:03:27,990 --> 00:03:26,000
challenges

68
00:03:29,589 --> 00:03:28,000
and and there were there were

69
00:03:31,350 --> 00:03:29,599
conversations that were had that were

70
00:03:34,149 --> 00:03:31,360
very important to be had

71
00:03:37,110 --> 00:03:34,159
but it's also true that at the end

72
00:03:38,390 --> 00:03:37,120
as as as each system and subsystem was

73
00:03:40,390 --> 00:03:38,400
considered

74
00:03:41,910 --> 00:03:40,400
at the end we got to a go

75
00:03:44,789 --> 00:03:41,920
so um

76
00:03:47,990 --> 00:03:44,799
so we are we are now preparing for a

77
00:03:49,750 --> 00:03:48,000
launch in in five short days so

78
00:03:52,149 --> 00:03:49,760
um i want to say it's good to be here at

79
00:03:54,710 --> 00:03:52,159
the kennedy space center

80
00:03:56,789 --> 00:03:54,720
there's a lot of work left to do the

81
00:03:57,509 --> 00:03:56,799
launch is on or the rocket is on the pad

82
00:03:59,350 --> 00:03:57,519
and

83
00:04:01,030 --> 00:03:59,360
we've got a static fire in front of us

84
00:04:02,949 --> 00:04:01,040
or i should say a hot fire in front of

85
00:04:05,030 --> 00:04:02,959
us as well as

86
00:04:07,350 --> 00:04:05,040
a lot of checks to do but

87
00:04:10,390 --> 00:04:07,360
but the the launch readiness review was

88
00:04:12,550 --> 00:04:10,400

good and um and we are a go so with that

89
00:04:14,390 --> 00:04:12,560
josh i'll turn it back over to you

90
00:04:16,310 --> 00:04:14,400
thank you and now we'll go to stephen

91
00:04:18,789 --> 00:04:16,320
jersey

92
00:04:20,390 --> 00:04:18,799
thank you josh um so first i want to say

93
00:04:23,110 --> 00:04:20,400
it was a

94
00:04:25,909 --> 00:04:23,120
an honor to chair the first flight

95
00:04:28,550 --> 00:04:25,919
readiness review for a crew

96
00:04:29,909 --> 00:04:28,560
transportation system developed in the

97
00:04:31,510 --> 00:04:29,919
u.s

98
00:04:33,830 --> 00:04:31,520
in nine years

99
00:04:34,870 --> 00:04:33,840
so it was i definitely was honor and i

100
00:04:36,310 --> 00:04:34,880
was humbled

101
00:04:37,590 --> 00:04:36,320
to be the chair of the flight readiness

102
00:04:39,830 --> 00:04:37,600
review

103
00:04:40,790 --> 00:04:39,840
for the spacex commercial crew demo 2

104
00:04:42,950 --> 00:04:40,800
flight

105
00:04:45,110 --> 00:04:42,960
like jim said it was an excellent review

106
00:04:46,629 --> 00:04:45,120
i knew going in that the team was ready

107
00:04:48,469 --> 00:04:46,639
we were and we were ready to do this

108
00:04:51,350 --> 00:04:48,479
review and they absolutely demonstrated

109
00:04:53,189 --> 00:04:51,360
that that during the review um day and a

110
00:04:55,189 --> 00:04:53,199
half of really good

111
00:04:56,390 --> 00:04:55,199
presentations really good discussions

112
00:04:58,469 --> 00:04:56,400
and we accomplished what we needed to

113
00:05:00,790 --> 00:04:58,479

accomplish to determine that we are

114
00:05:03,029 --> 00:05:00,800
ready for flight

115
00:05:04,710 --> 00:05:03,039
there are no significant open issues i

116
00:05:06,550 --> 00:05:04,720
am happy to report

117
00:05:08,310 --> 00:05:06,560
it was a very in the end it was a very

118
00:05:11,189 --> 00:05:08,320
very clean review

119
00:05:13,350 --> 00:05:11,199
there's just the planned forward work um

120
00:05:15,749 --> 00:05:13,360
to get done there's quite a bit of it

121
00:05:19,189 --> 00:05:15,759
between now and launch um but we are

122
00:05:21,110 --> 00:05:19,199
ready to launch on wednesday may 27th at

123
00:05:24,310 --> 00:05:21,120
4 33 p.m

124
00:05:27,749 --> 00:05:24,320
and uh it is um it's it's the uh a

125
00:05:30,390 --> 00:05:27,759
credit to the team the spacex nasa team

126
00:05:33,189 --> 00:05:30,400
for their hard work and dedication

127
00:05:34,790 --> 00:05:33,199
um to get to this point um one thing i

128
00:05:37,510 --> 00:05:34,800
mentioned in the flight readiness review

129
00:05:38,550 --> 00:05:37,520
is this team represents the values of

130
00:05:40,070 --> 00:05:38,560
nasa

131
00:05:42,550 --> 00:05:40,080
um safety

132
00:05:44,710 --> 00:05:42,560
they have been laser focused on um

133
00:05:46,550 --> 00:05:44,720
safely launching bob and doug into space

134
00:05:49,110 --> 00:05:46,560
getting them to the space station and

135
00:05:50,790 --> 00:05:49,120
returning them home safely i've teamwork

136
00:05:53,830 --> 00:05:50,800
i've never seen a team work together

137
00:05:56,710 --> 00:05:53,840
this effectively uh to to conquer the

138
00:05:58,790 --> 00:05:56,720

challenges to get to this point

139
00:06:01,270 --> 00:05:58,800
integrity in everything they've done i

140
00:06:03,990 --> 00:06:01,280
just been so impressed with the

141
00:06:07,189 --> 00:06:04,000
openness and frankness of all our

142
00:06:09,029 --> 00:06:07,199
discussions which is really critical

143
00:06:11,510 --> 00:06:09,039
to get to

144
00:06:13,430 --> 00:06:11,520
the point we're ready to launch and then

145
00:06:15,830 --> 00:06:13,440
excellence if you were in the flight

146
00:06:17,670 --> 00:06:15,840
race interview and heard the briefings

147
00:06:21,029 --> 00:06:17,680
from the engineering team

148
00:06:23,270 --> 00:06:21,039
just incredible uh engineers and they

149
00:06:27,590 --> 00:06:23,280
demonstrated the uh the excellence that

150
00:06:29,189 --> 00:06:27,600
we expect uh from both uh spacex as well

151
00:06:30,629 --> 00:06:29,199
as uh nasa

152
00:06:33,590 --> 00:06:30,639
and i could not be more proud of the

153
00:06:36,309 --> 00:06:33,600
team so thank you very much josh

154
00:06:37,510 --> 00:06:36,319
and we'll now go to kathy leaders kathy

155
00:06:38,390 --> 00:06:37,520
wow

156
00:06:41,430 --> 00:06:38,400
oh

157
00:06:44,469 --> 00:06:41,440
a really big day for the joint nasa

158
00:06:46,469 --> 00:06:44,479
spacex commercial crew team

159
00:06:49,270 --> 00:06:46,479
i am so grateful

160
00:06:50,870 --> 00:06:49,280
for the nasa and spacex team who have

161
00:06:52,950 --> 00:06:50,880
dug deep

162
00:06:54,390 --> 00:06:52,960
and worked so hard to get us to this

163
00:06:55,670 --> 00:06:54,400

point

164
00:06:57,909 --> 00:06:55,680
just

165
00:07:00,309 --> 00:06:57,919
we have a tremendous team

166
00:07:03,029 --> 00:07:00,319
and i'm very very proud of them i'm

167
00:07:05,909 --> 00:07:03,039
proud of the opportunity we had to be

168
00:07:07,189 --> 00:07:05,919
able to present to the agency

169
00:07:08,950 --> 00:07:07,199
our readiness

170
00:07:11,029 --> 00:07:08,960
and then have them agree

171
00:07:12,870 --> 00:07:11,039
so very very proud of the team very

172
00:07:13,909 --> 00:07:12,880
proud of the team and the culmination of

173
00:07:17,110 --> 00:07:13,919
their work

174
00:07:20,150 --> 00:07:17,120
um i'm just i'm

175
00:07:21,670 --> 00:07:20,160
in awe that i get to lead this team it's

176
00:07:23,670 --> 00:07:21,680
really an honor

177
00:07:25,589 --> 00:07:23,680
but we're not done you know we talked a

178
00:07:26,469 --> 00:07:25,599
few weeks ago about we got to do this

179
00:07:28,710 --> 00:07:26,479
right

180
00:07:30,070 --> 00:07:28,720
and we got to launch bob and doug

181
00:07:31,670 --> 00:07:30,080
we got to make sure they're taken care

182
00:07:34,230 --> 00:07:31,680
of on orbit

183
00:07:37,110 --> 00:07:34,240
and we've got to make sure they get home

184
00:07:39,189 --> 00:07:37,120
and we are committed to do that

185
00:07:40,710 --> 00:07:39,199
and we're going to stay vigilant over

186
00:07:43,510 --> 00:07:40,720
the next few days

187
00:07:46,550 --> 00:07:43,520
we still have a static fire uh jim you

188
00:07:47,589 --> 00:07:46,560

did get that right it is a static fire

189
00:07:49,749 --> 00:07:47,599
um

190
00:07:51,749 --> 00:07:49,759
and we tomorrow we have also another

191
00:07:53,670 --> 00:07:51,759
really important event it's a dry dress

192
00:07:55,830 --> 00:07:53,680
it's it's kind of our last

193
00:07:57,430 --> 00:07:55,840
uh run through with the crew to make

194
00:07:58,869 --> 00:07:57,440
sure that we're really ready to get

195
00:08:00,469 --> 00:07:58,879
ready for launch

196
00:08:02,629 --> 00:08:00,479
and then we have our final launch

197
00:08:04,710 --> 00:08:02,639
readiness review on monday

198
00:08:06,150 --> 00:08:04,720
so um

199
00:08:08,390 --> 00:08:06,160
i'm really proud of this team we're

200
00:08:10,790 --> 00:08:08,400
gonna take it one step at a time and

201
00:08:13,350 --> 00:08:10,800
we're gonna still fly when we're ready

202
00:08:16,550 --> 00:08:13,360
but thank you to my whole team to the

203
00:08:17,350 --> 00:08:16,560
nasa team to the spacex team to the iss

204
00:08:21,270 --> 00:08:17,360
team

205
00:08:24,869 --> 00:08:23,270
and we'll now go to kirkshirem

206
00:08:27,589 --> 00:08:24,879
good afternoon it's a great pleasure to

207
00:08:29,270 --> 00:08:27,599
be here i'm very excited to uh

208
00:08:30,469 --> 00:08:29,280
have been able to participate in this

209
00:08:32,550 --> 00:08:30,479
review

210
00:08:35,110 --> 00:08:32,560
so much like we have the preparations

211
00:08:37,509 --> 00:08:35,120
kathy was describing here on on the

212
00:08:39,029 --> 00:08:37,519
planet i can tell you there's great

213
00:08:41,589 --> 00:08:39,039

things and preparations going on on

214
00:08:43,990 --> 00:08:41,599
orbit so last wednesday jaxa launched

215
00:08:45,430 --> 00:08:44,000
the htv and so as we're conducting our

216
00:08:47,590 --> 00:08:45,440
review here

217
00:08:49,910 --> 00:08:47,600
the htv is rapidly catching up the

218
00:08:52,150 --> 00:08:49,920
international space station and will be

219
00:08:54,470 --> 00:08:52,160
arriving to the iss on monday so just a

220
00:08:56,630 --> 00:08:54,480
few days before demo 2 launches it'll

221
00:08:59,110 --> 00:08:56,640
arrive to iss it'll be grappled by chris

222
00:08:59,990 --> 00:08:59,120
cassidy and by the time demo 2 arrives

223
00:09:04,630 --> 00:09:00,000
it'll be

224
00:09:07,910 --> 00:09:04,640
i had a chance to talk to the on albert

225
00:09:09,670 --> 00:09:07,920
crew so chris yvonne and anatoly

226
00:09:11,030 --> 00:09:09,680
wednesday just shortly just just a few

227
00:09:13,190 --> 00:09:11,040
minutes really before i left to come

228
00:09:15,269 --> 00:09:13,200
down here to the kennedy space center

229
00:09:16,710 --> 00:09:15,279
i can tell you those guys are very

230
00:09:20,230 --> 00:09:16,720
focused very

231
00:09:21,590 --> 00:09:20,240
excited and are preparing for having bob

232
00:09:22,870 --> 00:09:21,600
and doug arrive

233
00:09:27,030 --> 00:09:22,880
on orbit so

234
00:09:30,949 --> 00:09:29,269
and finally i'm coming home and we'll

235
00:09:33,190 --> 00:09:30,959
bring home bob and doug safely but we're

236
00:09:35,590 --> 00:09:33,200
also counting on bringing home some some

237
00:09:38,230 --> 00:09:35,600
experimental results on on the dragon

238
00:09:39,430 --> 00:09:38,240

too so a great test flight but also the

239
00:09:42,310 --> 00:09:39,440
ability to

240
00:09:44,310 --> 00:09:42,320
to make use of the of that vehicle to

241
00:09:46,070 --> 00:09:44,320
bring home some some experiments that

242
00:09:48,310 --> 00:09:46,080
have been on orbit for a while so

243
00:09:50,550 --> 00:09:48,320
looking forward to that opportunity

244
00:09:52,870 --> 00:09:50,560
so this year we're celebrating 20 years

245
00:09:55,990 --> 00:09:52,880
of having humans living and working in

246
00:09:59,430 --> 00:09:56,000
space and uh and we're very very much

247
00:10:00,870 --> 00:09:59,440
excited to have um the first humans

248
00:10:05,030 --> 00:10:00,880
launched the international space station

249
00:10:06,470 --> 00:10:05,040
since july 8 2011. so july 8 2011 last

250
00:10:08,630 --> 00:10:06,480
time

251
00:10:10,150 --> 00:10:08,640
humans left the planet here in kennedy

252
00:10:11,910 --> 00:10:10,160
and the kennedy space center and went to

253
00:10:14,150 --> 00:10:11,920
the international space station very

254
00:10:16,550 --> 00:10:14,160
much looking forward to next week

255
00:10:18,310 --> 00:10:16,560
having bob and doug on orbit continuing

256
00:10:20,790 --> 00:10:18,320
human uh presence in national space

257
00:10:22,630 --> 00:10:20,800
station learning and exploring uh so

258
00:10:24,949 --> 00:10:22,640
with that it's my great pleasure to uh

259
00:10:27,750 --> 00:10:24,959
to introduce to you uh benji reed

260
00:10:29,670 --> 00:10:27,760
director at uh spacex and a good friend

261
00:10:31,590 --> 00:10:29,680
he and his team have worked tremendously

262
00:10:33,750 --> 00:10:31,600
over the last few years to make us here

263
00:10:36,310 --> 00:10:33,760

today so benji

264
00:10:38,069 --> 00:10:36,320
thank you very much kirk you know it is

265
00:10:39,269 --> 00:10:38,079
um use the word they're friends and i

266
00:10:41,350 --> 00:10:39,279
think it's important you know we're not

267
00:10:42,870 --> 00:10:41,360
just colleagues here um

268
00:10:45,509 --> 00:10:42,880
or even just partners

269
00:10:46,949 --> 00:10:45,519
over the years we've built friendships

270
00:10:48,790 --> 00:10:46,959
but in those friendships we hold each

271
00:10:50,470 --> 00:10:48,800
other accountable

272
00:10:53,030 --> 00:10:50,480
it's an honor

273
00:10:55,190 --> 00:10:53,040
the responsibility that we carry

274
00:10:56,310 --> 00:10:55,200
jointly with nasa and our friends and

275
00:10:58,949 --> 00:10:56,320
partners

276
00:11:00,389 --> 00:10:58,959
and our company at spacex

277
00:11:02,550 --> 00:11:00,399
and it's a sacred honor

278
00:11:05,590 --> 00:11:02,560
and and those are meaningful words when

279
00:11:07,269 --> 00:11:05,600
we say that our job is to carry bob and

280
00:11:08,710 --> 00:11:07,279
doug to the space station

281
00:11:11,110 --> 00:11:08,720
hand them to kirk

282
00:11:13,030 --> 00:11:11,120
let them do what they get to do on space

283
00:11:14,790 --> 00:11:13,040
station help keep the space station

284
00:11:16,150 --> 00:11:14,800
running and safe and then we need to

285
00:11:19,190 --> 00:11:16,160
bring them home safely back to their

286
00:11:21,190 --> 00:11:19,200
families as we like to often uh mention

287
00:11:23,670 --> 00:11:21,200
you know they are dads

288
00:11:25,269 --> 00:11:23,680

they've got families back home

289
00:11:26,790 --> 00:11:25,279
and it's just just as important as we're

290
00:11:28,790 --> 00:11:26,800
all taking care of each other through

291
00:11:30,710 --> 00:11:28,800
these interesting times we're needing to

292
00:11:31,750 --> 00:11:30,720
take care of the crew and bring them

293
00:11:33,990 --> 00:11:31,760
home

294
00:11:35,910 --> 00:11:34,000
and again on that sacred journey

295
00:11:37,829 --> 00:11:35,920
together we all are holding each other

296
00:11:39,829 --> 00:11:37,839
accountable and as kathy said there's

297
00:11:42,949 --> 00:11:39,839
more to do today we got to go and it was

298
00:11:45,350 --> 00:11:42,959
a monumental and incredible journey to

299
00:11:47,509 --> 00:11:45,360
get to today's review but

300
00:11:49,190 --> 00:11:47,519
we still have our static fire this

301
00:11:51,030 --> 00:11:49,200
afternoon our dry dress as kathy

302
00:11:52,550 --> 00:11:51,040
mentioned tomorrow and we have our own

303
00:11:55,590 --> 00:11:52,560
launch readiness review

304
00:11:57,590 --> 00:11:55,600
which nasa will be attending and with us

305
00:11:59,110 --> 00:11:57,600
just before launch to ensure that we're

306
00:12:01,110 --> 00:11:59,120
really ready

307
00:12:03,590 --> 00:12:01,120
but just to talk a little bit about what

308
00:12:05,509 --> 00:12:03,600
got us in the you know recently to today

309
00:12:07,269 --> 00:12:05,519
uh we've got a few photos i thought

310
00:12:10,629 --> 00:12:07,279
might be nice to bring up uh there's

311
00:12:13,430 --> 00:12:10,639
dragon um getting ready to uh be

312
00:12:15,430 --> 00:12:13,440
transported um from uh where we prepare

313
00:12:17,030 --> 00:12:15,440

the vehicles over to the hangar

314
00:12:19,750 --> 00:12:17,040
um we can go to the next shot and

315
00:12:20,790 --> 00:12:19,760
there's dragon um and falcon mated

316
00:12:23,350 --> 00:12:20,800
together

317
00:12:25,269 --> 00:12:23,360
uh ready to roll out to the pad we'll go

318
00:12:27,829 --> 00:12:25,279
to the next shot and there they are

319
00:12:30,150 --> 00:12:27,839
they're in the transport erector the uh

320
00:12:32,949 --> 00:12:30,160
the barn door is open the uh the door to

321
00:12:34,310 --> 00:12:32,959
the hanger is open and dragon is ready

322
00:12:37,670 --> 00:12:34,320
to leave

323
00:12:39,269 --> 00:12:37,680
heading up to the pad and there they are

324
00:12:41,910 --> 00:12:39,279
erected on the pad

325
00:12:44,710 --> 00:12:41,920
um the crew arm there is has moved into

326
00:12:46,150 --> 00:12:44,720
position it's uh attached to or against

327
00:12:47,750 --> 00:12:46,160
the dragon now and

328
00:12:50,870 --> 00:12:47,760
and uh we're ready we're ready to go

329
00:12:54,150 --> 00:12:50,880
into static fire now in just uh a little

330
00:12:56,470 --> 00:12:54,160
bit about an hour and a half from now

331
00:12:57,910 --> 00:12:56,480
we talk a lot about uh the whole mission

332
00:12:59,269 --> 00:12:57,920
today we've got to go to launch but

333
00:13:01,110 --> 00:12:59,279
really it's a go to the mission there'll

334
00:13:03,030 --> 00:13:01,120
be lots more data lots more reviews in

335
00:13:06,150 --> 00:13:03,040
the next few days there'll be constant

336
00:13:07,509 --> 00:13:06,160
vigilance and watching of the data and

337
00:13:08,389 --> 00:13:07,519
observations as we go through the

338
00:13:09,509 --> 00:13:08,399

mission

339
00:13:11,350 --> 00:13:09,519
there'll be other reviews and

340
00:13:14,150 --> 00:13:11,360
conversations to make sure we're go for

341
00:13:15,829 --> 00:13:14,160
each aspect including go to come home

342
00:13:17,269 --> 00:13:15,839
but really we always need to think about

343
00:13:20,150 --> 00:13:17,279
this as an entire mission and again

344
00:13:21,910 --> 00:13:20,160
bringing bob and doug home safely and to

345
00:13:23,670 --> 00:13:21,920
that end i think we've got a new video

346
00:13:25,590 --> 00:13:23,680
that we've pulled together to show our

347
00:13:27,110 --> 00:13:25,600
parachutes

348
00:13:29,090 --> 00:13:27,120
and a new compilation of all the

349
00:13:40,069 --> 00:13:29,100
parachute work that we've done

350
00:13:40,079 --> 00:13:46,500
so

351
00:14:15,210 --> 00:14:11,430
[Music]

352
00:14:15,220 --> 00:14:18,570
[Applause]

353
00:14:18,580 --> 00:14:24,069
[Music]

354
00:14:28,150 --> 00:14:25,910
that last shot there is a beautiful

355
00:14:30,550 --> 00:14:28,160
image of the capsule coming home from

356
00:14:33,509 --> 00:14:30,560
our demo one test

357
00:14:37,269 --> 00:14:33,519
and you know it is so incredible being

358
00:14:38,790 --> 00:14:37,279
here uh here at kennedy space center um

359
00:14:40,470 --> 00:14:38,800
the you know the home of launching

360
00:14:41,910 --> 00:14:40,480
astronauts from space of american

361
00:14:44,230 --> 00:14:41,920
astronauts from american soil on

362
00:14:45,670 --> 00:14:44,240
american vehicles and and we get to do

363
00:14:47,269 --> 00:14:45,680

it again in just

364
00:14:49,670 --> 00:14:47,279
five days and so on behalf of all the

365
00:14:51,350 --> 00:14:49,680
teams working dragon and falcon and

366
00:14:53,670 --> 00:14:51,360
and uh you know hardware and software

367
00:14:55,829 --> 00:14:53,680
teams and everybody in our factory all

368
00:14:58,470 --> 00:14:55,839
the way to our operations groups we are

369
00:15:00,550 --> 00:14:58,480
honored to be um that you the nasa has

370
00:15:02,470 --> 00:15:00,560
trusted us with this endeavor that bob

371
00:15:04,629 --> 00:15:02,480
and doug trust us

372
00:15:07,750 --> 00:15:04,639
and uh we're excited to do it

373
00:15:11,750 --> 00:15:10,150
and now we'll go to norm night all right

374
00:15:13,750 --> 00:15:11,760
well it's a real honor to be here with

375
00:15:17,189 --> 00:15:13,760
you this afternoon it was uh it was a

376
00:15:19,670 --> 00:15:17,199
fun two days very long days

377
00:15:22,150 --> 00:15:19,680
uh but from a crew perspective this

378
00:15:23,910 --> 00:15:22,160
review was fantastic uh we're satisfied

379
00:15:26,150 --> 00:15:23,920
with the discussions that were had the

380
00:15:27,670 --> 00:15:26,160
thoroughness and the readiness of folks

381
00:15:28,870 --> 00:15:27,680
coming in and having the necessary

382
00:15:30,470 --> 00:15:28,880
discussions

383
00:15:32,470 --> 00:15:30,480
to assure that

384
00:15:34,310 --> 00:15:32,480
doug and bob are safe

385
00:15:36,310 --> 00:15:34,320
and again it's crew safety vehicle

386
00:15:37,670 --> 00:15:36,320
safety and test flight objectives in

387
00:15:40,069 --> 00:15:37,680
that order

388
00:15:42,470 --> 00:15:40,079

as far as the discussion goes with with

389
00:15:43,990 --> 00:15:42,480
respect to to risk and how that risk is

390
00:15:45,590 --> 00:15:44,000
managed so we're very satisfied with

391
00:15:47,749 --> 00:15:45,600
that and we're thankful

392
00:15:50,069 --> 00:15:47,759
for the teams not only at spacex but

393
00:15:53,030 --> 00:15:50,079
across the agency with engineers and

394
00:15:55,030 --> 00:15:53,040
safety engineers and integration

395
00:15:58,150 --> 00:15:55,040
folks that have really pulled together

396
00:16:01,030 --> 00:15:58,160
to make this a success so

397
00:16:02,790 --> 00:16:01,040
again it was a it was a really good day

398
00:16:05,590 --> 00:16:02,800
but you know it didn't just start with

399
00:16:07,829 --> 00:16:05,600
this review it was really a journey

400
00:16:10,470 --> 00:16:07,839
that again friendship and partnership

401
00:16:11,990 --> 00:16:10,480
with spacex that started many years ago

402
00:16:13,189 --> 00:16:12,000
and the astronaut office has been

403
00:16:14,550 --> 00:16:13,199
actively

404
00:16:16,710 --> 00:16:14,560
involved

405
00:16:18,870 --> 00:16:16,720
with spacex it was a joint test team

406
00:16:20,150 --> 00:16:18,880
that was formed to to embed the

407
00:16:22,949 --> 00:16:20,160
astronauts

408
00:16:24,150 --> 00:16:22,959
and our team members in with spacex to

409
00:16:26,150 --> 00:16:24,160
work together

410
00:16:28,310 --> 00:16:26,160
to to work in the development to work

411
00:16:30,629 --> 00:16:28,320
into the human factors

412
00:16:33,030 --> 00:16:30,639
and to make sure that the training was

413
00:16:34,389 --> 00:16:33,040

done and conducted in a joint manner so

414
00:16:36,629 --> 00:16:34,399
that we can

415
00:16:39,030 --> 00:16:36,639
again meet those objectives of crew

416
00:16:40,949 --> 00:16:39,040
safety and vehicle safety

417
00:16:42,550 --> 00:16:40,959
uh that was done very well that was a

418
00:16:44,470 --> 00:16:42,560
great journey a lot of folks were

419
00:16:46,310 --> 00:16:44,480
involved with that and

420
00:16:47,990 --> 00:16:46,320
and it was very successful

421
00:16:50,870 --> 00:16:48,000
the trust that was built with these

422
00:16:53,030 --> 00:16:50,880
teams over many years will pay infinite

423
00:16:55,110 --> 00:16:53,040
dividends because that trust

424
00:16:56,870 --> 00:16:55,120
i call it the fabric of trust

425
00:16:58,550 --> 00:16:56,880
it's what holds us together as teams

426
00:16:59,910 --> 00:16:58,560
when things get stressed and strained

427
00:17:02,150 --> 00:16:59,920
and we're working

428
00:17:03,990 --> 00:17:02,160
issues and anomalies and getting ready

429
00:17:05,350 --> 00:17:04,000
for flight test readiness reviews and

430
00:17:07,029 --> 00:17:05,360
things like that that's what's going to

431
00:17:08,390 --> 00:17:07,039
hold us together for this and that's

432
00:17:10,150 --> 00:17:08,400
what's going to hold us together

433
00:17:12,309 --> 00:17:10,160
throughout this whole mission

434
00:17:14,390 --> 00:17:12,319
from the time the crew leaves astronaut

435
00:17:16,470 --> 00:17:14,400
crew quarters to the time that they are

436
00:17:19,029 --> 00:17:16,480
returned and safely

437
00:17:21,350 --> 00:17:19,039
touched down and return back to their

438
00:17:23,829 --> 00:17:21,360

families that is all of our objectives

439
00:17:27,270 --> 00:17:23,839
whether you're from spacex or nasa is

440
00:17:29,110 --> 00:17:27,280
get the crew back safely today was also

441
00:17:31,830 --> 00:17:29,120
another great milestone

442
00:17:34,549 --> 00:17:31,840
really in the continued

443
00:17:37,669 --> 00:17:34,559
and and road that nasa is paving for

444
00:17:39,350 --> 00:17:37,679
human exploration and it's great uh it

445
00:17:41,750 --> 00:17:39,360
dovetails right in with artemis and it's

446
00:17:43,270 --> 00:17:41,760
part of this overall objective of nasa

447
00:17:45,510 --> 00:17:43,280
paving a road that our commercial

448
00:17:47,750 --> 00:17:45,520
partners are going to travel upon as we

449
00:17:49,990 --> 00:17:47,760
go forward so very exciting

450
00:17:52,150 --> 00:17:50,000
give you a quick preview of the crew

451
00:17:55,590 --> 00:17:52,160
schedule as we go forward tomorrow is a

452
00:17:56,789 --> 00:17:55,600
big day as kathy said it's the dry dress

453
00:17:58,950 --> 00:17:56,799
the crew will get up in the morning

454
00:18:01,430 --> 00:17:58,960
around 8 a.m and start doing dry dress

455
00:18:03,590 --> 00:18:01,440
preparations they'll get some briefings

456
00:18:05,830 --> 00:18:03,600
they'll suit up they'll head to the pad

457
00:18:07,029 --> 00:18:05,840
and it'll be a dry dress and a practice

458
00:18:08,470 --> 00:18:07,039
run

459
00:18:10,470 --> 00:18:08,480
and prep for launch so we're very

460
00:18:12,150 --> 00:18:10,480
excited with that the culmination of

461
00:18:14,150 --> 00:18:12,160
that will be

462
00:18:15,430 --> 00:18:14,160
a debrief they'll head back to the

463
00:18:17,029 --> 00:18:15,440

astronaut crew quarters where they've

464
00:18:18,789 --> 00:18:17,039
been in quarantine

465
00:18:20,870 --> 00:18:18,799
and start getting

466
00:18:22,230 --> 00:18:20,880
prepared for additional training and

467
00:18:24,390 --> 00:18:22,240
launch preps

468
00:18:26,150 --> 00:18:24,400
so with that again it's an honor to be

469
00:18:27,510 --> 00:18:26,160
here

470
00:18:29,029 --> 00:18:27,520
thank you norm

471
00:18:30,549 --> 00:18:29,039
and i believe that's about the time that

472
00:18:32,070 --> 00:18:30,559
we have today with administrator jim

473
00:18:33,909 --> 00:18:32,080
breinstein thank you for being with us

474
00:18:35,190 --> 00:18:33,919
for opening comments and we're now going

475
00:18:37,190 --> 00:18:35,200
to transition over to taking your

476
00:18:39,430 --> 00:18:37,200
questions you can take questions using

477
00:18:41,430 --> 00:18:39,440
the hashtag ask nasa and then of course

478
00:18:43,110 --> 00:18:41,440
we have media dialed in on the phone

479
00:18:45,590 --> 00:18:43,120
bridge so we'll start with our first

480
00:18:48,150 --> 00:18:45,600
question from michael sheets

481
00:18:52,630 --> 00:18:50,470
hi folks uh thanks again as always for

482
00:18:53,830 --> 00:18:52,640
hosting this i'm really

483
00:18:57,190 --> 00:18:53,840
curious

484
00:18:58,150 --> 00:18:57,200
in in the length and thoroughness of

485
00:19:01,750 --> 00:18:58,160
this

486
00:19:04,789 --> 00:19:01,760
uh review that we did the last two days

487
00:19:08,070 --> 00:19:04,799
aside from the technical takeaways

488
00:19:10,710 --> 00:19:08,080

what what should people understand about

489
00:19:13,350 --> 00:19:10,720
what the this panel together concluded

490
00:19:16,070 --> 00:19:13,360
in preparation for demo two is this a a

491
00:19:18,470 --> 00:19:16,080
spacecraft that nasa has deemed uh human

492
00:19:20,789 --> 00:19:18,480
rated is that the the broad takeaway and

493
00:19:23,350 --> 00:19:20,799
you know how do people who aren't maybe

494
00:19:25,830 --> 00:19:23,360
as savvy uh with the industry should

495
00:19:28,549 --> 00:19:25,840
understand this means uh in preparation

496
00:19:33,029 --> 00:19:31,029
okay so um yeah i mean first and

497
00:19:34,710 --> 00:19:33,039
foremost this was a readiness review for

498
00:19:37,430 --> 00:19:34,720
the demo to launch

499
00:19:40,549 --> 00:19:37,440
um so we went over like mr breinstein

500
00:19:42,310 --> 00:19:40,559
discussed all the all the systems on the

501
00:19:43,909 --> 00:19:42,320
spacecraft on the launch vehicle on the

502
00:19:47,510 --> 00:19:43,919
ground

503
00:19:49,990 --> 00:19:47,520
and ensured that all the issues

504
00:19:51,990 --> 00:19:50,000
had been closed satisfactorily and they

505
00:19:54,710 --> 00:19:52,000
were in fact they were all those issues

506
00:19:56,630 --> 00:19:54,720
were closed out prior to the review

507
00:19:58,470 --> 00:19:56,640
all the waivers all the deviations all

508
00:20:00,230 --> 00:19:58,480
the requirements verifications all of

509
00:20:03,350 --> 00:20:00,240
that was done prior to the review and

510
00:20:06,070 --> 00:20:03,360
closed out um by the program both both

511
00:20:08,789 --> 00:20:06,080
nasa and spacex

512
00:20:11,110 --> 00:20:08,799
so it was a very successful fr for demo

513
00:20:13,510 --> 00:20:11,120

too it also was an

514
00:20:14,870 --> 00:20:13,520
interim human rating certification

515
00:20:17,430 --> 00:20:14,880
review

516
00:20:20,310 --> 00:20:17,440
and what i mean by interim is that

517
00:20:22,149 --> 00:20:20,320
we validated that this system meets the

518
00:20:24,470 --> 00:20:22,159
human human rating certification

519
00:20:27,110 --> 00:20:24,480
requirements um

520
00:20:29,430 --> 00:20:27,120
for the demo 2 mission

521
00:20:31,510 --> 00:20:29,440
and those requirements feed forward to

522
00:20:32,470 --> 00:20:31,520
future missions including the crew 1

523
00:20:34,149 --> 00:20:32,480
mission

524
00:20:35,830 --> 00:20:34,159
we will have a final human rating

525
00:20:38,549 --> 00:20:35,840
certification interview

526
00:20:39,510 --> 00:20:38,559
after demo 2 and before the crew 1

527
00:20:43,029 --> 00:20:39,520
mission

528
00:20:46,070 --> 00:20:43,039
just to certify the relatively

529
00:20:48,070 --> 00:20:46,080
small set of design changes between

530
00:20:51,029 --> 00:20:48,080
the demo 2 system and the crew one

531
00:20:54,630 --> 00:20:51,039
system and at that point well deemed the

532
00:20:56,710 --> 00:20:54,640
system uh human rating certified uh but

533
00:20:59,430 --> 00:20:56,720
today's review and the interim rating

534
00:21:02,310 --> 00:20:59,440
certification uh went a long way to uh

535
00:21:04,789 --> 00:21:02,320
certifying the system for uh for crude

536
00:21:09,909 --> 00:21:06,310
and our next question is from marina

537
00:21:12,470 --> 00:21:09,919
coron from the atlantic marina

538
00:21:13,270 --> 00:21:12,480

hi everyone kirk this is a question for

539
00:21:14,710 --> 00:21:13,280
you

540
00:21:16,149 --> 00:21:14,720
last year before the uncrew

541
00:21:17,669 --> 00:21:16,159
demonstration flight there was some

542
00:21:19,909 --> 00:21:17,679
disagreement between you and your

543
00:21:22,549 --> 00:21:19,919
russian counterparts about the capsule's

544
00:21:24,630 --> 00:21:22,559
approach to the iss which of course was

545
00:21:26,630 --> 00:21:24,640
resolved before launch

546
00:21:28,710 --> 00:21:26,640
did any officials from ross cosmos

547
00:21:32,390 --> 00:21:28,720
provide any dissenting opinions this

548
00:21:35,990 --> 00:21:34,149
well rose cosmos actually was part of

549
00:21:37,750 --> 00:21:36,000
our review for the last two days so ross

550
00:21:39,669 --> 00:21:37,760
cosmos a number of of our russian

551
00:21:41,830 --> 00:21:39,679
colleagues participated uh and they

552
00:21:43,430 --> 00:21:41,840
participated from moscow so while there

553
00:21:45,830 --> 00:21:43,440
were long days for us they were actually

554
00:21:47,510 --> 00:21:45,840
long nights for our russian colleagues

555
00:21:50,070 --> 00:21:47,520
by the way our japanese colleagues

556
00:21:51,190 --> 00:21:50,080
participated from japan so quite quite

557
00:21:55,270 --> 00:21:51,200
the

558
00:21:57,430 --> 00:21:55,280
marathon for many of us but

559
00:22:00,789 --> 00:21:57,440
russia our russian colleagues work with

560
00:22:02,950 --> 00:22:00,799
us in the interim between demo one and

561
00:22:04,310 --> 00:22:02,960
demo two i we've had countless

562
00:22:06,710 --> 00:22:04,320
discussions with them about all the

563
00:22:09,510 --> 00:22:06,720

requirements about uh all the waivers

564
00:22:11,110 --> 00:22:09,520
that we've taken and uh and so we went

565
00:22:12,870 --> 00:22:11,120
through all those technically explained

566
00:22:13,909 --> 00:22:12,880
to our russian colleagues answered their

567
00:22:16,870 --> 00:22:13,919
questions

568
00:22:19,350 --> 00:22:16,880
and finally a a big shout out to spacex

569
00:22:22,230 --> 00:22:19,360
one of the big concerns that that rose

570
00:22:24,070 --> 00:22:22,240
cosmos had was a a very very remote

571
00:22:26,789 --> 00:22:24,080
possibility of a failure but if that

572
00:22:28,710 --> 00:22:26,799
failure occurred it could cause

573
00:22:31,510 --> 00:22:28,720
damage perhaps even catastrophic damage

574
00:22:33,510 --> 00:22:31,520
to the iss spacex said we understand and

575
00:22:34,470 --> 00:22:33,520
we'll make a modification so spacex

576
00:22:36,230 --> 00:22:34,480
actually went out and made a

577
00:22:38,310 --> 00:22:36,240
modification to their vehicle between

578
00:22:39,990 --> 00:22:38,320
demo one and demo two so it's really

579
00:22:42,870 --> 00:22:40,000
some of all those things great

580
00:22:44,710 --> 00:22:42,880
communication with our russian partners

581
00:22:48,230 --> 00:22:44,720
an outstanding effort on behalf of

582
00:22:50,549 --> 00:22:48,240
spacex to to close that gap um and and

583
00:22:53,110 --> 00:22:50,559
then the the trust that we've built over

584
00:22:55,510 --> 00:22:53,120
the uh over the years to get us today so

585
00:22:59,830 --> 00:22:55,520
cosmos participated and they were go and

586
00:23:03,510 --> 00:23:01,350
and our next question is from stephen

587
00:23:06,070 --> 00:23:03,520
clark from space flight now

588
00:23:10,390 --> 00:23:08,230

hi thank you for taking my question i

589
00:23:11,590 --> 00:23:10,400
had a question i guess for cassie

590
00:23:13,750 --> 00:23:11,600
leaders maybe

591
00:23:16,390 --> 00:23:13,760
um i i know the commercial crew program

592
00:23:17,990 --> 00:23:16,400
requirement for the loss of crew risk is

593
00:23:20,230 --> 00:23:18,000
one in 270.

594
00:23:21,669 --> 00:23:20,240
i know there's a

595
00:23:23,270 --> 00:23:21,679
reason not to look too hard at these

596
00:23:24,630 --> 00:23:23,280
numbers but that as i understand was a

597
00:23:27,350 --> 00:23:24,640
requirement for the commercial crew

598
00:23:28,870 --> 00:23:27,360
program just curious uh

599
00:23:31,190 --> 00:23:28,880
where you ended up in the loss of crew

600
00:23:33,830 --> 00:23:31,200
number for this mission and what

601
00:23:36,710 --> 00:23:33,840
mitigations uh operationally

602
00:23:39,029 --> 00:23:36,720
uh or physically on the spacecraft uh

603
00:23:41,510 --> 00:23:39,039
you had to do in recent months or recent

604
00:23:44,470 --> 00:23:41,520
uh last year or two to get to that

605
00:23:48,149 --> 00:23:44,480
uh one in 270 requirement thanks

606
00:23:50,470 --> 00:23:48,159
so we actually um between the spacex and

607
00:23:51,750 --> 00:23:50,480
operational controls we actually were

608
00:23:53,029 --> 00:23:51,760
meeting our one and two seventy

609
00:23:55,510 --> 00:23:53,039
requirement

610
00:23:57,269 --> 00:23:55,520
um for and it's not just a mission it's

611
00:23:58,470 --> 00:23:57,279
really it's an overall certification

612
00:24:00,390 --> 00:23:58,480
requirement

613
00:24:02,710 --> 00:24:00,400

so um

614
00:24:04,549 --> 00:24:02,720
and so uh

615
00:24:06,630 --> 00:24:04,559
with with all the work that we've been

616
00:24:08,950 --> 00:24:06,640
doing with spacex on the modeling on the

617
00:24:09,830 --> 00:24:08,960
different aspects of their design

618
00:24:16,990 --> 00:24:09,840
and

619
00:24:31,190 --> 00:24:17,000
that requirement was closed out

620
00:24:34,549 --> 00:24:33,190
if i might available for steve i'm just

621
00:24:35,990 --> 00:24:34,559
curious for those of us who haven't

622
00:24:38,230 --> 00:24:36,000
participated in a flight readiness

623
00:24:41,269 --> 00:24:38,240
review can you give us like a tangible

624
00:24:43,190 --> 00:24:41,279
example of uh you know the kind of back

625
00:24:45,029 --> 00:24:43,200
and forth that might happen in that room

626
00:24:47,750 --> 00:24:45,039
and you know does it get down to the

627
00:24:50,390 --> 00:24:47,760
engineers on a specific sub component

628
00:24:52,070 --> 00:24:50,400
area or is it at a more high level uh

629
00:24:53,990 --> 00:24:52,080
and for benji i'm just curious i know

630
00:24:55,990 --> 00:24:54,000
it's hard to put an exact number on this

631
00:24:57,830 --> 00:24:56,000
but can you talk about how spacex is

632
00:25:02,549 --> 00:24:57,840
invested in developing the crew dragon

633
00:25:06,870 --> 00:25:04,549
so um you know

634
00:25:10,870 --> 00:25:06,880
a big part of a flight readiness review

635
00:25:12,630 --> 00:25:10,880
is reviewing accepting risk the risks

636
00:25:15,510 --> 00:25:12,640
whenever we fly

637
00:25:18,149 --> 00:25:15,520
there are going to be residual risks

638
00:25:21,029 --> 00:25:18,159

the t kathy and benji and their team did

639
00:25:24,310 --> 00:25:21,039
a great job along the way in these many

640
00:25:25,909 --> 00:25:24,320
years of identifying risks

641
00:25:28,070 --> 00:25:25,919
understanding them

642
00:25:30,070 --> 00:25:28,080
mitigating them through design changes

643
00:25:31,909 --> 00:25:30,080
and operational controls

644
00:25:33,830 --> 00:25:31,919
to the point where we were able to

645
00:25:36,630 --> 00:25:33,840
accept a lot of them

646
00:25:38,230 --> 00:25:36,640
most of them along the way

647
00:25:41,350 --> 00:25:38,240
so an example of

648
00:25:42,950 --> 00:25:41,360
of one that we've been

649
00:25:45,430 --> 00:25:42,960
that the team has been working on over

650
00:25:47,590 --> 00:25:45,440
the last six months or so were the drag

651
00:25:49,430 --> 00:25:47,600
dragon parachutes

652
00:25:51,269 --> 00:25:49,440
so we

653
00:25:53,750 --> 00:25:51,279
established

654
00:25:55,510 --> 00:25:53,760
a little while ago that the original

655
00:25:57,590 --> 00:25:55,520
shoot designs did not have adequate

656
00:25:59,430 --> 00:25:57,600
margin based on some knowledge we had

657
00:26:00,950 --> 00:25:59,440
gained through testing about how the

658
00:26:03,350 --> 00:26:00,960
shoots deploy and the loading on the

659
00:26:05,590 --> 00:26:03,360
shoots so spacex stepped up and did a

660
00:26:07,750 --> 00:26:05,600
new shoot design

661
00:26:08,789 --> 00:26:07,760
and we had to qualify that new shoot

662
00:26:10,230 --> 00:26:08,799
design

663
00:26:12,549 --> 00:26:10,240

to higher

664
00:26:13,830 --> 00:26:12,559
margins than we had pre the previous

665
00:26:16,149 --> 00:26:13,840
shoots

666
00:26:18,310 --> 00:26:16,159
the nasa spacex team did an amazing job

667
00:26:21,350 --> 00:26:18,320
laying out a test program

668
00:26:22,549 --> 00:26:21,360
and executing that test program

669
00:26:25,350 --> 00:26:22,559
however

670
00:26:28,789 --> 00:26:25,360
it's fewer tests than we normally would

671
00:26:29,669 --> 00:26:28,799
see on a parachute qualification program

672
00:26:30,789 --> 00:26:29,679
so

673
00:26:33,269 --> 00:26:30,799
we took

674
00:26:35,269 --> 00:26:33,279
a long time in a couple of presentations

675
00:26:37,430 --> 00:26:35,279
during the review to have the team walk

676
00:26:40,070 --> 00:26:37,440
us through the design

677
00:26:42,549 --> 00:26:40,080
um the changes

678
00:26:44,710 --> 00:26:42,559
the qualification testing and

679
00:26:47,990 --> 00:26:44,720
and the margins on the shoot to make

680
00:26:50,470 --> 00:26:48,000
sure that everybody was good with how

681
00:26:52,950 --> 00:26:50,480
those shoots were qualified and we had

682
00:26:55,430 --> 00:26:52,960
very high confidence that they will

683
00:26:57,590 --> 00:26:55,440
function as we need them to

684
00:27:00,710 --> 00:26:57,600
when bob and doug return from the

685
00:27:04,830 --> 00:27:02,149
and our next question is from eric

686
00:27:06,390 --> 00:27:04,840
berger arts technica

687
00:27:08,470 --> 00:27:06,400
eric

688
00:27:10,549 --> 00:27:08,480

hi hi good afternoon everyone thank you

689
00:27:12,070 --> 00:27:10,559
for doing this i guess the question

690
00:27:13,510 --> 00:27:12,080
maybe for kathy

691
00:27:15,350 --> 00:27:13,520
you know it's been a little more than a

692
00:27:17,750 --> 00:27:15,360
year ago when there was the accident

693
00:27:19,909 --> 00:27:17,760
when they were testing the um

694
00:27:21,909 --> 00:27:19,919
the super drago thrusters and it was a

695
00:27:24,710 --> 00:27:21,919
pretty pretty visceral image visceral

696
00:27:26,710 --> 00:27:24,720
image of what happened on the pad there

697
00:27:29,029 --> 00:27:26,720
and at the test pad and i'm just

698
00:27:31,269 --> 00:27:29,039
wondering did you think

699
00:27:32,870 --> 00:27:31,279
we would get here a year later to where

700
00:27:35,430 --> 00:27:32,880
we're ready to launch crew now after

701
00:27:36,870 --> 00:27:35,440
that accident

702
00:27:38,870 --> 00:27:36,880
well i've been doing this for a really

703
00:27:40,870 --> 00:27:38,880
long time i told somebody i'm like i

704
00:27:44,389 --> 00:27:40,880
feel like an old lady now after kind of

705
00:27:46,710 --> 00:27:44,399
working vehicle development now for

706
00:27:49,029 --> 00:27:46,720
14 years and and

707
00:27:50,389 --> 00:27:49,039
don't ever underestimate the value of a

708
00:27:52,710 --> 00:27:50,399
failure

709
00:27:55,909 --> 00:27:52,720
right i've learned that

710
00:27:59,350 --> 00:27:55,919
when i look at over my career when we've

711
00:28:03,510 --> 00:28:01,190
progress that's been

712
00:28:05,830 --> 00:28:03,520
in learning from a failure and then

713
00:28:08,389 --> 00:28:05,840

using that as a step function

714
00:28:10,630 --> 00:28:08,399
to move you to the next level

715
00:28:14,230 --> 00:28:10,640
so but you also

716
00:28:18,070 --> 00:28:15,590
underestimate

717
00:28:18,870 --> 00:28:18,080
how much work it is for you to overcome

718
00:28:21,990 --> 00:28:18,880
it

719
00:28:23,510 --> 00:28:22,000
right so um we always had a plan we had

720
00:28:25,190 --> 00:28:23,520
a plan actually we had a plan that we

721
00:28:26,710 --> 00:28:25,200
were trying to fly you know potentially

722
00:28:28,710 --> 00:28:26,720
by the end of

723
00:28:30,710 --> 00:28:28,720
december but we weren't going to fly

724
00:28:32,389 --> 00:28:30,720
until we're ready until we worked

725
00:28:33,669 --> 00:28:32,399
through all the testing and everything

726
00:28:35,430 --> 00:28:33,679
we needed

727
00:28:38,630 --> 00:28:35,440
so

728
00:28:40,470 --> 00:28:38,640
i i look back on last april and the

729
00:28:42,870 --> 00:28:40,480
static fire was really for us to get

730
00:28:44,789 --> 00:28:42,880
ready for our in-flight abort test that

731
00:28:47,269 --> 00:28:44,799
was supposed to happen in june

732
00:28:50,710 --> 00:28:47,279
and i think that was a real blessing for

733
00:28:52,230 --> 00:28:50,720
us we learned a ton about our system

734
00:28:56,830 --> 00:28:52,240
and

735
00:29:00,389 --> 00:28:56,840
knowledge of

736
00:29:03,190 --> 00:29:00,399
materials and nto systems

737
00:29:07,990 --> 00:29:03,200
to an extent that give us

738
00:29:12,789 --> 00:29:09,110

you know

739
00:29:14,950 --> 00:29:12,799
understanding of our systems and further

740
00:29:16,230 --> 00:29:14,960
robustness of the new design that we

741
00:29:18,470 --> 00:29:16,240
have so

742
00:29:20,149 --> 00:29:18,480
um

743
00:29:22,070 --> 00:29:20,159
last april i probably wasn't thinking i

744
00:29:23,830 --> 00:29:22,080
was going to be flying in a year but you

745
00:29:27,110 --> 00:29:23,840
know what you can never

746
00:29:29,190 --> 00:29:27,120
you can never sell this nasa and spacex

747
00:29:31,269 --> 00:29:29,200
team short and they've always

748
00:29:34,950 --> 00:29:31,279
accomplished miracles for me and i'm

749
00:29:39,029 --> 00:29:36,789
thank you kathy and i think i skipped

750
00:29:41,430 --> 00:29:39,039
over one question for benji

751
00:29:42,310 --> 00:29:41,440
about how spacex has contributed benji

752
00:29:45,590 --> 00:29:42,320
you want to answer that question from

753
00:29:47,990 --> 00:29:45,600
tim fernands great sure absolutely um

754
00:29:48,950 --> 00:29:48,000
so i can't you know give you the exact

755
00:29:51,110 --> 00:29:48,960
dollar amount there's you know

756
00:29:52,630 --> 00:29:51,120
proprietary and competitive reasons why

757
00:29:54,710 --> 00:29:52,640
um we can't but i can tell you

758
00:29:57,590 --> 00:29:54,720
absolutely that spacex has invested

759
00:29:59,909 --> 00:29:57,600
heavily um into this partnership and

760
00:30:02,070 --> 00:29:59,919
into the development of you know dragon

761
00:30:03,269 --> 00:30:02,080
and falcon if you go all the way back to

762
00:30:05,430 --> 00:30:03,279
the days when you know we were

763
00:30:07,590 --> 00:30:05,440

developing our falcon 1 vehicle you know

764
00:30:09,669 --> 00:30:07,600
it's the the fundamental systems and

765
00:30:12,149 --> 00:30:09,679
processes and even a lot of the the

766
00:30:13,990 --> 00:30:12,159
development of the engineers and team

767
00:30:15,990 --> 00:30:14,000
that that created falcon 1 are still

768
00:30:17,350 --> 00:30:16,000
working on the program today

769
00:30:18,870 --> 00:30:17,360
and then you can you fast forward and

770
00:30:22,149 --> 00:30:18,880
you look at the development of falcon 9

771
00:30:23,990 --> 00:30:22,159
and dragon again in partnership um with

772
00:30:25,590 --> 00:30:24,000
uh with with nasa

773
00:30:27,350 --> 00:30:25,600
under the cots program and the cargo

774
00:30:30,070 --> 00:30:27,360
programs and then continuing through now

775
00:30:31,669 --> 00:30:30,080
to the crew dragon um the partnership is

776
00:30:34,149 --> 00:30:31,679
is definitely a two-way street and we

777
00:30:36,950 --> 00:30:34,159
put a lot of time and energy and

778
00:30:38,630 --> 00:30:36,960
and finance into that effort

779
00:30:40,870 --> 00:30:38,640
um to ensure that you know we're ready

780
00:30:41,830 --> 00:30:40,880
to fly as we will be in you know in five

781
00:30:43,990 --> 00:30:41,840
days

782
00:30:45,510 --> 00:30:44,000
um a lot of what you should look at is

783
00:30:46,950 --> 00:30:45,520
you see the the workforce that we've

784
00:30:49,430 --> 00:30:46,960
developed you see the technologies that

785
00:30:51,190 --> 00:30:49,440
we've developed um to ensure that um

786
00:30:53,269 --> 00:30:51,200
that we're ready to fly

787
00:30:55,669 --> 00:30:53,279
um another element to i think it's

788
00:30:57,750 --> 00:30:55,679

important to pay attention to is is you

789
00:30:59,190 --> 00:30:57,760
know kind of the the i won't say

790
00:31:01,029 --> 00:30:59,200
pioneering because we're the first to do

791
00:31:03,350 --> 00:31:01,039
firm fixed price contracting but i think

792
00:31:05,750 --> 00:31:03,360
it's it's you know we've been uh

793
00:31:08,549 --> 00:31:05,760
champions is a good word of firm fixed

794
00:31:10,070 --> 00:31:08,559
price contracting um from the beginning

795
00:31:12,149 --> 00:31:10,080
you know fundamentally this is about

796
00:31:14,310 --> 00:31:12,159
saying to the taxpayer hey there's

797
00:31:15,830 --> 00:31:14,320
something you want us to do um here's

798
00:31:17,110 --> 00:31:15,840
how much we're gonna charge for it and

799
00:31:19,750 --> 00:31:17,120
we're gonna go do it for that amount of

800
00:31:21,350 --> 00:31:19,760
money and that's uh that's uh

801
00:31:22,950 --> 00:31:21,360
in some ways i think it used to be a

802
00:31:24,230 --> 00:31:22,960
pretty revolutionary concept and i think

803
00:31:25,590 --> 00:31:24,240
we've shown that that is a very

804
00:31:27,669 --> 00:31:25,600
effective tool

805
00:31:29,110 --> 00:31:27,679
for um getting the best value to the

806
00:31:31,269 --> 00:31:29,120
government to nasa to the to the

807
00:31:33,029 --> 00:31:31,279
american taxpayer

808
00:31:35,509 --> 00:31:33,039
and and as you know this recently

809
00:31:38,230 --> 00:31:35,519
reported um you know estimated that that

810
00:31:40,149 --> 00:31:38,240
this program overall will have saved um

811
00:31:41,909 --> 00:31:40,159
nasa you know maybe 30 to 40 billion

812
00:31:43,669 --> 00:31:41,919
dollars at least

813
00:31:45,350 --> 00:31:43,679

and that's uh that's a significant thing

814
00:31:47,190 --> 00:31:45,360
to think about and see how that how we

815
00:31:48,710 --> 00:31:47,200
continue you know again those firm fixed

816
00:31:50,070 --> 00:31:48,720
price contracts and the kind of

817
00:31:52,149 --> 00:31:50,080
partnership and

818
00:31:54,470 --> 00:31:52,159
truly open partnership where we work

819
00:31:56,070 --> 00:31:54,480
together allows that kind of savings to

820
00:31:58,070 --> 00:31:56,080
happen and that kind of

821
00:31:59,190 --> 00:31:58,080
ability for nasa to invest in more

822
00:32:03,190 --> 00:31:59,200
things

823
00:32:07,909 --> 00:32:05,110
our next question is from lauren grush

824
00:32:10,470 --> 00:32:07,919
at the verge lauren

825
00:32:12,870 --> 00:32:10,480
hi thanks for doing this i was wondering

826
00:32:15,590 --> 00:32:12,880
if you could go through all the possible

827
00:32:17,350 --> 00:32:15,600
abort scenarios for this play flight you

828
00:32:19,430 --> 00:32:17,360
know at which points are the aborts

829
00:32:21,350 --> 00:32:19,440
available and how does that put

830
00:32:23,269 --> 00:32:21,360
constraints on when you can launch

831
00:32:25,029 --> 00:32:23,279
notably whether you know how big of an

832
00:32:26,830 --> 00:32:25,039
area do you need to consider on launch

833
00:32:29,430 --> 00:32:26,840
day

834
00:32:30,710 --> 00:32:29,440
thanks sure i'll i'll talk a little

835
00:32:32,149 --> 00:32:30,720
about that and then norm if you wanted

836
00:32:33,029 --> 00:32:32,159
to add anything to it as well but i

837
00:32:35,110 --> 00:32:33,039
think that

838
00:32:36,549 --> 00:32:35,120

the um you know uh

839
00:32:37,830 --> 00:32:36,559
number one um one of the key

840
00:32:39,909 --> 00:32:37,840
requirements of this program is to have

841
00:32:42,310 --> 00:32:39,919
a have an abort system and we want to

842
00:32:44,149 --> 00:32:42,320
develop our our vehicle to have this you

843
00:32:45,990 --> 00:32:44,159
know integrated abort system uh what we

844
00:32:48,149 --> 00:32:46,000
call the launch escape system um those

845
00:32:50,630 --> 00:32:48,159
are the super dracos

846
00:32:53,509 --> 00:32:50,640
on the vehicle the super draco engines

847
00:32:54,470 --> 00:32:53,519
and um and it's a it's a very effective

848
00:32:56,230 --> 00:32:54,480
system

849
00:32:58,710 --> 00:32:56,240
that we hope we never ever ever have to

850
00:33:01,669 --> 00:32:58,720
use um it's sort of like the airbags in

851
00:33:03,669 --> 00:33:01,679
your car the ejection seat and a jet um

852
00:33:05,029 --> 00:33:03,679
plane you know you you have you put a

853
00:33:06,389 --> 00:33:05,039
lot into it you test it and you make

854
00:33:08,789 --> 00:33:06,399
sure it's going to work and then you

855
00:33:11,830 --> 00:33:08,799
hope you never ever have to use it um

856
00:33:14,389 --> 00:33:11,840
you know in uh 2015 we did our pad abort

857
00:33:16,389 --> 00:33:14,399
test um to demonstrate that that we

858
00:33:18,710 --> 00:33:16,399
could escape from the pad and into the

859
00:33:21,269 --> 00:33:18,720
water um bring them uh come down safely

860
00:33:22,710 --> 00:33:21,279
into the water with the astronauts um

861
00:33:25,509 --> 00:33:22,720
and then again in january of this year

862
00:33:28,310 --> 00:33:25,519
we did the in-flight abort test um

863
00:33:30,470 --> 00:33:28,320

launched on falcon 9 and uh and

864
00:33:32,789 --> 00:33:30,480
initiated the launch escape system um

865
00:33:35,430 --> 00:33:32,799
mid-flight um and some of the the

866
00:33:37,509 --> 00:33:35,440
roughest moments of the of the launch

867
00:33:39,990 --> 00:33:37,519
and demonstrated again that that launch

868
00:33:42,070 --> 00:33:40,000
escape system can bring um the vehicle

869
00:33:43,669 --> 00:33:42,080
down and bring the crew home safely

870
00:33:46,070 --> 00:33:43,679
to the water and then be able to be

871
00:33:47,509 --> 00:33:46,080
recovered

872
00:33:48,789 --> 00:33:47,519
you ask the question about when is it

873
00:33:51,269 --> 00:33:48,799
available it's really available almost

874
00:33:53,029 --> 00:33:51,279
the entire time one of the goals of this

875
00:33:55,190 --> 00:33:53,039
of the system is to not have any

876
00:33:57,190 --> 00:33:55,200
blackout periods where you really can't

877
00:33:59,430 --> 00:33:57,200
um where that system doesn't doesn't

878
00:34:02,470 --> 00:33:59,440
function um you know and that's that's a

879
00:34:04,230 --> 00:34:02,480
big step in the history the evolution

880
00:34:05,990 --> 00:34:04,240
of using these systems

881
00:34:08,149 --> 00:34:06,000
um and a good example of that you know a

882
00:34:09,990 --> 00:34:08,159
little while back um

883
00:34:11,750 --> 00:34:10,000
on one of the soyuz launches they they

884
00:34:13,750 --> 00:34:11,760
they needed to use the the launch escape

885
00:34:16,230 --> 00:34:13,760
system and it worked great and that was

886
00:34:17,909 --> 00:34:16,240
um but the the uh part of flight where

887
00:34:19,430 --> 00:34:17,919
they needed to use it was actually

888
00:34:21,349 --> 00:34:19,440

something that they had been expanding

889
00:34:23,349 --> 00:34:21,359
into so over time they had continued to

890
00:34:24,950 --> 00:34:23,359
improve that system

891
00:34:26,470 --> 00:34:24,960
in the same way that that you know we've

892
00:34:28,310 --> 00:34:26,480
been charged to do the same thing on our

893
00:34:30,230 --> 00:34:28,320
system to ensure that

894
00:34:31,589 --> 00:34:30,240
you know you can cover all of the path

895
00:34:33,109 --> 00:34:31,599
of flight

896
00:34:34,470 --> 00:34:33,119
you asked about whether and what we need

897
00:34:36,470 --> 00:34:34,480
to might look for and that's a really

898
00:34:37,589 --> 00:34:36,480
important point and i didn't mention it

899
00:34:39,430 --> 00:34:37,599
earlier but i think it's important to

900
00:34:41,270 --> 00:34:39,440
talk about weather

901
00:34:42,149 --> 00:34:41,280
on you know coming up here for launch

902
00:34:46,550 --> 00:34:42,159
day

903
00:34:48,310 --> 00:34:46,560
you know we're always monitoring a lot

904
00:34:49,589 --> 00:34:48,320
of things and and it does have very much

905
00:34:51,990 --> 00:34:49,599
to do with the launch support system on

906
00:34:54,069 --> 00:34:52,000
dragon 2. so when we're normally flying

907
00:34:56,470 --> 00:34:54,079
a falcon mission say with a satellite

908
00:34:57,750 --> 00:34:56,480
fairing mission um we're monitoring a

909
00:34:59,270 --> 00:34:57,760
lot of different things we're looking at

910
00:35:00,470 --> 00:34:59,280
ground winds we're looking at lightning

911
00:35:01,990 --> 00:35:00,480
we're looking at upper atmosphere winds

912
00:35:04,630 --> 00:35:02,000
wins

913
00:35:06,150 --> 00:35:04,640

along the ascent trajectory

914
00:35:07,829 --> 00:35:06,160
but you know it's it's it's focused

915
00:35:09,910 --> 00:35:07,839
particularly on the falcon and we'll be

916
00:35:12,790 --> 00:35:09,920
looking at all of those um and the same

917
00:35:14,790 --> 00:35:12,800
kind of thresholds um to uh to call off

918
00:35:16,550 --> 00:35:14,800
the launch um for falcon we'll do that

919
00:35:19,270 --> 00:35:16,560
the same for the crew missions but now

920
00:35:21,190 --> 00:35:19,280
we need to add into that all of the

921
00:35:23,510 --> 00:35:21,200
uh the all of the weather along the

922
00:35:26,470 --> 00:35:23,520
entire ascent track where we might need

923
00:35:27,829 --> 00:35:26,480
to escape the crew abort the crew off of

924
00:35:30,870 --> 00:35:27,839
falcon

925
00:35:32,550 --> 00:35:30,880
and it's really there's 50 points

926
00:35:35,430 --> 00:35:32,560
where we're monitoring weather over 50

927
00:35:36,870 --> 00:35:35,440
points actually we're monitoring weather

928
00:35:39,349 --> 00:35:36,880
all the way along this interact which

929
00:35:40,950 --> 00:35:39,359
means from from the from here in florida

930
00:35:43,270 --> 00:35:40,960
all the way up the eastern seaboard of

931
00:35:44,950 --> 00:35:43,280
the of north america united states and

932
00:35:46,950 --> 00:35:44,960
canada and all the way over basically to

933
00:35:49,270 --> 00:35:46,960
ireland across the northern atlantic

934
00:35:50,790 --> 00:35:49,280
we're monitoring that weather

935
00:35:52,230 --> 00:35:50,800
and along that way we're monitoring a

936
00:35:53,670 --> 00:35:52,240
lot of the same things we're looking at

937
00:35:55,589 --> 00:35:53,680
winds we're looking at lightning we're

938
00:35:57,270 --> 00:35:55,599

looking at precipitation we're actually

939
00:35:59,430 --> 00:35:57,280
looking at waves we're looking at wave

940
00:36:00,710 --> 00:35:59,440
velocity and wave height

941
00:36:02,390 --> 00:36:00,720
because we need to make sure that if the

942
00:36:04,230 --> 00:36:02,400
crew had to come down

943
00:36:05,589 --> 00:36:04,240
in a launch escape scenario that they

944
00:36:07,430 --> 00:36:05,599
would come down in a sea state that

945
00:36:08,550 --> 00:36:07,440
would keep them safe and that the rescue

946
00:36:10,710 --> 00:36:08,560
forces would be able to come and get

947
00:36:13,430 --> 00:36:10,720
them again we hope we never have to use

948
00:36:15,510 --> 00:36:13,440
that but we're monitoring all of those

949
00:36:16,950 --> 00:36:15,520
parameters as we go along

950
00:36:20,150 --> 00:36:16,960
and we don't launch until we know that

951
00:36:37,030 --> 00:36:21,750
next question is from leo enright at

952
00:36:40,230 --> 00:36:38,390
all right and it looks like we lost that

953
00:36:42,230 --> 00:36:40,240
connection so we'll go to irene klotz at

954
00:36:44,310 --> 00:36:42,240
aviation week irene

955
00:36:45,270 --> 00:36:44,320
thanks josh uh my questions for benji

956
00:36:47,030 --> 00:36:45,280
reed

957
00:36:49,190 --> 00:36:47,040
given what you've learned working with

958
00:36:51,109 --> 00:36:49,200
nasa on commercial crew for all these

959
00:36:53,109 --> 00:36:51,119
years how much faster do you think

960
00:36:57,270 --> 00:36:53,119
spacex can get to crew flight with

961
00:37:01,109 --> 00:36:59,190
that's a great question um although i

962
00:37:03,910 --> 00:37:01,119
have to say that our focus today of

963
00:37:05,190 --> 00:37:03,920

course is on demo 2 um and my focus

964
00:37:07,990 --> 00:37:05,200
particularly has been on the commercial

965
00:37:10,230 --> 00:37:08,000
crew program super excited as we develop

966
00:37:12,390 --> 00:37:10,240
um starship and and develop that in

967
00:37:13,670 --> 00:37:12,400
partnership with nasa in um in the

968
00:37:15,430 --> 00:37:13,680
contracts that we're already working the

969
00:37:18,790 --> 00:37:15,440
programs are already working with them

970
00:37:20,069 --> 00:37:18,800
um again it's a process um and i would

971
00:37:22,550 --> 00:37:20,079
say though that you know just looking at

972
00:37:24,950 --> 00:37:22,560
the development of the nasa spacex

973
00:37:27,510 --> 00:37:24,960
partnership from the cargo days um now

974
00:37:29,510 --> 00:37:27,520
through the crew days you know the

975
00:37:31,750 --> 00:37:29,520
having worked together and understood

976
00:37:33,510 --> 00:37:31,760
each other and influenced each other

977
00:37:34,310 --> 00:37:33,520
you know we've learned a lot from nasa

978
00:37:46,630 --> 00:37:34,320
and

979
00:37:47,990 --> 00:37:46,640
every time you do this together it's

980
00:37:50,790 --> 00:37:48,000
gonna get better we'll get more

981
00:37:52,150 --> 00:37:50,800
efficient and and do better and um you

982
00:37:53,190 --> 00:37:52,160
know we were just i was just chatting

983
00:37:55,589 --> 00:37:53,200
with um

984
00:37:57,510 --> 00:37:55,599
uh the uh the director of marshall's uh

985
00:37:58,630 --> 00:37:57,520
center and um you know talking about you

986
00:38:00,790 --> 00:37:58,640
know some of the new programs we'll be

987
00:38:02,710 --> 00:38:00,800
working on with them there too um for

988
00:38:04,390 --> 00:38:02,720

starship and we're excited we're excited

989
00:38:06,630 --> 00:38:04,400
to continue that partnership and make it

990
00:38:10,790 --> 00:38:06,640
work better and more efficient and

991
00:38:16,550 --> 00:38:12,430
and our next question is from mike

992
00:38:20,069 --> 00:38:18,630
thank you all um yeah this this is a

993
00:38:22,550 --> 00:38:20,079
question about kind of what like what

994
00:38:24,310 --> 00:38:22,560
the next steps are going forward up like

995
00:38:26,310 --> 00:38:24,320
between now and and actually launch day

996
00:38:27,829 --> 00:38:26,320
i'm just mostly curious about

997
00:38:29,030 --> 00:38:27,839
like what when you need to kind of kick

998
00:38:31,190 --> 00:38:29,040
off on

999
00:38:33,109 --> 00:38:31,200
like during the review this this like

1000
00:38:35,030 --> 00:38:33,119
coming monday that that you guys didn't

1001
00:38:36,710 --> 00:38:35,040
talk about during yeah during the flight

1002
00:38:37,430 --> 00:38:36,720
readiness review so so that's probably

1003
00:38:39,430 --> 00:38:37,440
for

1004
00:38:41,270 --> 00:38:39,440
if i guess benji like what like what's

1005
00:38:42,390 --> 00:38:41,280
monday's review going to look like and

1006
00:38:45,270 --> 00:38:42,400
how it's going to be different from

1007
00:38:47,270 --> 00:38:45,280
what's already been discussed

1008
00:38:50,230 --> 00:38:47,280
launch readiness review is is ultimately

1009
00:38:52,630 --> 00:38:50,240
the the final check to make sure that

1010
00:38:54,230 --> 00:38:52,640
that everything that that was open any

1011
00:38:56,870 --> 00:38:54,240
open issues or concerns that those have

1012
00:38:58,390 --> 00:38:56,880
been answered anything new that we that

1013
00:39:00,470 --> 00:38:58,400

we may have discovered again has been

1014
00:39:02,150 --> 00:39:00,480
open has been closed and answered

1015
00:39:03,510 --> 00:39:02,160
but particularly it's really an

1016
00:39:04,790 --> 00:39:03,520
assessment of the data right we'll have

1017
00:39:06,310 --> 00:39:04,800
done our our

1018
00:39:08,550 --> 00:39:06,320
static fire that we're doing here

1019
00:39:10,390 --> 00:39:08,560
shortly this afternoon

1020
00:39:12,230 --> 00:39:10,400
it will have done our wet dress or i'm

1021
00:39:13,589 --> 00:39:12,240
sorry a dry dress rehearsal with the

1022
00:39:15,910 --> 00:39:13,599
crew

1023
00:39:17,190 --> 00:39:15,920
and that's a ton of data really really

1024
00:39:18,870 --> 00:39:17,200
important that all of our engineers

1025
00:39:20,870 --> 00:39:18,880
they're all on deck and ready to go

1026
00:39:22,069 --> 00:39:20,880
right now and for the next few days

1027
00:39:23,589 --> 00:39:22,079
through the weekend they will be

1028
00:39:25,750 --> 00:39:23,599
analyzing and look at all the data and

1029
00:39:28,069 --> 00:39:25,760
all the observations that are made

1030
00:39:30,069 --> 00:39:28,079
and launch readiness reviews to go again

1031
00:39:33,030 --> 00:39:30,079
across all of the teams and every person

1032
00:39:34,870 --> 00:39:33,040
and say are you ready what did you learn

1033
00:39:37,990 --> 00:39:34,880
what came out of the data are we ready

1034
00:39:41,349 --> 00:39:39,670
and our next question is from emory

1035
00:39:42,950 --> 00:39:41,359
kelly florida today

1036
00:39:44,470 --> 00:39:42,960
emery

1037
00:39:47,109 --> 00:39:44,480
hey folks thanks for thanks for doing

1038
00:39:49,430 --> 00:39:47,119

this i i appreciate it um administrator

1039
00:39:51,990 --> 00:39:49,440
bridenstine mentioned you know over the

1040
00:39:54,069 --> 00:39:52,000
course of the past two days folks could

1041
00:39:54,710 --> 00:39:54,079
to speak up if if they had any questions

1042
00:39:58,390 --> 00:39:54,720
and

1043
00:40:00,470 --> 00:39:58,400
um

1044
00:40:03,030 --> 00:40:00,480
discussion between between the russians

1045
00:40:04,230 --> 00:40:03,040
uh and the issue resolved between demo

1046
00:40:06,150 --> 00:40:04,240
one and demo two and i know you

1047
00:40:07,829 --> 00:40:06,160
discussed parachutes i'm curious if

1048
00:40:08,630 --> 00:40:07,839
there was anything else that that came

1049
00:40:11,349 --> 00:40:08,640
up

1050
00:40:13,589 --> 00:40:11,359
uh yesterday and today that that maybe

1051
00:40:18,150 --> 00:40:13,599
led to some longer discussions that that

1052
00:40:24,550 --> 00:40:21,349
yeah so the other two um kind of

1053
00:40:27,109 --> 00:40:24,560
technical special topics we had

1054
00:40:30,230 --> 00:40:27,119
what was the nto

1055
00:40:31,750 --> 00:40:30,240
titanium compatibility issue

1056
00:40:33,430 --> 00:40:31,760
that was discovered

1057
00:40:36,390 --> 00:40:33,440
during the dragon

1058
00:40:39,750 --> 00:40:36,400
hot fire test back in april

1059
00:40:40,790 --> 00:40:39,760
i also a tremendous amount of um work

1060
00:40:44,630 --> 00:40:40,800
done by

1061
00:40:46,470 --> 00:40:44,640
the nasa spacex team to understand that

1062
00:40:48,150 --> 00:40:46,480
and to figure out how to mitigate and

1063
00:40:49,910 --> 00:40:48,160

control that

1064
00:40:51,670 --> 00:40:49,920
hazard and

1065
00:40:53,030 --> 00:40:51,680
a lot of a lot of questions to just

1066
00:40:55,270 --> 00:40:53,040
understand

1067
00:40:56,390 --> 00:40:55,280
where we were and make sure that we were

1068
00:40:59,190 --> 00:40:56,400
ready to

1069
00:41:02,390 --> 00:40:59,200
accept that risk the residual risk there

1070
00:41:04,069 --> 00:41:02,400
for the demo 2 flight which we are

1071
00:41:07,430 --> 00:41:04,079
again i cannot tell you the amount of

1072
00:41:09,190 --> 00:41:07,440
testing that was done by the white sands

1073
00:41:11,589 --> 00:41:09,200
test facility team

1074
00:41:12,710 --> 00:41:11,599
and the spacex team and mcgregor

1075
00:41:15,030 --> 00:41:12,720
particularly the spacex team and

1076
00:41:17,589 --> 00:41:15,040
mcgregor over the past few weeks this

1077
00:41:19,430 --> 00:41:17,599
has done a tremendous amount of testing

1078
00:41:20,390 --> 00:41:19,440
and that testing gives us confidence

1079
00:41:29,910 --> 00:41:20,400
that

1080
00:41:31,990 --> 00:41:29,920
another one was a

1081
00:41:33,829 --> 00:41:32,000
more late breaking

1082
00:41:35,990 --> 00:41:33,839
issue late breaking within the next

1083
00:41:38,870 --> 00:41:36,000
month or so not days but late

1084
00:41:40,870 --> 00:41:38,880
um on a performance shortfall of the

1085
00:41:43,990 --> 00:41:40,880
fire suppression system

1086
00:41:46,550 --> 00:41:44,000
um so the team that's a system that um

1087
00:41:49,270 --> 00:41:46,560
suppresses any fire underneath

1088
00:41:51,109 --> 00:41:49,280

any equipment or anything on the floor

1089
00:41:54,309 --> 00:41:51,119
of dragon underneath the floor of dragon

1090
00:41:57,109 --> 00:41:54,319
and um so the team again analyzed both

1091
00:41:59,910 --> 00:41:57,119
the hazards there as well as the ability

1092
00:42:01,109 --> 00:41:59,920
of the system to suppress a fire

1093
00:42:03,670 --> 00:42:01,119
and

1094
00:42:04,630 --> 00:42:03,680
the we've deemed the risk to be very low

1095
00:42:06,550 --> 00:42:04,640
there

1096
00:42:08,069 --> 00:42:06,560
and so we were able to review that data

1097
00:42:10,309 --> 00:42:08,079
and that great work done by the team and

1098
00:42:12,470 --> 00:42:10,319
accept that risk so a couple examples of

1099
00:42:14,710 --> 00:42:12,480
technical uh issues that have been

1100
00:42:16,950 --> 00:42:14,720
closed out before the review

1101
00:42:19,030 --> 00:42:16,960
but were reviewed by the board lots of

1102
00:42:21,589 --> 00:42:19,040
questions lots of back and forth and in

1103
00:42:23,430 --> 00:42:21,599
the end we agreed with the program

1104
00:42:27,030 --> 00:42:23,440
there that with them closing those

1105
00:42:30,470 --> 00:42:29,349
and our next question is from jeff faust

1106
00:42:31,990 --> 00:42:30,480
at space news

1107
00:42:34,150 --> 00:42:32,000
jeff

1108
00:42:35,430 --> 00:42:34,160
yeah good afternoon um

1109
00:42:37,270 --> 00:42:35,440
actually just to sort of follow up on

1110
00:42:39,510 --> 00:42:37,280
the previous question there's you know

1111
00:42:41,990 --> 00:42:39,520
discussion that there's still some open

1112
00:42:44,870 --> 00:42:42,000
work left to do to tie up loose ends

1113
00:42:46,630 --> 00:42:44,880

before the launch can you give some

1114
00:42:48,550 --> 00:42:46,640
examples of some of that open work that

1115
00:42:50,630 --> 00:42:48,560
still has to be done

1116
00:42:56,150 --> 00:42:50,640
between now and presumably the launch

1117
00:43:01,589 --> 00:42:58,150
so i think you know we we mentioned the

1118
00:43:04,069 --> 00:43:01,599
open work there's um final checkouts on

1119
00:43:06,950 --> 00:43:04,079
the spacecraft that happen like

1120
00:43:08,550 --> 00:43:06,960
prior to final hatch closure

1121
00:43:09,829 --> 00:43:08,560
that's normal

1122
00:43:11,349 --> 00:43:09,839
standard work

1123
00:43:13,670 --> 00:43:11,359
we already mentioned the big event the

1124
00:43:14,950 --> 00:43:13,680
big event obviously static fire today

1125
00:43:17,190 --> 00:43:14,960
making sure

1126
00:43:20,550 --> 00:43:17,200
the launch vehicle final checkouts on

1127
00:43:23,109 --> 00:43:20,560
the vehicles are done

1128
00:43:24,790 --> 00:43:23,119
going through and doing dry dress i mean

1129
00:43:27,190 --> 00:43:24,800
like we already talked about dry dress

1130
00:43:29,510 --> 00:43:27,200
and making sure that whole system for

1131
00:43:31,510 --> 00:43:29,520
delivery of the crew to the pad working

1132
00:43:32,950 --> 00:43:31,520
through all those pieces making sure

1133
00:43:36,630 --> 00:43:32,960
everything's

1134
00:43:40,309 --> 00:43:36,640
working you know days before the launch

1135
00:43:41,349 --> 00:43:40,319
that's all normal open work

1136
00:43:43,990 --> 00:43:41,359
and then

1137
00:43:46,230 --> 00:43:44,000
doing the job of

1138
00:43:48,150 --> 00:43:46,240

going through all the data

1139
00:43:50,069 --> 00:43:48,160
out of the tests

1140
00:43:52,790 --> 00:43:50,079
you know we'll be working

1141
00:43:56,470 --> 00:43:52,800
you know saturday sunday monday you know

1142
00:43:58,309 --> 00:43:56,480
tuesday up to launch day to make sure

1143
00:43:59,990 --> 00:43:58,319
that we're still checking everything out

1144
00:44:02,550 --> 00:44:00,000
you know i talked a couple weeks ago

1145
00:44:04,309 --> 00:44:02,560
about continuing to dot the eyes and

1146
00:44:05,750 --> 00:44:04,319
cross the t's and

1147
00:44:09,430 --> 00:44:05,760
that's the kind of open work we're

1148
00:44:11,430 --> 00:44:09,440
talking about right now

1149
00:44:25,829 --> 00:44:11,440
and our next question is from dave moser

1150
00:44:28,790 --> 00:44:27,190
and our next question will actually be

1151
00:44:30,790 --> 00:44:28,800
from jackie goddard with the irish times

1152
00:44:32,950 --> 00:44:30,800
of london jackie

1153
00:44:34,710 --> 00:44:32,960
the times yes hello thank you my

1154
00:44:36,150 --> 00:44:34,720
question i think is the kirk earlier

1155
00:44:38,069 --> 00:44:36,160
this week there was a report from

1156
00:44:41,270 --> 00:44:38,079
sputnik the russian government news

1157
00:44:43,030 --> 00:44:41,280
agency that quoted roscosmos officials

1158
00:44:44,870 --> 00:44:43,040
um saying that they were monitoring

1159
00:44:47,109 --> 00:44:44,880
increased benzene levels inside the

1160
00:44:48,390 --> 00:44:47,119
space station they stressed there was no

1161
00:44:51,030 --> 00:44:48,400
threat to crew and that the

1162
00:44:53,190 --> 00:44:51,040
concentrations um didn't exceed the

1163
00:44:55,349 --> 00:44:53,200

exposure limit but can you tell us what

1164
00:44:58,069 --> 00:44:55,359
that's all about was there any focus of

1165
00:45:00,069 --> 00:44:58,079
conversation at the review

1166
00:45:02,630 --> 00:45:00,079
and does it raise any potential for

1167
00:45:04,790 --> 00:45:02,640
concern with sending two additional crew

1168
00:45:06,630 --> 00:45:04,800
up thank you

1169
00:45:08,710 --> 00:45:06,640
well the what's going on in the russian

1170
00:45:10,390 --> 00:45:08,720
government uh i'm not i'm not the right

1171
00:45:12,790 --> 00:45:10,400
person to ask i think rose cosmos would

1172
00:45:14,390 --> 00:45:12,800
be the right right group to ask i can

1173
00:45:18,309 --> 00:45:14,400
tell you that we work very closely with

1174
00:45:21,109 --> 00:45:18,319
our russian partners i speak to them

1175
00:45:23,030 --> 00:45:21,119
if not if not daily certainly weekly

1176
00:45:25,510 --> 00:45:23,040
we actually have some people in my

1177
00:45:28,630 --> 00:45:25,520
organization who live in moscow and so

1178
00:45:30,390 --> 00:45:28,640
we're very very close great partners

1179
00:45:33,109 --> 00:45:30,400
there has been no discussion about any

1180
00:45:34,710 --> 00:45:33,119
change any immediate change uh

1181
00:45:36,950 --> 00:45:34,720
in in the work that they're doing

1182
00:45:39,910 --> 00:45:36,960
certainly no increased risk to the to

1183
00:45:41,990 --> 00:45:39,920
the crew today uh as a result of any of

1184
00:45:43,510 --> 00:45:42,000
this so i'm not concerned at all

1185
00:45:45,990 --> 00:45:43,520
about that i think maybe what they're

1186
00:45:47,430 --> 00:45:46,000
referring to might be longer term

1187
00:45:49,030 --> 00:45:47,440
decisions that the russian government

1188
00:45:50,710 --> 00:45:49,040

and the russian space agency could make

1189
00:45:51,829 --> 00:45:50,720
but but that would really be a question

1190
00:45:53,510 --> 00:45:51,839
for them

1191
00:45:55,750 --> 00:45:53,520
um so

1192
00:45:58,309 --> 00:45:55,760
the russian crew i actually spoke with

1193
00:46:00,790 --> 00:45:58,319
yvonne and anatoly on orbit this week

1194
00:46:02,150 --> 00:46:00,800
and they're very excited about about

1195
00:46:05,190 --> 00:46:02,160
having two more crew members come up

1196
00:46:07,030 --> 00:46:05,200
there the iss is in great shape

1197
00:46:08,309 --> 00:46:07,040
the crew on orbits in great shape i know

1198
00:46:09,589 --> 00:46:08,319
the crew here on the ground you guys

1199
00:46:11,510 --> 00:46:09,599
just talk with them they're in great

1200
00:46:13,750 --> 00:46:11,520
shape so i think

1201
00:46:15,990 --> 00:46:13,760
i think the the vehicle on orbit's ready

1202
00:46:20,309 --> 00:46:16,000
to go and and we're working to make the

1203
00:46:25,670 --> 00:46:22,150
okay and our next question is from

1204
00:46:28,230 --> 00:46:25,680
antonia amarillo with florida today

1205
00:46:30,470 --> 00:46:28,240
yes hi thanks for taking my question um

1206
00:46:31,829 --> 00:46:30,480
i was wondering why does it take crew

1207
00:46:34,230 --> 00:46:31,839
dragon um

1208
00:46:36,950 --> 00:46:34,240
19 hours to reach the international

1209
00:46:39,349 --> 00:46:36,960
space station when it only takes soyuz

1210
00:46:41,750 --> 00:46:39,359
six hours and uh can crew dragon you

1211
00:46:45,030 --> 00:46:41,760
know get there to the space station

1212
00:46:49,190 --> 00:46:45,040
quicker uh and if so why hasn't spacex

1213
00:46:53,510 --> 00:46:51,510

you bet

1214
00:46:55,109 --> 00:46:53,520
uh absolutely i mean it really it's

1215
00:46:56,390 --> 00:46:55,119
about orbital mechanics it's about when

1216
00:46:57,589 --> 00:46:56,400
you launch right

1217
00:47:00,150 --> 00:46:57,599
there's uh there's phasing that you have

1218
00:47:01,270 --> 00:47:00,160
to do to get to the space station and so

1219
00:47:03,670 --> 00:47:01,280
you look at the different launch

1220
00:47:05,990 --> 00:47:03,680
opportunities again based on weather

1221
00:47:07,750 --> 00:47:06,000
and a whole number of other factors

1222
00:47:09,670 --> 00:47:07,760
and and you and you determine when's the

1223
00:47:11,349 --> 00:47:09,680
best time to launch and so you set up a

1224
00:47:12,870 --> 00:47:11,359
number of launch opportunities days and

1225
00:47:14,230 --> 00:47:12,880
times

1226
00:47:16,230 --> 00:47:14,240
and some of those launch opportunities

1227
00:47:18,790 --> 00:47:16,240
require more phasing time

1228
00:47:21,349 --> 00:47:18,800
and some of them require less and so the

1229
00:47:23,030 --> 00:47:21,359
on the 27th it's about a 19 hour

1230
00:47:24,470 --> 00:47:23,040
phasing but then you know on other days

1231
00:47:26,710 --> 00:47:24,480
it would be less other days it could be

1232
00:47:29,270 --> 00:47:26,720
more so it really just depends on on the

1233
00:47:31,349 --> 00:47:29,280
launch it's the orbit of space station

1234
00:47:35,190 --> 00:47:31,359
and the time of day and time of year um

1235
00:47:39,430 --> 00:47:37,109
one more thing you know this is a test

1236
00:47:41,270 --> 00:47:39,440
flight you know we we talk about this

1237
00:47:42,870 --> 00:47:41,280
launch but this is a test flight right

1238
00:47:43,990 --> 00:47:42,880

and so

1239
00:47:45,910 --> 00:47:44,000
we could have we could have picked

1240
00:47:48,710 --> 00:47:45,920
different launch days that had different

1241
00:47:50,630 --> 00:47:48,720
phasing opportunities right and but

1242
00:47:52,549 --> 00:47:50,640
there's also checkouts that we're doing

1243
00:47:54,870 --> 00:47:52,559
along the way

1244
00:47:56,630 --> 00:47:54,880
so we kind of picked a day that would

1245
00:47:59,510 --> 00:47:56,640
also a phasing opportunity that would

1246
00:48:01,990 --> 00:47:59,520
give us the time to be able to do

1247
00:48:03,750 --> 00:48:02,000
those checkouts along the way because

1248
00:48:05,349 --> 00:48:03,760
this is a critical

1249
00:48:08,630 --> 00:48:05,359
test flight bob and doug are going to

1250
00:48:10,710 --> 00:48:08,640
get to test fly the vehicle and check it

1251
00:48:12,710 --> 00:48:10,720
out and make sure that

1252
00:48:16,870 --> 00:48:12,720
first time people are going to be in a

1253
00:48:18,710 --> 00:48:16,880
spacex vehicle and get to kind of

1254
00:48:20,950 --> 00:48:18,720
you know take it out for a test run

1255
00:48:24,470 --> 00:48:20,960
there and and make sure that before it's

1256
00:48:26,230 --> 00:48:24,480
certified that the design is working so

1257
00:48:29,349 --> 00:48:26,240
this is a really really important flight

1258
00:48:32,150 --> 00:48:29,359
for us we got two great test pilots

1259
00:48:34,549 --> 00:48:32,160
in there and uh they're they're going to

1260
00:48:36,630 --> 00:48:34,559
be checking out the vehicle

1261
00:48:38,710 --> 00:48:36,640
and if i could add one more thing the

1262
00:48:41,510 --> 00:48:38,720
soyuz was designed in the 70s started

1263
00:48:43,829 --> 00:48:41,520

flying in the 80s and the norm has been

1264
00:48:45,510 --> 00:48:43,839
34 bits or really two days to get for

1265
00:48:47,510 --> 00:48:45,520
the soyuz to get to international space

1266
00:48:49,109 --> 00:48:47,520
station it's only been in the last three

1267
00:48:51,349 --> 00:48:49,119
three and a half years that they started

1268
00:48:53,750 --> 00:48:51,359
going to instead of two and a half two

1269
00:48:55,510 --> 00:48:53,760
days to get to six hours

1270
00:48:58,230 --> 00:48:55,520
and so um

1271
00:49:00,230 --> 00:48:58,240
i'm counting on on spacex to

1272
00:49:03,430 --> 00:49:00,240
to accelerate the time

1273
00:49:05,190 --> 00:49:03,440
in the next 20 years so

1274
00:49:06,470 --> 00:49:05,200
i'll and i'll i'll say kathy makes a

1275
00:49:07,510 --> 00:49:06,480
really good point one of the cool things

1276
00:49:09,270 --> 00:49:07,520
that the

1277
00:49:11,030 --> 00:49:09,280
the uh uh and we're gonna work on that

1278
00:49:12,390 --> 00:49:11,040
kirk

1279
00:49:15,510 --> 00:49:12,400
and i hope it's a lot sooner than 20

1280
00:49:17,190 --> 00:49:15,520
years uh but uh is bob i'm gonna get a

1281
00:49:18,710 --> 00:49:17,200
chance to try sleeping on dragon and

1282
00:49:21,030 --> 00:49:18,720
that's a really good point and and

1283
00:49:23,190 --> 00:49:21,040
another thing about the crew is that

1284
00:49:25,430 --> 00:49:23,200
they have taken to heart as test pilots

1285
00:49:26,390 --> 00:49:25,440
um the importance of their work to to

1286
00:49:28,150 --> 00:49:26,400
ensure

1287
00:49:30,950 --> 00:49:28,160
the readiness of the vehicle and the

1288
00:49:33,349 --> 00:49:30,960

system and the program for future crews

1289
00:49:35,910 --> 00:49:33,359
to them in their mind was always

1290
00:49:38,549 --> 00:49:35,920
is this the right safe reliable system

1291
00:49:41,109 --> 00:49:38,559
for anybody to fly in but but also for

1292
00:49:42,710 --> 00:49:41,119
to make sure that their colleagues um in

1293
00:49:44,790 --> 00:49:42,720
the in the in the crew office would be

1294
00:49:46,069 --> 00:49:44,800
able to continue to to do exactly what

1295
00:49:48,150 --> 00:49:46,079
they want to do so they're testing it

1296
00:49:49,829 --> 00:49:48,160
out not just for themselves but for

1297
00:49:50,950 --> 00:49:49,839
all future flights and that was one

1298
00:49:51,990 --> 00:49:50,960
that's exactly right it's one of the

1299
00:49:54,069 --> 00:49:52,000
reasons we want to make sure they got to

1300
00:49:55,750 --> 00:49:54,079
sleep on board they got to you know eat

1301
00:49:58,150 --> 00:49:55,760
meals and and do all that kind of cool

1302
00:49:59,750 --> 00:49:58,160
stuff while they're on board dragon

1303
00:50:02,710 --> 00:49:59,760
yet trying to get them to station as

1304
00:50:04,309 --> 00:50:02,720
quickly and safely as possible

1305
00:50:07,589 --> 00:50:04,319
and our next question is from jackie

1306
00:50:09,750 --> 00:50:07,599
waddles at cnn jackie

1307
00:50:12,870 --> 00:50:09,760
hey folks thanks so much for doing this

1308
00:50:15,109 --> 00:50:12,880
and my question is for steve um so it's

1309
00:50:17,270 --> 00:50:15,119
doug lovero leaving the heo this week

1310
00:50:19,910 --> 00:50:17,280
steve i know you took over doug's role

1311
00:50:21,829 --> 00:50:19,920
in this review and i was curious if you

1312
00:50:24,150 --> 00:50:21,839
had to do any additional preparation to

1313
00:50:25,750 --> 00:50:24,160

assume that role um and if that last

1314
00:50:28,630 --> 00:50:25,760
minute change created a new challenges

1315
00:50:30,549 --> 00:50:28,640
over the past couple days

1316
00:50:32,870 --> 00:50:30,559
yeah actually um

1317
00:50:35,190 --> 00:50:32,880
i've been conducting uh agency level

1318
00:50:37,349 --> 00:50:35,200
reviews of the commercial crew program

1319
00:50:39,430 --> 00:50:37,359
for the last two years

1320
00:50:41,109 --> 00:50:39,440
as the associate administrator as part

1321
00:50:43,030 --> 00:50:41,119
of the my

1322
00:50:44,549 --> 00:50:43,040
chairmanship of the agency program

1323
00:50:46,870 --> 00:50:44,559
management council

1324
00:50:48,870 --> 00:50:46,880
so every two to three months kathy has

1325
00:50:52,549 --> 00:50:48,880
come in and briefed agency leadership

1326
00:50:56,069 --> 00:50:54,470
all the issues and challenges the

1327
00:50:57,750 --> 00:50:56,079
resolution of them or paths to

1328
00:51:00,150 --> 00:50:57,760
resolution

1329
00:51:02,069 --> 00:51:00,160
so those reviews you know prepared me

1330
00:51:03,990 --> 00:51:02,079
really well to step in and share the

1331
00:51:04,950 --> 00:51:04,000
flight readiness review as well as

1332
00:51:07,030 --> 00:51:04,960
i think

1333
00:51:08,950 --> 00:51:07,040
quarterly the aerospace safety advisory

1334
00:51:10,549 --> 00:51:08,960
panel reviews the commercial programming

1335
00:51:12,549 --> 00:51:10,559
program and kathy makes a presentation

1336
00:51:15,750 --> 00:51:12,559
to them i think i've sat in on all or

1337
00:51:16,470 --> 00:51:15,760
most of those reviews also

1338
00:51:18,950 --> 00:51:16,480

so

1339
00:51:21,109 --> 00:51:18,960
given all that i was well prepared i

1340
00:51:23,190 --> 00:51:21,119
also want to stress that

1341
00:51:24,630 --> 00:51:23,200
was a series of really great reviews

1342
00:51:26,630 --> 00:51:24,640
leading up to the flight rate industry

1343
00:51:29,109 --> 00:51:26,640
it wasn't just this one review so there

1344
00:51:31,750 --> 00:51:29,119
are engineering reviews of each system

1345
00:51:33,589 --> 00:51:31,760
on dragon and on falcon

1346
00:51:35,109 --> 00:51:33,599
by the engineering teams

1347
00:51:37,670 --> 00:51:35,119
they were a little concerned about doing

1348
00:51:40,150 --> 00:51:37,680
those virtually versus face-to-face

1349
00:51:42,069 --> 00:51:40,160
given covert 19 but the feedback i got

1350
00:51:44,390 --> 00:51:42,079
was that the i received was those

1351
00:51:46,710 --> 00:51:44,400
reviews were very effective

1352
00:51:49,109 --> 00:51:46,720
then there was the station operations

1353
00:51:51,510 --> 00:51:49,119
readiness review by kirk

1354
00:51:54,549 --> 00:51:51,520
very good successful review there was a

1355
00:51:56,230 --> 00:51:54,559
flight readiness review by spacex led

1356
00:51:57,430 --> 00:51:56,240
for their purposes

1357
00:51:59,750 --> 00:51:57,440
there was a flight

1358
00:52:01,829 --> 00:51:59,760
test readiness review led by kathy and

1359
00:52:03,270 --> 00:52:01,839
the team and that led up to the flight

1360
00:52:04,950 --> 00:52:03,280
readiness review

1361
00:52:06,309 --> 00:52:04,960
so i sat and also on some of those

1362
00:52:09,190 --> 00:52:06,319
reviews so

1363
00:52:10,710 --> 00:52:09,200

i felt i felt very very prepared to

1364
00:52:11,990 --> 00:52:10,720
chair the review

1365
00:52:14,150 --> 00:52:12,000
and um

1366
00:52:16,150 --> 00:52:14,160
and so i don't think there are any

1367
00:52:18,390 --> 00:52:16,160
significant challenges

1368
00:52:21,030 --> 00:52:18,400
in transitioning uh from doug to myself

1369
00:52:22,630 --> 00:52:21,040
and sharing the frr

1370
00:52:25,190 --> 00:52:22,640
and our next question is from marcia

1371
00:52:27,910 --> 00:52:25,200
dunn associated press marcia

1372
00:52:30,790 --> 00:52:27,920
yes hello um i'd like both spacex and

1373
00:52:33,829 --> 00:52:30,800
nasa to address this all space flight is

1374
00:52:37,030 --> 00:52:33,839
risky but this is a true test flight

1375
00:52:40,470 --> 00:52:37,040
and i'd like to um big picture from you

1376
00:52:42,470 --> 00:52:40,480
on just how risky how dangerous

1377
00:52:44,230 --> 00:52:42,480
uh this mission is that bob and doug are

1378
00:52:47,430 --> 00:52:44,240
about to embark on i'm not looking for

1379
00:52:48,950 --> 00:52:47,440
statistics or numbers but just

1380
00:52:50,870 --> 00:52:48,960
in your guts what are you feeling about

1381
00:52:58,630 --> 00:52:50,880
the dangers and the risks

1382
00:53:01,700 --> 00:53:00,230
well there's lots of people that are

1383
00:53:04,230 --> 00:53:01,710
nasa

1384
00:53:07,589 --> 00:53:04,240
[Laughter]

1385
00:53:09,510 --> 00:53:07,599
well you know marcia i i um it's really

1386
00:53:12,150 --> 00:53:09,520
hard as a program manager because my job

1387
00:53:13,030 --> 00:53:12,160
is to buy down risk right

1388
00:53:16,549 --> 00:53:13,040

and

1389
00:53:19,030 --> 00:53:16,559
um for the last like with steve

1390
00:53:21,030 --> 00:53:19,040
laid out i mean really for the last five

1391
00:53:22,950 --> 00:53:21,040
years as program manager that's what i

1392
00:53:23,829 --> 00:53:22,960
feel like i've been doing

1393
00:53:26,790 --> 00:53:23,839
so

1394
00:53:28,710 --> 00:53:26,800
if i right now we are trying to identify

1395
00:53:32,390 --> 00:53:28,720
any risk that we know of that's out

1396
00:53:34,870 --> 00:53:32,400
there and continue to look at risks

1397
00:53:36,950 --> 00:53:34,880
and buy them down but we also

1398
00:53:38,309 --> 00:53:36,960
can't fool ourselves you know human

1399
00:53:41,190 --> 00:53:38,319
space flight

1400
00:53:42,950 --> 00:53:41,200
is really really tough

1401
00:53:44,150 --> 00:53:42,960
and uh

1402
00:53:46,870 --> 00:53:44,160
you know we

1403
00:53:48,230 --> 00:53:46,880
it's why we continue to look for risks

1404
00:53:51,190 --> 00:53:48,240
and and

1405
00:53:53,270 --> 00:53:51,200
um do additional assessments and where

1406
00:53:55,510 --> 00:53:53,280
we never feel

1407
00:53:58,470 --> 00:53:55,520
comfortable because that's when you're

1408
00:54:00,309 --> 00:53:58,480
not searching right so

1409
00:54:02,069 --> 00:54:00,319
um

1410
00:54:05,510 --> 00:54:02,079
i think you know we talked today about

1411
00:54:06,870 --> 00:54:05,520
staying hungry and so um we're going to

1412
00:54:09,990 --> 00:54:06,880
stay hungry and we're going to stay

1413
00:54:12,630 --> 00:54:10,000

hungry until bob and doug come home but

1414
00:54:14,790 --> 00:54:12,640
i've thought of every single risk we've

1415
00:54:16,390 --> 00:54:14,800
been sitting here scouring our teams are

1416
00:54:17,910 --> 00:54:16,400
scouring and thinking of every single

1417
00:54:19,829 --> 00:54:17,920
risk that's out there

1418
00:54:21,910 --> 00:54:19,839
and we've worked our butt off to buy

1419
00:54:24,870 --> 00:54:21,920
down the ones we know of

1420
00:54:26,470 --> 00:54:24,880
and we'll continue to look and continue

1421
00:54:30,549 --> 00:54:26,480
to buy them down until we bring them

1422
00:54:37,030 --> 00:54:33,829
kathy said it very very well and um you

1423
00:54:38,710 --> 00:54:37,040
know it is tough space flight is hard

1424
00:54:40,789 --> 00:54:38,720
but because of that

1425
00:54:41,990 --> 00:54:40,799
we search ourselves and search our souls

1426
00:54:43,030 --> 00:54:42,000
we encourage

1427
00:54:44,710 --> 00:54:43,040
each other

1428
00:54:46,309 --> 00:54:44,720
you know in our partnership with nasa

1429
00:54:48,390 --> 00:54:46,319
and spacex but certainly within our

1430
00:54:50,230 --> 00:54:48,400
company we encourage everyone to look

1431
00:54:51,990 --> 00:54:50,240
over each other's shoulders

1432
00:54:54,630 --> 00:54:52,000
we say you know challenge each other all

1433
00:54:57,109 --> 00:54:54,640
the time um don't take offense when

1434
00:54:59,349 --> 00:54:57,119
people challenge your work encourage it

1435
00:55:01,109 --> 00:54:59,359
um we are in the kind of the period

1436
00:55:03,349 --> 00:55:01,119
right now the final preparations for

1437
00:55:05,190 --> 00:55:03,359
flight but also where the majority of

1438
00:55:06,390 --> 00:55:05,200

you know the engineers and and people in

1439
00:55:08,230 --> 00:55:06,400
the factory and everybody who've been

1440
00:55:09,589 --> 00:55:08,240
working on this all of these years

1441
00:55:11,190 --> 00:55:09,599
they're now kind of into a period where

1442
00:55:13,190 --> 00:55:11,200
they're doing their triple checks and

1443
00:55:14,710 --> 00:55:13,200
quadruple checks they're looking under

1444
00:55:15,990 --> 00:55:14,720
every stone and turning over every rock

1445
00:55:17,750 --> 00:55:16,000
just to make sure

1446
00:55:19,190 --> 00:55:17,760
that we're really ready to go and we

1447
00:55:20,950 --> 00:55:19,200
have a standing policy in the company

1448
00:55:23,270 --> 00:55:20,960
that anybody

1449
00:55:25,430 --> 00:55:23,280
can can can raise an issue anybody can

1450
00:55:26,789 --> 00:55:25,440
raise a risk we have systems in place

1451
00:55:29,349 --> 00:55:26,799
that actually allow anybody in the

1452
00:55:31,910 --> 00:55:29,359
company to open a risk what we call risk

1453
00:55:33,349 --> 00:55:31,920
tickets to open up an issue to say okay

1454
00:55:35,430 --> 00:55:33,359
i'm worried about something and they

1455
00:55:37,430 --> 00:55:35,440
have a direct line to you know senior

1456
00:55:39,349 --> 00:55:37,440
leadership to say hey i'm worried about

1457
00:55:41,670 --> 00:55:39,359
this up to the moment of launch

1458
00:55:43,990 --> 00:55:41,680
um bottom line is is it's tough but we

1459
00:55:45,510 --> 00:55:44,000
won't launch until we're ready and and

1460
00:55:48,710 --> 00:55:45,520
we will listen to the data and we'll

1461
00:55:50,390 --> 00:55:48,720
listen to the people

1462
00:55:53,430 --> 00:55:50,400
and our final question will be from joey

1463
00:55:56,309 --> 00:55:53,440

roulette reuters joey

1464
00:55:59,190 --> 00:55:56,319
hey thanks so much for doing this um for

1465
00:56:00,630 --> 00:55:59,200
kirk shireman or anyone else um kirk you

1466
00:56:02,470 --> 00:56:00,640
mentioned the role international

1467
00:56:05,190 --> 00:56:02,480
partners played i was wondering if you

1468
00:56:07,190 --> 00:56:05,200
could give some examples of the response

1469
00:56:09,109 --> 00:56:07,200
and any concerns released by those

1470
00:56:10,390 --> 00:56:09,119
international partners specifically ross

1471
00:56:12,789 --> 00:56:10,400
cosmos

1472
00:56:15,190 --> 00:56:12,799
in regard to this review and then for

1473
00:56:16,470 --> 00:56:15,200
benji reid will any data from this

1474
00:56:18,789 --> 00:56:16,480
mission inform

1475
00:56:20,950 --> 00:56:18,799
starship design or starship missions in

1476
00:56:22,710 --> 00:56:20,960
the future and would starship ever

1477
00:56:26,150 --> 00:56:22,720
do any test flights like this one to the

1478
00:56:29,589 --> 00:56:27,670
from an international start partner

1479
00:56:32,390 --> 00:56:29,599
standpoint it's really interesting uh

1480
00:56:35,430 --> 00:56:32,400
one is we're partnership and and we

1481
00:56:37,430 --> 00:56:35,440
expect all our partners uh astronauts

1482
00:56:39,750 --> 00:56:37,440
and cosmonauts to fly on these vehicles

1483
00:56:41,589 --> 00:56:39,760
on on the spacex vehicle so

1484
00:56:43,109 --> 00:56:41,599
they have a very vested interest in this

1485
00:56:45,030 --> 00:56:43,119
particular test flight there are no

1486
00:56:47,430 --> 00:56:45,040
international partners but the very next

1487
00:56:49,190 --> 00:56:47,440
flight there will be and so

1488
00:56:51,589 --> 00:56:49,200

all the international partners were were

1489
00:56:53,349 --> 00:56:51,599
participating along the way because they

1490
00:56:55,030 --> 00:56:53,359
know that their crew members will be

1491
00:56:57,030 --> 00:56:55,040
flying on this vehicle number one number

1492
00:56:58,950 --> 00:56:57,040
two is it's docking to the international

1493
00:57:00,390 --> 00:56:58,960
space station and all those countries

1494
00:57:01,990 --> 00:57:00,400
have made huge investments in that

1495
00:57:04,630 --> 00:57:02,000
vehicle we want to make sure that we're

1496
00:57:06,069 --> 00:57:04,640
not risking the investment in that

1497
00:57:07,589 --> 00:57:06,079
vehicle up there or by the way their

1498
00:57:09,910 --> 00:57:07,599
crew members who are living on board the

1499
00:57:11,510 --> 00:57:09,920
international space station so all along

1500
00:57:14,069 --> 00:57:11,520
very very interested

1501
00:57:15,589 --> 00:57:14,079
the the the difficulties here

1502
00:57:17,030 --> 00:57:15,599
one of course i talked a little bit

1503
00:57:19,190 --> 00:57:17,040
about time zones that's always a

1504
00:57:22,549 --> 00:57:19,200
difficulty but we also had export

1505
00:57:24,230 --> 00:57:22,559
control so uh when we develop a vehicle

1506
00:57:26,630 --> 00:57:24,240
here in the united states all that

1507
00:57:28,069 --> 00:57:26,640
technology is not allowed to be exported

1508
00:57:29,430 --> 00:57:28,079
from the united states so we have to

1509
00:57:31,670 --> 00:57:29,440
live within those laws and finally

1510
00:57:33,430 --> 00:57:31,680
there's proprietary data so

1511
00:57:35,510 --> 00:57:33,440
if the data was allowed to be exported

1512
00:57:37,670 --> 00:57:35,520
but it was spacex proprietary then we

1513
00:57:39,270 --> 00:57:37,680

would have to redact that data so we

1514
00:57:41,190 --> 00:57:39,280
conducted these discussions with our

1515
00:57:42,630 --> 00:57:41,200
international partners along the way

1516
00:57:44,230 --> 00:57:42,640
answered their questions assured them

1517
00:57:46,710 --> 00:57:44,240
that their crew members would be safe

1518
00:57:48,549 --> 00:57:46,720
all the while meeting the u.s laws on

1519
00:57:51,670 --> 00:57:48,559
export control and honoring the

1520
00:57:53,829 --> 00:57:51,680
proprietary data from spacex so

1521
00:57:55,829 --> 00:57:53,839
the fact that we did that and all the

1522
00:57:57,589 --> 00:57:55,839
partners were were part of this review

1523
00:57:59,349 --> 00:57:57,599
were part of all this work and we're

1524
00:58:01,910 --> 00:57:59,359
we're ready to proceed it's really uh

1525
00:58:04,390 --> 00:58:01,920
really an amazing thing so we're very

1526
00:58:05,349 --> 00:58:04,400
happy about about that aspect

1527
00:58:07,030 --> 00:58:05,359
benji

1528
00:58:09,030 --> 00:58:07,040
sure and just kind of following up real

1529
00:58:10,470 --> 00:58:09,040
quick first on what kirk said it's it's

1530
00:58:12,230 --> 00:58:10,480
uh it's exciting for us to get to work

1531
00:58:13,990 --> 00:58:12,240
with international partners as well

1532
00:58:16,470 --> 00:58:14,000
we've had that opportunity on the cargo

1533
00:58:19,190 --> 00:58:16,480
program um from the early days because

1534
00:58:20,950 --> 00:58:19,200
again they jointly run the space station

1535
00:58:22,950 --> 00:58:20,960
and are partners in that so

1536
00:58:24,710 --> 00:58:22,960
coming up and bringing cargo we had to

1537
00:58:26,309 --> 00:58:24,720
work with them and getting to work with

1538
00:58:28,549 --> 00:58:26,319

the partners and work with all kinds of

1539
00:58:30,150 --> 00:58:28,559
people around the world is exactly what

1540
00:58:33,270 --> 00:58:30,160
we want to do we want to send all kinds

1541
00:58:35,030 --> 00:58:33,280
of people to space um and and ultimately

1542
00:58:37,030 --> 00:58:35,040
this this this mission coming up and

1543
00:58:39,750 --> 00:58:37,040
everything we're doing is is to open

1544
00:58:40,630 --> 00:58:39,760
that that new chapter in in the space

1545
00:58:42,789 --> 00:58:40,640
age

1546
00:58:43,829 --> 00:58:42,799
and ultimately make life multi-planetary

1547
00:58:45,990 --> 00:58:43,839
that's what we want to do and it's

1548
00:58:47,750 --> 00:58:46,000
exciting to do it and see after this

1549
00:58:49,510 --> 00:58:47,760
mission um you know what what more

1550
00:58:51,670 --> 00:58:49,520
missions will be doing with the space

1551
00:58:53,829 --> 00:58:51,680
station and with others um in terms of

1552
00:58:55,829 --> 00:58:53,839
the data um and you know will this

1553
00:58:58,309 --> 00:58:55,839
inform data on starship or or other

1554
00:59:00,549 --> 00:58:58,319
programs absolutely data is data and we

1555
00:59:01,990 --> 00:59:00,559
love it we love data we want to learn we

1556
00:59:04,870 --> 00:59:02,000
want to learn from everything we do and

1557
00:59:06,950 --> 00:59:04,880
apply it wherever we can to be safer to

1558
00:59:08,630 --> 00:59:06,960
be more reliable to be more efficient

1559
00:59:11,829 --> 00:59:08,640
and again ultimately be able to take

1560
00:59:14,470 --> 00:59:11,839
lots and lots of people into space

1561
00:59:16,390 --> 00:59:14,480
thank you and now we'll go back for some

1562
00:59:18,870 --> 00:59:16,400
final closing comments for from steve

1563
00:59:20,789 --> 00:59:18,880

jersey steve hey thanks josh

1564
00:59:23,430 --> 00:59:20,799
so yeah i just want to reiterate that we

1565
00:59:26,230 --> 00:59:23,440
had a very successful flight readiness

1566
00:59:29,589 --> 00:59:26,240
for you in that we did a thorough view

1567
00:59:32,789 --> 00:59:29,599
of all the systems and all the all the

1568
00:59:35,990 --> 00:59:32,799
risks and i was unanimous on the board

1569
00:59:38,309 --> 00:59:36,000
that we are go for launch

1570
00:59:40,309 --> 00:59:38,319
it is really exciting to be launching

1571
00:59:42,470 --> 00:59:40,319
american astronauts on american rockets

1572
00:59:45,829 --> 00:59:42,480
for american soil from kennedy space

1573
00:59:48,069 --> 00:59:45,839
center for the first time in nine

1574
00:59:49,589 --> 00:59:48,079
it's i know it's been a long really

1575
00:59:51,190 --> 00:59:49,599
challenging road

1576
00:59:53,349 --> 00:59:51,200
and i just cannot

1577
00:59:54,870 --> 00:59:53,359
tell you how proud i am of the nasa

1578
00:59:56,390 --> 00:59:54,880
spacex team

1579
00:59:59,349 --> 00:59:56,400
for all their

1580
01:00:02,150 --> 00:59:59,359
talent hard work dedication and

1581
01:00:04,630 --> 01:00:02,160
perseverance to get to this point

1582
01:00:06,630 --> 01:00:04,640
of five days from launch

1583
01:00:07,910 --> 01:00:06,640
i could hardly i mean i am i am

1584
01:00:09,750 --> 01:00:07,920
incredibly excited you can hardly

1585
01:00:13,030 --> 01:00:09,760
believe it

1586
01:00:15,190 --> 01:00:13,040
so yeah we want you to join us

1587
01:00:16,950 --> 01:00:15,200
most of you virtually unfortunately

1588
01:00:17,829 --> 01:00:16,960

given the situation

1589
01:00:21,750 --> 01:00:17,839
uh

1590
01:00:23,829 --> 01:00:21,760
on wednesday march 27th at 4 33 pm

1591
01:00:26,309 --> 01:00:23,839
uh when we're going to send bob to doug

1592
01:00:27,510 --> 01:00:26,319
and doug to the national space station

1593
01:00:30,630 --> 01:00:27,520
and doc

1594
01:00:33,829 --> 01:00:30,640
19 hours later and they will become part

1595
01:00:35,190 --> 01:00:33,839
of the next iss expedition

1596
01:00:38,150 --> 01:00:35,200
um so