



1  
00:00:21,269 --> 00:00:19,189  
good afternoon i'm sheryl warner in

2  
00:00:22,710 --> 00:00:21,279  
nasa's office of communications

3  
00:00:24,790 --> 00:00:22,720  
thank you for joining us today to

4  
00:00:26,630 --> 00:00:24,800  
discuss spacex's ninth commercial

5  
00:00:28,630 --> 00:00:26,640  
resupply services mission to the

6  
00:00:30,950 --> 00:00:28,640  
international space station

7  
00:00:33,670 --> 00:00:30,960  
a dragon spacecraft is set to deliver

8  
00:00:35,590 --> 00:00:33,680  
nearly 5 000 pounds of science crew

9  
00:00:36,950 --> 00:00:35,600  
supplies and hardware to the orbiting

10  
00:00:38,709 --> 00:00:36,960  
laboratory

11  
00:00:41,590 --> 00:00:38,719  
the spacecraft is scheduled to lift off

12  
00:00:44,389 --> 00:00:41,600  
on a specific falcon 9 rocket at 12 45

13  
00:00:46,549 --> 00:00:44,399

a.m eastern on monday july 18th from

14

00:00:48,310 --> 00:00:46,559

space launch complex 40 at cape

15

00:00:50,549 --> 00:00:48,320

canaveral air force

16

00:00:53,029 --> 00:00:50,559

station in florida

17

00:00:54,630 --> 00:00:53,039

here to discuss the mission are

18

00:00:56,830 --> 00:00:54,640

joel montebiano

19

00:01:01,590 --> 00:00:56,840

deputy iss program manager for

20

00:01:07,830 --> 00:01:03,750

hans koenigsmann vice president of

21

00:01:16,310 --> 00:01:10,469

julie robinson chief iss program

22

00:01:22,789 --> 00:01:18,310

captain laura godoy launch weather

23

00:01:28,310 --> 00:01:25,350

and cody chambers range safety kennedy

24

00:01:32,230 --> 00:01:30,149

each speaker will deliver brief remarks

25

00:01:33,990 --> 00:01:32,240

please hold your questions until the end

26  
00:01:36,310 --> 00:01:34,000  
anyone on the phone line can press star

27  
00:01:38,310 --> 00:01:36,320  
one at any time to ask a question

28  
00:01:41,030 --> 00:01:38,320  
to submit a question online please use

29  
00:01:42,630 --> 00:01:41,040  
the hashtag asknasa

30  
00:01:44,230 --> 00:01:42,640  
joel we're excited about the cargo

31  
00:01:45,990 --> 00:01:44,240  
headed to the space station especially

32  
00:01:47,510 --> 00:01:46,000  
the international docking adapter what

33  
00:01:49,749 --> 00:01:47,520  
can you tell us about both

34  
00:01:51,270 --> 00:01:49,759  
so well first of all good afternoon and

35  
00:01:52,870 --> 00:01:51,280  
welcome back to

36  
00:01:54,469 --> 00:01:52,880  
kennedy space center it's great to be

37  
00:01:56,230 --> 00:01:54,479  
here for another commercial resupply

38  
00:01:57,910 --> 00:01:56,240

service mission you know we're looking

39

00:01:59,749 --> 00:01:57,920

forward as mission it's bringing

40

00:02:01,190 --> 00:01:59,759

critical supplies critical hardware like

41

00:02:02,789 --> 00:02:01,200

you mentioned the international docking

42

00:02:04,870 --> 00:02:02,799

adapter to the international space

43

00:02:07,510 --> 00:02:04,880

station we've got a busy week ahead of

44

00:02:09,109 --> 00:02:07,520

us so just later this afternoon we'll

45

00:02:11,589 --> 00:02:09,119

have a progress launch

46

00:02:14,710 --> 00:02:11,599

from baikonur kazakhstan they're

47

00:02:16,150 --> 00:02:14,720

scheduled to launch at 5 40 kennedy

48

00:02:18,550 --> 00:02:16,160

space center time

49

00:02:21,190 --> 00:02:18,560

they'll go ahead and dock monday evening

50

00:02:24,309 --> 00:02:21,200

around 8 30 kennedy space center time

51  
00:02:27,190 --> 00:02:24,319  
we'll have this launch just about 15

52  
00:02:29,110 --> 00:02:27,200  
minutes prior to 1 am monday morning and

53  
00:02:31,270 --> 00:02:29,120  
then the birthing on the wednesday

54  
00:02:33,430 --> 00:02:31,280  
morning kennedy space center time

55  
00:02:35,190 --> 00:02:33,440  
so and this just adds to the the busy

56  
00:02:37,110 --> 00:02:35,200  
time we've been having about a week and

57  
00:02:38,790 --> 00:02:37,120  
a half ago we had a soyuz launch from

58  
00:02:40,150 --> 00:02:38,800  
baikonur kazakhstan three new crew

59  
00:02:42,790 --> 00:02:40,160  
members were added to the international

60  
00:02:44,550 --> 00:02:42,800  
space station the crew has wasted no

61  
00:02:46,550 --> 00:02:44,560  
time getting acclimated and they're

62  
00:02:48,869 --> 00:02:46,560  
running and going i mean they are doing

63  
00:02:50,869 --> 00:02:48,879

picking up the science program uh that

64

00:02:52,949 --> 00:02:50,879

we've been working so hard to maintain

65

00:02:54,710 --> 00:02:52,959

for for everyone they've just been

66

00:02:57,190 --> 00:02:54,720

picking up without a beat so we're glad

67

00:03:00,630 --> 00:02:57,200

to see those guys are there

68

00:03:02,390 --> 00:03:00,640

as far as this mission you know the uh

69

00:03:04,550 --> 00:03:02,400

again another mission coming to the

70

00:03:06,869 --> 00:03:04,560

international space station the the

71

00:03:09,030 --> 00:03:06,879

commercial resupply services for both

72

00:03:11,110 --> 00:03:09,040

spacex and and the orbital team have

73

00:03:13,830 --> 00:03:11,120

been just doing a fantastic job for us

74

00:03:15,750 --> 00:03:13,840

so we're happy to uh be a big part of

75

00:03:17,190 --> 00:03:15,760

this mission and we're looking forward

76

00:03:19,110 --> 00:03:17,200

to the launch

77

00:03:20,470 --> 00:03:19,120

thank you thank you joel and now we're

78

00:03:23,190 --> 00:03:20,480

here from hans with an update from

79

00:03:25,270 --> 00:03:23,200

spacex good afternoon um i'm excited to

80

00:03:27,589 --> 00:03:25,280

be here um this is the uh

81

00:03:29,430 --> 00:03:27,599

our second dragon mission for this year

82

00:03:31,589 --> 00:03:29,440

and um and as always i'd like to thank

83

00:03:32,869 --> 00:03:31,599

nasa for the opportunity to supply the

84

00:03:34,789 --> 00:03:32,879

space station

85

00:03:38,149 --> 00:03:34,799

and in this case in particular i also

86

00:03:41,270 --> 00:03:38,159

want to like um to thank the faa and the

87

00:03:43,110 --> 00:03:41,280

45th space being the safety organization

88

00:03:44,710 --> 00:03:43,120

because we had a lot of work over the

89

00:03:47,110 --> 00:03:44,720

last couple of weeks

90

00:03:49,110 --> 00:03:47,120

to prepare for the uh for the land

91

00:03:51,110 --> 00:03:49,120

landing that you're going to perform

92

00:03:52,869 --> 00:03:51,120

this time

93

00:03:55,910 --> 00:03:52,879

i'm just coming from the static fire we

94

00:03:57,910 --> 00:03:55,920

uh started fire earlier today at uh i

95

00:03:59,670 --> 00:03:57,920

think it was 8 30

96

00:04:01,509 --> 00:03:59,680

we had operations going through the

97

00:04:03,429 --> 00:04:01,519

night um

98

00:04:05,270 --> 00:04:03,439

everything looks very good right now

99

00:04:06,550 --> 00:04:05,280

uh we're gonna have a data review um

100

00:04:08,789 --> 00:04:06,560

later today

101  
00:04:10,470 --> 00:04:08,799  
and uh and that's gonna gonna be a

102  
00:04:13,270 --> 00:04:10,480  
launch readiness review at the same time

103  
00:04:16,310 --> 00:04:13,280  
so i don't expect anything uh at this

104  
00:04:18,469 --> 00:04:16,320  
time other than a go for

105  
00:04:20,710 --> 00:04:18,479  
sunday to monday night

106  
00:04:22,950 --> 00:04:20,720  
the launch time is uh 45 minutes after

107  
00:04:24,790 --> 00:04:22,960  
midnight 45 minutes and 23 seconds i

108  
00:04:28,230 --> 00:04:24,800  
think currently

109  
00:04:30,629 --> 00:04:28,240  
we have a backup opportunity on

110  
00:04:32,629 --> 00:04:30,639  
i think it is tuesday night to wednesday

111  
00:04:35,189 --> 00:04:32,639  
on the 20th um

112  
00:04:37,510 --> 00:04:35,199  
and uh and that actually currently is 17

113  
00:04:39,270 --> 00:04:37,520

seconds after midnight so it might shift

114

00:04:42,070 --> 00:04:39,280

left to right a little bit and actually

115

00:04:44,150 --> 00:04:42,080

jump the day which would be pretty funny

116

00:04:46,629 --> 00:04:44,160

um this one also is interesting for us

117

00:04:49,350 --> 00:04:46,639

because we have um obviously monday here

118

00:04:51,830 --> 00:04:49,360

in florida and uh still sunday back in

119

00:04:53,189 --> 00:04:51,840

in california so i will see this book

120

00:04:54,830 --> 00:04:53,199

kept under two different dates in the

121

00:04:58,629 --> 00:04:54,840

future here

122

00:05:01,270 --> 00:04:58,639

um so seventh mission for this year uh

123

00:05:03,270 --> 00:05:01,280

basically and uh we've been ramping up

124

00:05:05,110 --> 00:05:03,280

the missions over um the last couple of

125

00:05:08,230 --> 00:05:05,120

months following um

126

00:05:11,029 --> 00:05:08,240

our um you know investigation

127

00:05:13,590 --> 00:05:11,039

uh i'm also really excited about ida and

128

00:05:16,629 --> 00:05:13,600

i know how critical this is for nasa and

129

00:05:18,950 --> 00:05:16,639

uh and the the the iss in general

130

00:05:21,350 --> 00:05:18,960

um and also of course for spacex um

131

00:05:23,749 --> 00:05:21,360

going forward with blue dragon so this

132

00:05:26,790 --> 00:05:23,759

is a really um a really important piece

133

00:05:28,230 --> 00:05:26,800

of hardware it's an external piece of

134

00:05:30,469 --> 00:05:28,240

an external

135

00:05:33,029 --> 00:05:30,479

payload which is in the trunk of drag

136

00:05:34,790 --> 00:05:33,039

and then needs to be pulled out with the

137

00:05:38,150 --> 00:05:34,800

station

138

00:05:40,790 --> 00:05:38,160

robotic arm

139

00:05:43,110 --> 00:05:40,800

so regarding land landing um

140

00:05:45,749 --> 00:05:43,120

you will you will see the first stage

141

00:05:47,749 --> 00:05:45,759

burn for about two minutes and 20

142

00:05:50,950 --> 00:05:47,759

seconds two and a half minutes roughly

143

00:05:54,550 --> 00:05:50,960

and when it shuts down and deploys the

144

00:05:56,309 --> 00:05:54,560

second stage uh you'll see probably

145

00:05:57,430 --> 00:05:56,319

if the weather is good of course um

146

00:05:59,270 --> 00:05:57,440

actually you don't see it because it's

147

00:06:01,270 --> 00:05:59,280

dark but if

148

00:06:02,790 --> 00:06:01,280

if you if it would be a daylight you

149

00:06:05,189 --> 00:06:02,800

would see the stage turning around and

150

00:06:06,870 --> 00:06:05,199

uh and doing a boost back burn

151  
00:06:08,070 --> 00:06:06,880  
that burn is pretty long it's a 40

152  
00:06:11,830 --> 00:06:08,080  
second

153  
00:06:13,430 --> 00:06:11,840  
stage

154  
00:06:15,909 --> 00:06:13,440  
followed by a

155  
00:06:19,270 --> 00:06:15,919  
an entry burn about

156  
00:06:22,550 --> 00:06:20,790  
after liftoff

157  
00:06:25,590 --> 00:06:22,560  
and then that is followed by a landing

158  
00:06:26,870 --> 00:06:25,600  
burn right around eight minutes um

159  
00:06:28,629 --> 00:06:26,880  
the landing

160  
00:06:31,670 --> 00:06:28,639  
is going to occur at landing zone one

161  
00:06:33,909 --> 00:06:31,680  
which is the old slick

162  
00:06:36,390 --> 00:06:33,919  
13 or 12 i forgot exactly which one it

163  
00:06:38,070 --> 00:06:36,400

is i think it's 12.

164

00:06:41,189 --> 00:06:38,080

down in the

165

00:06:43,350 --> 00:06:41,199

south south of the cape canaveral

166

00:06:45,590 --> 00:06:43,360

a couple miles away from the from the

167

00:06:47,270 --> 00:06:45,600

the launch site

168

00:06:49,510 --> 00:06:47,280

second stage continues for another six

169

00:06:51,830 --> 00:06:49,520

and a half minutes

170

00:06:54,390 --> 00:06:51,840

it will deploy the nose cone after about

171

00:06:56,950 --> 00:06:54,400

40 seconds to a minute

172

00:06:59,430 --> 00:06:56,960

and then dragon will be deployed about

173

00:07:00,950 --> 00:06:59,440

30 seconds after shut down and will be

174

00:07:03,189 --> 00:07:00,960

on its way to the station over the next

175

00:07:05,589 --> 00:07:03,199

couple two days actually

176  
00:07:08,230 --> 00:07:05,599  
and and then be birthed by the

177  
00:07:09,350 --> 00:07:08,240  
robotic arm again

178  
00:07:11,189 --> 00:07:09,360  
that's

179  
00:07:13,189 --> 00:07:11,199  
all i have right now i'm really excited

180  
00:07:17,189 --> 00:07:13,199  
again and

181  
00:07:18,550 --> 00:07:17,199  
and looking forward to this mission

182  
00:07:20,070 --> 00:07:18,560  
thank you hans we're really excited and

183  
00:07:21,670 --> 00:07:20,080  
looking forward to this mission as well

184  
00:07:23,110 --> 00:07:21,680  
now julie what can you tell us about the

185  
00:07:25,510 --> 00:07:23,120  
trailblazing science that we're sending

186  
00:07:26,870 --> 00:07:25,520  
to the international space station

187  
00:07:27,830 --> 00:07:26,880  
well dragon is a really important

188  
00:07:29,990 --> 00:07:27,840

vehicle

189

00:07:32,550 --> 00:07:30,000

for science because of its capabilities

190

00:07:35,350 --> 00:07:32,560

in launching live samples and also for

191

00:07:38,629 --> 00:07:35,360

its return capability so we have about

192

00:07:40,150 --> 00:07:38,639

930 kilograms of research samples going

193

00:07:42,790 --> 00:07:40,160

up and about

194

00:07:43,510 --> 00:07:42,800

580 kilograms of samples coming back

195

00:07:45,350 --> 00:07:43,520

home

196

00:07:48,309 --> 00:07:45,360

one of the things that i really notice

197

00:07:50,070 --> 00:07:48,319

across all the cargo on this flight and

198

00:07:51,589 --> 00:07:50,080

and it's supporting literally hundreds

199

00:07:53,589 --> 00:07:51,599

of investigations that are going on in

200

00:07:55,670 --> 00:07:53,599

the space station right now one of the

201  
00:07:57,749 --> 00:07:55,680  
things i notice is a number of studies

202  
00:07:59,110 --> 00:07:57,759  
that are looking at genetic gene

203  
00:08:01,270 --> 00:07:59,120  
expression

204  
00:08:03,589 --> 00:08:01,280  
proteomics and all of these

205  
00:08:05,510 --> 00:08:03,599  
molecular approaches to understanding

206  
00:08:07,670 --> 00:08:05,520  
life that are so important back here on

207  
00:08:09,430 --> 00:08:07,680  
earth in personalized medicine those are

208  
00:08:11,029 --> 00:08:09,440  
also being studied in space and it's

209  
00:08:13,670 --> 00:08:11,039  
interesting the kinds of samples that

210  
00:08:15,589 --> 00:08:13,680  
are included things like heart cells

211  
00:08:17,110 --> 00:08:15,599  
muscle cells

212  
00:08:19,189 --> 00:08:17,120  
bone cells

213  
00:08:20,710 --> 00:08:19,199

a mouse study looking at epigenetics

214

00:08:23,670 --> 00:08:20,720

which is being done for our japanese

215

00:08:25,990 --> 00:08:23,680

colleagues plant seedlings all of those

216

00:08:28,550 --> 00:08:26,000

are going to be studied in terms of

217

00:08:30,869 --> 00:08:28,560

their gene expression and and how being

218

00:08:32,310 --> 00:08:30,879

in space really affects those organisms

219

00:08:34,550 --> 00:08:32,320

also there are really interesting

220

00:08:36,469 --> 00:08:34,560

applied physical sciences such as

221

00:08:38,310 --> 00:08:36,479

studies of hard to wet surfaces being

222

00:08:40,709 --> 00:08:38,320

done by eli lilly

223

00:08:41,750 --> 00:08:40,719

studies of copper tin and copper silver

224

00:08:43,269 --> 00:08:41,760

alloys

225

00:08:44,870 --> 00:08:43,279

being done in collaboration with our

226

00:08:46,949 --> 00:08:44,880

european colleagues

227

00:08:48,389 --> 00:08:46,959

studies of phase change heat exchangers

228

00:08:50,150 --> 00:08:48,399

and a new facility that will let us

229

00:08:52,630 --> 00:08:50,160

continue to do new studies of how to

230

00:08:54,710 --> 00:08:52,640

better do thermal control in space

231

00:08:57,509 --> 00:08:54,720

and one and another interesting thing

232

00:08:59,670 --> 00:08:57,519

that's going up is an instrument to help

233

00:09:01,590 --> 00:08:59,680

in managing maritime traffic back here

234

00:09:02,870 --> 00:09:01,600

on earth we'll have a briefing tomorrow

235

00:09:04,870 --> 00:09:02,880

with some of these scientists to tell

236

00:09:07,269 --> 00:09:04,880

you about some of their work but from an

237

00:09:09,430 --> 00:09:07,279

overall perspective this is just part of

238

00:09:11,750 --> 00:09:09,440

the rich stream of research going on in

239

00:09:14,949 --> 00:09:11,760

the space station from human research

240

00:09:17,670 --> 00:09:14,959

biology physical science investigations

241

00:09:19,509 --> 00:09:17,680

and things for exploration technology

242

00:09:20,870 --> 00:09:19,519

thanks

243

00:09:23,829 --> 00:09:20,880

thank you julie it's pretty incredible

244

00:09:25,350 --> 00:09:23,839

we're able to accomplish up there

245

00:09:26,389 --> 00:09:25,360

now laura how is the weather looking for

246

00:09:28,470 --> 00:09:26,399

this launch

247

00:09:30,150 --> 00:09:28,480

it's looking pretty good cheryl

248

00:09:32,630 --> 00:09:30,160

first let's take a look at the satellite

249

00:09:35,430 --> 00:09:32,640

imagery you can see the high pressure

250

00:09:37,350 --> 00:09:35,440

center over the atlantic ocean has a

251  
00:09:38,550 --> 00:09:37,360  
ridge access extending into central

252  
00:09:40,630 --> 00:09:38,560  
florida

253  
00:09:42,870 --> 00:09:40,640  
this ridge access is causing

254  
00:09:45,750 --> 00:09:42,880  
southeasterly wind flow today

255  
00:09:47,269 --> 00:09:45,760  
and is expected to push north over

256  
00:09:49,990 --> 00:09:47,279  
northern florida tomorrow which will

257  
00:09:51,590 --> 00:09:50,000  
cause more easterly flow sunday night

258  
00:09:54,630 --> 00:09:51,600  
into early next week

259  
00:09:56,070 --> 00:09:54,640  
you can also see the sea breeze

260  
00:09:58,230 --> 00:09:56,080  
the east coast sea breeze progressing

261  
00:09:59,990 --> 00:09:58,240  
inland as well as triggering triggering

262  
00:10:02,630 --> 00:10:00,000  
afternoon thunderstorms

263  
00:10:05,110 --> 00:10:02,640

and with the onshore flow being stronger

264

00:10:07,030 --> 00:10:05,120

tomorrow we're expecting those afternoon

265

00:10:09,269 --> 00:10:07,040

to evening thunderstorms to progress

266

00:10:12,150 --> 00:10:09,279

west of the spaceport

267

00:10:14,230 --> 00:10:12,160

and on sunday over the mid and upper

268

00:10:16,630 --> 00:10:14,240

levels we're expecting high pressure to

269

00:10:18,630 --> 00:10:16,640

build over the central united states

270

00:10:20,630 --> 00:10:18,640

with the building high pressure center

271

00:10:23,110 --> 00:10:20,640

we're expecting relatively light winds

272

00:10:25,350 --> 00:10:23,120

aloft out of the northeast and again

273

00:10:28,069 --> 00:10:25,360

with that northeasterly flow it'll keep

274

00:10:29,829 --> 00:10:28,079

all convective activity well west of

275

00:10:31,670 --> 00:10:29,839

florida's east coast

276  
00:10:34,069 --> 00:10:31,680  
as we take a look at the launch forecast

277  
00:10:36,710 --> 00:10:34,079  
you can see that we are going for just

278  
00:10:39,030 --> 00:10:36,720  
few to scattered skies and no

279  
00:10:40,310 --> 00:10:39,040  
significant restrictions to visibility

280  
00:10:43,030 --> 00:10:40,320  
the winds will be light out of the

281  
00:10:45,829 --> 00:10:43,040  
southeast and the winds will be off the

282  
00:10:48,630 --> 00:10:45,839  
ocean which will cause the overnight

283  
00:10:50,389 --> 00:10:48,640  
temperatures to remain in the lower 80s

284  
00:10:53,030 --> 00:10:50,399  
because the launch time is just prior to

285  
00:10:54,710 --> 00:10:53,040  
1am we're expecting the majority of the

286  
00:10:57,269 --> 00:10:54,720  
daytime and evening thunderstorms to

287  
00:10:59,110 --> 00:10:57,279  
have dissipated over

288  
00:11:01,190 --> 00:10:59,120

central and western florida and the

289

00:11:03,190 --> 00:11:01,200

cumulus clouds and

290

00:11:05,829 --> 00:11:03,200

overnight showers that we typically see

291

00:11:08,470 --> 00:11:05,839

in the easterly flow regime

292

00:11:10,470 --> 00:11:08,480

will not really develop until after 4 am

293

00:11:11,910 --> 00:11:10,480

extending into

294

00:11:15,350 --> 00:11:11,920

just prior to

295

00:11:17,030 --> 00:11:15,360

noon on monday therefore the probability

296

00:11:18,630 --> 00:11:17,040

of violation

297

00:11:21,590 --> 00:11:18,640

will be low

298

00:11:23,190 --> 00:11:21,600

at launch time at 10 percent and this

299

00:11:25,350 --> 00:11:23,200

would just be due to the cumulus cloud

300

00:11:26,150 --> 00:11:25,360

rule and the dragon capsules flight

301  
00:11:28,790 --> 00:11:26,160  
through

302  
00:11:30,389 --> 00:11:28,800  
precipitation rule since the conditions

303  
00:11:32,710 --> 00:11:30,399  
are not changing

304  
00:11:36,230 --> 00:11:32,720  
for the first stage flyback and landing

305  
00:11:37,590 --> 00:11:36,240  
we have no additional weather concerns

306  
00:11:39,110 --> 00:11:37,600  
regarding

307  
00:11:41,750 --> 00:11:39,120  
violations

308  
00:11:43,670 --> 00:11:41,760  
in the event of a delay so a launch

309  
00:11:45,110 --> 00:11:43,680  
tuesday around midnight into wednesday

310  
00:11:47,509 --> 00:11:45,120  
morning we expect similar weather

311  
00:11:49,990 --> 00:11:47,519  
conditions as a first attempt the only

312  
00:11:52,310 --> 00:11:50,000  
real change in the weather pattern is

313  
00:11:54,870 --> 00:11:52,320

the potential for a tropical easterly

314

00:11:57,350 --> 00:11:54,880

wave to progress through the pattern

315

00:11:59,030 --> 00:11:57,360

and these easterly waves may enhance the

316

00:12:01,750 --> 00:11:59,040

nocturnal

317

00:12:03,590 --> 00:12:01,760

cumulus clouds and showers as well as

318

00:12:04,629 --> 00:12:03,600

increase the cloud coverage over the

319

00:12:06,470 --> 00:12:04,639

area

320

00:12:07,430 --> 00:12:06,480

therefore the thick cloud rule has been

321

00:12:09,990 --> 00:12:07,440

added

322

00:12:12,230 --> 00:12:10,000

as a primary weather concern and the

323

00:12:14,629 --> 00:12:12,240

probability of violation increases to 30

324

00:12:16,550 --> 00:12:14,639

percent for tuesday night

325

00:12:19,910 --> 00:12:16,560

so overall we expect

326

00:12:22,310 --> 00:12:19,920

just few to maybe scattered clouds for

327

00:12:23,990 --> 00:12:22,320

the launch time with

328

00:12:25,750 --> 00:12:24,000

a full moon out as well so if you're

329

00:12:27,030 --> 00:12:25,760

able to i hope you're

330

00:12:29,269 --> 00:12:27,040

going to come out and watch the launch

331

00:12:31,190 --> 00:12:29,279

that's all i got cheryl

332

00:12:33,269 --> 00:12:31,200

thank you laura and now we hope now we

333

00:12:35,030 --> 00:12:33,279

will hear from our final speaker cody

334

00:12:37,190 --> 00:12:35,040

with an update on the range

335

00:12:39,350 --> 00:12:37,200

thanks cheryl good afternoon ladies and

336

00:12:41,509 --> 00:12:39,360

gentlemen uh we're targeting launch of

337

00:12:43,350 --> 00:12:41,519

the ninth spacex commercial resupply

338

00:12:46,230 --> 00:12:43,360

mission for nasa to the international

339

00:12:48,870 --> 00:12:46,240

space station for 12 45 a.m eastern

340

00:12:51,350 --> 00:12:48,880

daylight time that's local in advance to

341

00:12:54,949 --> 00:12:51,360

the launch the 45th space wing provided

342

00:12:57,269 --> 00:12:54,959

ksc with a risk analysis on that was

343

00:12:59,670 --> 00:12:57,279

provided to us yesterday

344

00:13:01,190 --> 00:12:59,680

we determined we're go for launch there

345

00:13:03,829 --> 00:13:01,200

are a number of safety assessments

346

00:13:05,030 --> 00:13:03,839

performed by the wing and evaluated by

347

00:13:06,710 --> 00:13:05,040

nasa

348

00:13:08,550 --> 00:13:06,720

before each mission

349

00:13:10,710 --> 00:13:08,560

uh national range safety engineers here

350

00:13:12,470 --> 00:13:10,720

at ksc accepted the current risk

351  
00:13:14,629 --> 00:13:12,480  
assessment which required taking some

352  
00:13:16,150 --> 00:13:14,639  
mitigating actions for debris and toxic

353  
00:13:18,069 --> 00:13:16,160  
dispersion risks

354  
00:13:20,870 --> 00:13:18,079  
these actions included clearing a number

355  
00:13:22,629 --> 00:13:20,880  
of nasa facilities here at ksc within

356  
00:13:23,509 --> 00:13:22,639  
the hazard launch air hazardous launch

357  
00:13:25,990 --> 00:13:23,519  
area

358  
00:13:28,949 --> 00:13:26,000  
the brevard county community outside of

359  
00:13:30,710 --> 00:13:28,959  
ksc was not affected however

360  
00:13:32,470 --> 00:13:30,720  
any facility within the launch hazard

361  
00:13:34,870 --> 00:13:32,480  
area this includes the press site will

362  
00:13:36,870 --> 00:13:34,880  
need be needed cleared at 60 minutes

363  
00:13:38,470 --> 00:13:36,880

prior to the launch time

364

00:13:40,230 --> 00:13:38,480

the dispersion risk

365

00:13:42,230 --> 00:13:40,240

for this launch is driven predominantly

366

00:13:44,870 --> 00:13:42,240

by the onshore winds present this time

367

00:13:46,790 --> 00:13:44,880

of year the analysis is performed based

368

00:13:48,790 --> 00:13:46,800

on the forecasted weather data and will

369

00:13:50,389 --> 00:13:48,800

be refined as we move closer to the

370

00:13:52,069 --> 00:13:50,399

launch time

371

00:13:54,150 --> 00:13:52,079

following this assessment we'll continue

372

00:13:56,310 --> 00:13:54,160

to work closely with the wing to refine

373

00:13:59,189 --> 00:13:56,320

and fully understand the

374

00:14:00,790 --> 00:13:59,199

toxic dispersion modeling present

375

00:14:02,550 --> 00:14:00,800

and we'll work

376

00:14:04,230 --> 00:14:02,560

toward making sure everybody has an

377

00:14:06,629 --> 00:14:04,240

exciting and wonderful view of the skies

378

00:14:08,470 --> 00:14:06,639

tomorrow night joe

379

00:14:10,230 --> 00:14:08,480

thank you cody we'll now move into our

380

00:14:11,670 --> 00:14:10,240

question and answer session we will

381

00:14:12,949 --> 00:14:11,680

begin with questions in the room so if

382

00:14:14,870 --> 00:14:12,959

you have a question please raise your

383

00:14:16,389 --> 00:14:14,880

hand we will take questions after that

384

00:14:18,790 --> 00:14:16,399

from the phone line again to enter the

385

00:14:21,030 --> 00:14:18,800

queue please press star one at any time

386

00:14:23,430 --> 00:14:21,040

and to ask questions online please use

387

00:14:26,389 --> 00:14:23,440

the hashtag asknasa we'll begin with

388

00:14:29,990 --> 00:14:28,790

hi bill harwood with cbs news for cody

389

00:14:32,069 --> 00:14:30,000

can you go into a little more detail

390

00:14:33,910 --> 00:14:32,079

about uh

391

00:14:35,829 --> 00:14:33,920

this is obviously i guess for spacex

392

00:14:37,110 --> 00:14:35,839

dragon abort scenarios and and the

393

00:14:38,710 --> 00:14:37,120

toxics that are onboard the dragon

394

00:14:40,470 --> 00:14:38,720

capsule if there was an abort would you

395

00:14:42,150 --> 00:14:40,480

just talk about that and what could get

396

00:14:44,870 --> 00:14:42,160

released or maybe that's a heinz

397

00:14:46,230 --> 00:14:44,880

question i don't know but um

398

00:14:47,910 --> 00:14:46,240

just

399

00:14:51,030 --> 00:14:47,920

go through the analysis for me so i can

400

00:14:53,189 --> 00:14:51,040

speak to the analysis provided to nasa

401  
00:14:55,430 --> 00:14:53,199  
by the 45th space wing

402  
00:14:58,310 --> 00:14:55,440  
what we're looking at is in the event of

403  
00:15:00,629 --> 00:14:58,320  
a dragon abort scenario the predominant

404  
00:15:03,110 --> 00:15:00,639  
winds would carry the spacecraft back

405  
00:15:04,790 --> 00:15:03,120  
toward ksc property

406  
00:15:10,389 --> 00:15:04,800  
the

407  
00:15:12,710 --> 00:15:10,399  
could see a risk of releasing its toxic

408  
00:15:14,550 --> 00:15:12,720  
commodities as such we need to take

409  
00:15:16,790 --> 00:15:14,560  
actions to ensure that

410  
00:15:18,150 --> 00:15:16,800  
our people the viewing public as well as

411  
00:15:20,389 --> 00:15:18,160  
as visiting

412  
00:15:22,870 --> 00:15:20,399  
guests are kept safe so we thought it

413  
00:15:25,189 --> 00:15:22,880

prudent to move

414

00:15:27,990 --> 00:15:25,199

visitors outside the areas of highest

415

00:15:28,870 --> 00:15:28,000

risk due to the winds and uh i'm not

416

00:15:30,949 --> 00:15:28,880

sure if

417

00:15:33,110 --> 00:15:30,959

we could speak to the the actual

418

00:15:34,629 --> 00:15:33,120

commodities on board of the spacex

419

00:15:36,230 --> 00:15:34,639

dragon capsule but

420

00:15:37,350 --> 00:15:36,240

that question what are the commodities

421

00:15:39,269 --> 00:15:37,360

we're talking about i mean i think i

422

00:15:41,110 --> 00:15:39,279

know what they are but you'd explain it

423

00:15:43,749 --> 00:15:41,120

but what's going to be different on a

424

00:15:44,870 --> 00:15:43,759

manned a piloted version of the dragon

425

00:15:46,069 --> 00:15:44,880

because obviously you're not going to

426

00:15:48,310 --> 00:15:46,079

have people on board if there's any

427

00:15:49,509 --> 00:15:48,320

chance of a risk of letting consumables

428

00:15:50,790 --> 00:15:49,519

like this get loose so maybe the

429

00:15:53,110 --> 00:15:50,800

difference between

430

00:15:54,389 --> 00:15:53,120

cargo ship manship in this context

431

00:15:55,350 --> 00:15:54,399

thanks

432

00:15:57,430 --> 00:15:55,360

so

433

00:15:59,110 --> 00:15:57,440

on dragon nothing is different from the

434

00:16:00,230 --> 00:15:59,120

last flight i'd like to point that out

435

00:16:04,389 --> 00:16:00,240

we

436

00:16:06,470 --> 00:16:04,399

and

437

00:16:09,110 --> 00:16:06,480

there those are those are

438

00:16:10,870 --> 00:16:09,120

toxic so um i understand the precaution

439

00:16:13,430 --> 00:16:10,880

on the ranger side the wind is in

440

00:16:17,189 --> 00:16:13,440

unfavorable direction but on the dragon

441

00:16:18,949 --> 00:16:17,199

side um nothing changed over over the

442

00:16:21,110 --> 00:16:18,959

last couple of years in terms of design

443

00:16:23,749 --> 00:16:21,120

or anything in terms of

444

00:16:26,310 --> 00:16:23,759

risk to to the public here and um from

445

00:16:28,470 --> 00:16:26,320

the design perspective uh in terms of uh

446

00:16:30,150 --> 00:16:28,480

crew dragon totally different situation

447

00:16:32,870 --> 00:16:30,160

cool dragon has an integrated board

448

00:16:35,670 --> 00:16:32,880

system so um it's going to be in case of

449

00:16:38,949 --> 00:16:35,680

of any um mishap uh the capsule would

450

00:16:41,189 --> 00:16:38,959

basically save itself and the astronauts

451  
00:16:42,710 --> 00:16:41,199  
and um and it would not get into the

452  
00:16:45,269 --> 00:16:42,720  
situation where you would impact the

453  
00:16:46,230 --> 00:16:45,279  
ground um potentially it would rather

454  
00:16:48,389 --> 00:16:46,240  
land

455  
00:16:50,230 --> 00:16:48,399  
safely on the ground after

456  
00:16:51,829 --> 00:16:50,240  
you know pulling out and and going to a

457  
00:16:56,069 --> 00:16:51,839  
safe distance it's a very different

458  
00:16:57,990 --> 00:16:56,079  
situation uh to this cargo dragon but um

459  
00:17:00,870 --> 00:16:58,000  
i actually think all these um

460  
00:17:03,269 --> 00:17:00,880  
precautions and the risk are really um

461  
00:17:04,949 --> 00:17:03,279  
i really appreciate that the range um

462  
00:17:07,909 --> 00:17:04,959  
working with us in particular not just

463  
00:17:10,870 --> 00:17:07,919

on on the dragon side but also on the um

464

00:17:13,350 --> 00:17:10,880

the landing side um we had uh we had a

465

00:17:16,710 --> 00:17:13,360

really uh fruitful cooperation with

466

00:17:19,829 --> 00:17:16,720

range safety uh 45th space wing here

467

00:17:21,829 --> 00:17:19,839

to to to enable the land landing and uh

468

00:17:24,789 --> 00:17:21,839

make sure that we do this in a safe way

469

00:17:27,590 --> 00:17:24,799

without any risk to the public

470

00:17:30,870 --> 00:17:27,600

great next question from irene

471

00:17:33,270 --> 00:17:30,880

hi thank you irene klotz with reuters um

472

00:17:34,470 --> 00:17:33,280

hans just to be clear the changes that

473

00:17:36,070 --> 00:17:34,480

were made

474

00:17:38,150 --> 00:17:36,080

to have a

475

00:17:39,350 --> 00:17:38,160

to be able to recover dragon in case of

476

00:17:41,350 --> 00:17:39,360

an accident

477

00:17:43,990 --> 00:17:41,360

that would be for a parachute landing at

478

00:17:46,789 --> 00:17:44,000

sea and this whole scenario driving the

479

00:17:49,430 --> 00:17:46,799

evacuation of the press site is in case

480

00:17:50,710 --> 00:17:49,440

that system didn't work and it landed on

481

00:17:52,230 --> 00:17:50,720

land

482

00:17:53,830 --> 00:17:52,240

no i don't think these are related i

483

00:17:55,669 --> 00:17:53,840

think the um

484

00:17:57,669 --> 00:17:55,679

what you're referring to is one of the

485

00:17:59,270 --> 00:17:57,679

changes we implemented after

486

00:18:01,190 --> 00:17:59,280

um the mishap um where we could

487

00:18:03,669 --> 00:18:01,200

basically have saved dragon by deploying

488

00:18:04,549 --> 00:18:03,679

the parachutes um and that's uh

489

00:18:06,390 --> 00:18:04,559

we've

490

00:18:08,390 --> 00:18:06,400

implemented that that particular change

491

00:18:10,549 --> 00:18:08,400

uh from now on but you need to get to a

492

00:18:12,150 --> 00:18:10,559

certain altitude in order to pull the uh

493

00:18:14,390 --> 00:18:12,160

the parachutes out

494

00:18:16,150 --> 00:18:14,400

and there's an initial phase early on

495

00:18:17,990 --> 00:18:16,160

where you might not be able to to do

496

00:18:19,590 --> 00:18:18,000

this so it's going to be enabled um

497

00:18:21,750 --> 00:18:19,600

later on i don't think it's it is

498

00:18:24,390 --> 00:18:21,760

related to that particular scenario okay

499

00:18:27,029 --> 00:18:24,400

thanks and um for joel um does the

500

00:18:29,830 --> 00:18:27,039

progress need to be docked um before

501

00:18:30,870 --> 00:18:29,840

spacex is clear to launch

502

00:18:33,669 --> 00:18:30,880

no

503

00:18:35,590 --> 00:18:33,679

so what we'll do is if progress progress

504

00:18:38,710 --> 00:18:35,600

is going to launch in dock and then

505

00:18:42,310 --> 00:18:40,630

if if progress had an issue but right

506

00:18:43,669 --> 00:18:42,320

now progress is you know there's

507

00:18:44,470 --> 00:18:43,679

progress is going to be docked monday

508

00:18:47,029 --> 00:18:44,480

night

509

00:18:49,270 --> 00:18:47,039

and so there's no constraint to spacex

510

00:18:52,789 --> 00:18:49,280

launch to the progress docking

511

00:18:54,870 --> 00:18:52,799

how long could spacex loiter

512

00:18:58,390 --> 00:18:54,880

uh i don't have

513

00:19:00,070 --> 00:18:58,400

you have the uh the number of days um

514

00:19:02,390 --> 00:19:00,080

it's probably driven more by your

515

00:19:03,990 --> 00:19:02,400

payload than by our spacecraft we could

516

00:19:05,669 --> 00:19:04,000

you could later for uh loider for a

517

00:19:07,510 --> 00:19:05,679

couple of days but i think there's a

518

00:19:08,870 --> 00:19:07,520

payload time limit

519

00:19:11,590 --> 00:19:08,880

on board

520

00:19:13,110 --> 00:19:11,600

irene we can follow up with you okay

521

00:19:15,029 --> 00:19:13,120

all right next question

522

00:19:18,789 --> 00:19:15,039

in the yellow please

523

00:19:20,870 --> 00:19:18,799

marcia done associated press for hans

524

00:19:23,350 --> 00:19:20,880

oh

525

00:19:24,390 --> 00:19:23,360

hans here yeah

526

00:19:25,909 --> 00:19:24,400

oh sorry

527

00:19:28,230 --> 00:19:25,919

um i'm wondering

528

00:19:31,350 --> 00:19:28,240

do you have a target date yet for your

529

00:19:33,669 --> 00:19:31,360

first um recycled rocket launch um and

530

00:19:35,669 --> 00:19:33,679

what are you doing to the booster to

531

00:19:37,430 --> 00:19:35,679

if anything yet to get it ready to fly

532

00:19:39,350 --> 00:19:37,440

in and if you could provide a little

533

00:19:40,789 --> 00:19:39,360

update too on the status of your crew

534

00:19:42,070 --> 00:19:40,799

crew dragon and how that's going and

535

00:19:44,390 --> 00:19:42,080

whether you think you can still make

536

00:19:47,029 --> 00:19:44,400

next year for a lunch

537

00:19:49,270 --> 00:19:47,039

okay so um first on the uh

538

00:19:50,470 --> 00:19:49,280

reflight of the recovered booster um

539

00:19:53,669 --> 00:19:50,480

that's going to be

540

00:19:55,750 --> 00:19:53,679

most likely in fall this year we are um

541

00:19:57,750 --> 00:19:55,760

you're prepping the booster again um and

542

00:19:58,789 --> 00:19:57,760

we well first of all we got to wash them

543

00:20:00,870 --> 00:19:58,799

right

544

00:20:01,990 --> 00:20:00,880

they come back slightly slightly

545

00:20:02,950 --> 00:20:02,000

blackened

546

00:20:03,909 --> 00:20:02,960

um

547

00:20:07,110 --> 00:20:03,919

and

548

00:20:08,789 --> 00:20:07,120

of tests with the hardware on on the

549

00:20:11,029 --> 00:20:08,799

boost itself to make sure

550

00:20:13,350 --> 00:20:11,039

everything's working everything's uh is

551  
00:20:15,669 --> 00:20:13,360  
functioning we also have a parallel test

552  
00:20:17,350 --> 00:20:15,679  
program running to make sure that um the

553  
00:20:19,430 --> 00:20:17,360  
booster is qualified for multiple

554  
00:20:21,909 --> 00:20:19,440  
reflights so that is something that we

555  
00:20:23,510 --> 00:20:21,919  
need to close out before we fly

556  
00:20:28,710 --> 00:20:23,520  
um

557  
00:20:30,789 --> 00:20:28,720  
have a customer we are in talks right

558  
00:20:33,909 --> 00:20:30,799  
now but we need uh we haven't finalized

559  
00:20:35,590 --> 00:20:33,919  
those talks um at this point in time but

560  
00:20:37,669 --> 00:20:35,600  
my my guess on this would be it's going

561  
00:20:39,110 --> 00:20:37,679  
to be in in fall um

562  
00:20:41,990 --> 00:20:39,120  
of this year

563  
00:20:44,070 --> 00:20:42,000

um second question was on crew dragon um

564

00:20:45,590 --> 00:20:44,080

i believe you're on track um right now

565

00:20:47,190 --> 00:20:45,600

on the uh

566

00:20:49,350 --> 00:20:47,200

on the demo mission

567

00:20:51,590 --> 00:20:49,360

um at least on the

568

00:20:52,789 --> 00:20:51,600

on i'm somewhat familiar with the the

569

00:20:55,110 --> 00:20:52,799

first one

570

00:20:57,270 --> 00:20:55,120

i'm not sure i'm i'm too familiar on

571

00:20:59,029 --> 00:20:57,280

what comes after that so um

572

00:21:00,390 --> 00:20:59,039

from what i know on the first dragon

573

00:21:02,630 --> 00:21:00,400

mission we are

574

00:21:05,190 --> 00:21:02,640

doing a lot of work right now

575

00:21:07,990 --> 00:21:05,200

everything is uh is going a lot of

576

00:21:10,230 --> 00:21:08,000

resources are going into dragon to um to

577

00:21:12,789 --> 00:21:10,240

push the crew vehicle and to make sure

578

00:21:15,430 --> 00:21:12,799

it's uh it's ready to go by by mid next

579

00:21:18,070 --> 00:21:16,630

thank you and it looks like we have a

580

00:21:20,390 --> 00:21:18,080

number of questions if you can please

581

00:21:21,909 --> 00:21:20,400

keep your question limit to one at this

582

00:21:26,789 --> 00:21:21,919

time and i believe we're going to go to

583

00:21:26,799 --> 00:21:36,230

go ahead with the phone line

584

00:21:41,190 --> 00:21:38,710

all right james dean

585

00:21:43,029 --> 00:21:41,200

oh thanks and um yeah i'm sorry i've

586

00:21:44,789 --> 00:21:43,039

missed a couple of spots here so forgive

587

00:21:46,789 --> 00:21:44,799

me if you've answered this already but

588

00:21:49,430 --> 00:21:46,799

just trying to clarify again if the

589

00:21:52,230 --> 00:21:49,440

evacuation of certain parts of ksc is

590

00:21:55,350 --> 00:21:52,240

related at all to the booster return

591

00:21:56,549 --> 00:21:55,360

or it's exclusively a dragon risk that's

592

00:21:58,710 --> 00:21:56,559

been

593

00:22:02,230 --> 00:21:58,720

evaluated here

594

00:22:05,110 --> 00:22:02,240

i'm assuming that was directed to me the

595

00:22:07,110 --> 00:22:05,120

uh the return of the booster does not

596

00:22:08,950 --> 00:22:07,120

introduce any additional risks beyond

597

00:22:11,590 --> 00:22:08,960

that we normally see with a return

598

00:22:14,310 --> 00:22:11,600

mission to uh the

599

00:22:16,549 --> 00:22:14,320

landing site won with spacex the

600

00:22:18,710 --> 00:22:16,559

evacuation and clearing of some of the

601

00:22:21,669 --> 00:22:18,720

viewing areas here at ksc is driven by

602

00:22:23,830 --> 00:22:21,679

again the dragon abort scenario

603

00:22:27,190 --> 00:22:23,840

okay thank you so much and uh hans could

604

00:22:28,549 --> 00:22:27,200

you just discuss your um

605

00:22:30,710 --> 00:22:28,559

i guess again you know your what you

606

00:22:32,710 --> 00:22:30,720

think are the chances of success of a

607

00:22:34,950 --> 00:22:32,720

booster landing this time around

608

00:22:37,270 --> 00:22:34,960

and um you know given that uh i guess

609

00:22:39,029 --> 00:22:37,280

land is considered a little more

610

00:22:40,710 --> 00:22:39,039

favorable than the drone ship right and

611

00:22:43,190 --> 00:22:40,720

um now that you have a few under your

612

00:22:44,630 --> 00:22:43,200

belt how are you uh feeling about this

613

00:22:49,669 --> 00:22:44,640

next opportunity

614

00:22:51,830 --> 00:22:49,679

yeah so i mean um the land landing is um

615

00:22:54,230 --> 00:22:51,840

it doesn't move

616

00:22:57,590 --> 00:22:54,240

it's one one advantage and it's actually

617

00:22:59,190 --> 00:22:57,600

slightly uh it's significantly bigger um

618

00:23:01,029 --> 00:22:59,200

it's a it's a pretty good good sized

619

00:23:02,630 --> 00:23:01,039

landing pad compared to the uh the drone

620

00:23:03,990 --> 00:23:02,640

ship and it doesn't have

621

00:23:06,390 --> 00:23:04,000

um

622

00:23:09,270 --> 00:23:06,400

uh doesn't have structure left and right

623

00:23:10,950 --> 00:23:09,280

that you need to fit the vehicle in so

624

00:23:12,870 --> 00:23:10,960

um from that perspective that that's

625

00:23:15,110 --> 00:23:12,880

going to be easier um getting back to

626

00:23:16,789 --> 00:23:15,120

land this uh requires a little bit more

627

00:23:19,350 --> 00:23:16,799

propellant um

628

00:23:21,350 --> 00:23:19,360

significantly more per pound rather

629

00:23:22,950 --> 00:23:21,360

but at the at the end of the day those

630

00:23:23,990 --> 00:23:22,960

trajectories are

631

00:23:25,990 --> 00:23:24,000

also

632

00:23:28,950 --> 00:23:26,000

easier or more benign in terms of heat

633

00:23:30,230 --> 00:23:28,960

load and deceleration so from that

634

00:23:32,789 --> 00:23:30,240

perspective

635

00:23:36,149 --> 00:23:32,799

i think it's going to be

636

00:23:38,470 --> 00:23:36,159

an easier trajectory than the last one

637

00:23:40,710 --> 00:23:38,480

obviously um the these landings are

638

00:23:41,510 --> 00:23:40,720

secondary in nature um

639

00:23:43,830 --> 00:23:41,520

and

640

00:23:46,390 --> 00:23:43,840

not not the main mission uh main mission

641

00:23:47,590 --> 00:23:46,400

is to bring cargo to the to the space

642

00:23:49,190 --> 00:23:47,600

station so

643

00:23:51,830 --> 00:23:49,200

um

644

00:23:53,750 --> 00:23:51,840

thanks uh i'm pretty optimistic uh at

645

00:23:55,750 --> 00:23:53,760

this point in time um

646

00:23:57,510 --> 00:23:55,760

that we we landed but uh i would always

647

00:23:59,430 --> 00:23:57,520

knock on but um

648

00:24:01,430 --> 00:23:59,440

just just by the nature of this this

649

00:24:02,549 --> 00:24:01,440

maneuver it's pretty uh

650

00:24:03,750 --> 00:24:02,559

um

651  
00:24:04,390 --> 00:24:03,760  
it's pretty challenging that's it this

652  
00:24:05,990 --> 00:24:04,400  
way

653  
00:24:08,070 --> 00:24:06,000  
and i also want to

654  
00:24:09,990 --> 00:24:08,080  
take the chance and go back on the what

655  
00:24:11,830 --> 00:24:10,000  
i said earlier about dragon i actually

656  
00:24:15,029 --> 00:24:11,840  
don't know what particular about

657  
00:24:15,990 --> 00:24:15,039  
scenario you drove that analysis um

658  
00:24:39,190 --> 00:24:16,000  
i

659  
00:24:41,430 --> 00:24:39,200  
northeast astronomy forum um for for

660  
00:24:43,029 --> 00:24:41,440  
hunts i have a question uh about also

661  
00:24:45,269 --> 00:24:43,039  
the other recovered boosters the ones

662  
00:24:46,390 --> 00:24:45,279  
the gto they landed a little bit hard

663  
00:24:48,230 --> 00:24:46,400

two of them and i don't think you're

664

00:24:49,830 --> 00:24:48,240

going to be able to reuse them and the

665

00:24:51,990 --> 00:24:49,840

last one um

666

00:24:53,590 --> 00:24:52,000

didn't land successfully

667

00:24:55,590 --> 00:24:53,600

what are you learning from these hard

668

00:24:57,110 --> 00:24:55,600

landings that you might be able to apply

669

00:24:59,909 --> 00:24:57,120

you're going to be changing

670

00:25:01,269 --> 00:24:59,919

the structure or any work on the on the

671

00:25:04,549 --> 00:25:01,279

falcon 9

672

00:25:06,470 --> 00:25:04,559

and um any change in the actual landing

673

00:25:08,549 --> 00:25:06,480

scenario how you do the landing what

674

00:25:10,230 --> 00:25:08,559

what you've learned

675

00:25:11,269 --> 00:25:10,240

from these hard landings

676  
00:25:14,710 --> 00:25:11,279  
so

677  
00:25:16,230 --> 00:25:14,720  
um there's a certain

678  
00:25:17,590 --> 00:25:16,240  
the the the

679  
00:25:19,430 --> 00:25:17,600  
primary there's no structural changes

680  
00:25:20,710 --> 00:25:19,440  
first of all you know and and in general

681  
00:25:23,669 --> 00:25:20,720  
i think the landing concept with the

682  
00:25:26,950 --> 00:25:23,679  
legs and uh and the number of burns and

683  
00:25:28,789 --> 00:25:26,960  
um the way we um perform those um seems

684  
00:25:30,789 --> 00:25:28,799  
to work okay

685  
00:25:33,269 --> 00:25:30,799  
the key thing is to protect the engines

686  
00:25:35,110 --> 00:25:33,279  
and make sure that they start up well

687  
00:25:37,190 --> 00:25:35,120  
and in particular the hot

688  
00:25:39,669 --> 00:25:37,200

trajectory so to speak or the one that

689

00:25:42,149 --> 00:25:39,679

can come in after a

690

00:25:45,029 --> 00:25:42,159

really fast payload like the geotrans uh

691

00:25:47,190 --> 00:25:45,039

geotransfer payloads basically um those

692

00:25:49,510 --> 00:25:47,200

those engines need to be protected such

693

00:25:51,269 --> 00:25:49,520

that they start up in in the proper way

694

00:25:53,110 --> 00:25:51,279

and that is something that we learned

695

00:25:54,470 --> 00:25:53,120

you learn a lot by

696

00:25:57,029 --> 00:25:54,480

you know even on the on the missions

697

00:25:59,269 --> 00:25:57,039

when things go wrong um like on on you

698

00:26:01,190 --> 00:25:59,279

know on the landing rather everything

699

00:26:03,110 --> 00:26:01,200

goes well on the main mission of course

700

00:26:04,950 --> 00:26:03,120

that's actually something that um always

701  
00:26:07,029 --> 00:26:04,960  
bugs me we have successful deploy and

702  
00:26:08,310 --> 00:26:07,039  
everything's fine and uh and then the

703  
00:26:10,390 --> 00:26:08,320  
landing doesn't quite work and the

704  
00:26:11,430 --> 00:26:10,400  
landing gets all the attention there but

705  
00:26:13,190 --> 00:26:11,440  
um

706  
00:26:15,669 --> 00:26:13,200  
even even on those landings we learn we

707  
00:26:18,390 --> 00:26:15,679  
learn a lot and uh we

708  
00:26:19,590 --> 00:26:18,400  
we learned particularly on the last last

709  
00:26:21,669 --> 00:26:19,600  
landing

710  
00:26:23,990 --> 00:26:21,679  
we believe we found we found a way to

711  
00:26:25,669 --> 00:26:24,000  
operationally protect these engines and

712  
00:26:27,510 --> 00:26:25,679  
to make it safer for them to start up

713  
00:26:29,669 --> 00:26:27,520

and to come up the full thrust

714

00:26:31,269 --> 00:26:29,679

and stay at full thrust

715

00:26:33,750 --> 00:26:31,279

so um

716

00:26:35,830 --> 00:26:33,760

all all in all this series of

717

00:26:38,149 --> 00:26:35,840

drone ship landings has been has been

718

00:26:40,230 --> 00:26:38,159

extremely successful even when we didn't

719

00:26:42,470 --> 00:26:40,240

recover all the um

720

00:26:44,070 --> 00:26:42,480

all the first stages

721

00:26:46,390 --> 00:26:44,080

actually we did recover them all you

722

00:26:47,430 --> 00:26:46,400

mean protecting the engines in flight is

723

00:26:49,269 --> 00:26:47,440

that what you're talking about

724

00:26:51,269 --> 00:26:49,279

protecting the engines through doing

725

00:26:53,350 --> 00:26:51,279

re-entry yeah that's when it gets hot

726

00:26:56,230 --> 00:26:53,360

and we we enter um

727

00:26:58,470 --> 00:26:56,240

with the engines facing the the flow

728

00:27:00,950 --> 00:26:58,480

so it's basically the engine

729

00:27:02,230 --> 00:27:00,960

directly exposed to the uh hard flow and

730

00:27:04,549 --> 00:27:02,240

that's when you need to protect the

731

00:27:06,630 --> 00:27:04,559

engines and uh the gases and liquids

732

00:27:08,230 --> 00:27:06,640

that are in the engine make sure that

733

00:27:10,070 --> 00:27:08,240

nothing boils off and

734

00:27:12,470 --> 00:27:10,080

does funny things

735

00:27:14,549 --> 00:27:12,480

next question behind

736

00:27:16,070 --> 00:27:14,559

lauren gresh with verge hans another

737

00:27:17,830 --> 00:27:16,080

question for you

738

00:27:20,149 --> 00:27:17,840

i know that if you land this one your

739

00:27:22,470 --> 00:27:20,159

hangar is going to be a little full at

740

00:27:25,830 --> 00:27:22,480

39a so i'm curious to know about your

741

00:27:29,190 --> 00:27:25,840

storage options moving forward

742

00:27:32,630 --> 00:27:30,310

i think we're looking at different

743

00:27:34,950 --> 00:27:32,640

places to store and we need to actually

744

00:27:37,110 --> 00:27:34,960

you got a good point we um we are

745

00:27:38,389 --> 00:27:37,120

working on getting the hanger clear and

746

00:27:41,430 --> 00:27:38,399

and

747

00:27:44,389 --> 00:27:41,440

we have to start working on on falcon

748

00:27:45,350 --> 00:27:44,399

heavy uh to to uh to get it integrated

749

00:27:46,470 --> 00:27:45,360

there so

750

00:27:48,230 --> 00:27:46,480

um

751

00:27:49,590 --> 00:27:48,240

i don't know exactly what what our

752

00:27:51,669 --> 00:27:49,600

options are i know that the team is

753

00:27:53,190 --> 00:27:51,679

working on that and i believe we are

754

00:27:55,430 --> 00:27:53,200

looking at different hangers in the in

755

00:27:57,110 --> 00:27:55,440

the vicinity here

756

00:28:02,549 --> 00:27:57,120

next question from the room right back

757

00:28:06,470 --> 00:28:04,310

hi jeff thousands of space news uh for

758

00:28:08,070 --> 00:28:06,480

cody was the timing of the risk asses

759

00:28:10,230 --> 00:28:08,080

assessment driven by the weather

760

00:28:11,909 --> 00:28:10,240

forecast because of the winds issue and

761

00:28:13,669 --> 00:28:11,919

has there been are you aware of previous

762

00:28:16,149 --> 00:28:13,679

cases of launches where you've had to

763

00:28:17,510 --> 00:28:16,159

evacuate ksc facilities like the press

764

00:28:19,909 --> 00:28:17,520

site in the vab

765

00:28:22,310 --> 00:28:19,919

because of an issue like this uh well so

766

00:28:23,909 --> 00:28:22,320

the second question first yes absolutely

767

00:28:27,350 --> 00:28:23,919

there have been several occasions in the

768

00:28:29,830 --> 00:28:27,360

past where we've had to move people

769

00:28:33,190 --> 00:28:29,840

for one reason or another be a

770

00:28:35,830 --> 00:28:33,200

distant focused over pressure or debris

771

00:28:37,350 --> 00:28:35,840

the to address your first question we

772

00:28:38,310 --> 00:28:37,360

are

773

00:28:40,230 --> 00:28:38,320

driven

774

00:28:42,149 --> 00:28:40,240

on by uncertainty

775

00:28:44,470 --> 00:28:42,159

and the further out we predict the more

776

00:28:46,310 --> 00:28:44,480

uncertainty there is in the model so as

777

00:28:49,110 --> 00:28:46,320

we get closer and closer to the launch

778

00:28:51,190 --> 00:28:49,120

time we'll get updated analyses run by

779

00:28:53,909 --> 00:28:51,200

the wing those analyses will then be

780

00:28:55,990 --> 00:28:53,919

passed to us in range safety here at ksc

781

00:28:59,269 --> 00:28:56,000

and then we'll evaluate those and make

782

00:29:03,110 --> 00:28:59,279

adjustments as necessary

783

00:29:07,909 --> 00:29:05,510

hi so given the loss of the docking

784

00:29:09,510 --> 00:29:07,919

adapter last year

785

00:29:11,990 --> 00:29:09,520

if there is any sort of catastrophic

786

00:29:13,590 --> 00:29:12,000

failure in ida 2 or three is there any

787

00:29:15,510 --> 00:29:13,600

sort of contingency plan given that it's

788

00:29:17,669 --> 00:29:15,520

likely the crew dragon and boeing

789

00:29:19,830 --> 00:29:17,679

starliner will overlap in their times at

790

00:29:21,830 --> 00:29:19,840

the station

791

00:29:24,230 --> 00:29:21,840

so i'll i'll answer that the uh well

792

00:29:26,149 --> 00:29:24,240

first of all we have 100 confidence in

793

00:29:28,389 --> 00:29:26,159

spacex we're going to get this guy up

794

00:29:31,590 --> 00:29:28,399

there and and attach the space station

795

00:29:33,750 --> 00:29:31,600

as planned uh we do have an ida 3

796

00:29:36,149 --> 00:29:33,760

that's uh that's in work as a result you

797

00:29:37,830 --> 00:29:36,159

know the the loss the first one we've

798

00:29:39,590 --> 00:29:37,840

had this in work we got planned that'll

799

00:29:42,389 --> 00:29:39,600

fly on a future spacex i believe we're

800

00:29:44,149 --> 00:29:42,399

targeting spacex 14 for that

801  
00:29:46,149 --> 00:29:44,159  
as far as you know documentaries and

802  
00:29:47,750 --> 00:29:46,159  
we'll just manage what we have there's

803  
00:29:49,350 --> 00:29:47,760  
not a constraint we're going to be ready

804  
00:29:50,950 --> 00:29:49,360  
when the commercial crew program's ready

805  
00:29:52,310 --> 00:29:50,960  
the dock and we'll just manage

806  
00:29:53,029 --> 00:29:52,320  
accordingly

807  
00:29:54,230 --> 00:29:53,039  
sure

808  
00:29:56,070 --> 00:29:54,240  
we'll stay with questions in the room

809  
00:29:57,990 --> 00:29:56,080  
but please remember to identify yourself

810  
00:30:01,070 --> 00:29:58,000  
and who your question is directed to in

811  
00:30:03,669 --> 00:30:02,389  
stuartmoneyinterspace.net and my

812  
00:30:05,430 --> 00:30:03,679  
question is for hans could you

813  
00:30:07,750 --> 00:30:05,440

characterize how difficult this

814

00:30:10,710 --> 00:30:07,760

particular land landing is compared to

815

00:30:12,630 --> 00:30:10,720

the orbcom2 landing and what's the

816

00:30:14,710 --> 00:30:12,640

availability propellant margin are you

817

00:30:16,789 --> 00:30:14,720

confident that the propellant is going

818

00:30:19,990 --> 00:30:16,799

to be there yeah it's good point um the

819

00:30:22,470 --> 00:30:20,000

opcom 2 landing or flight 21

820

00:30:24,870 --> 00:30:22,480

was very similar actually and um

821

00:30:26,870 --> 00:30:24,880

i believe it is on par

822

00:30:28,310 --> 00:30:26,880

um

823

00:30:46,870 --> 00:30:28,320

i

824

00:30:49,110 --> 00:30:46,880

um

825

00:30:51,110 --> 00:30:49,120

it's also at night so you want to see

826

00:30:58,789 --> 00:30:51,120

the same same thing that

827

00:31:01,590 --> 00:31:00,230

for our next question we'll go to social

828

00:31:04,230 --> 00:31:01,600

media

829

00:31:07,190 --> 00:31:04,240

and this is for hans john krause asks

830

00:31:08,950 --> 00:31:07,200

how long approximately will each

831

00:31:10,630 --> 00:31:08,960

entry burn

832

00:31:13,029 --> 00:31:10,640

for each stage

833

00:31:15,029 --> 00:31:13,039

i think the entry burns are about 15 to

834

00:31:16,389 --> 00:31:15,039

20 seconds

835

00:31:18,230 --> 00:31:16,399

okay

836

00:31:19,990 --> 00:31:18,240

why each stage and it's only one stage

837

00:31:21,990 --> 00:31:20,000

that comes back i'm just reading the

838

00:31:25,029 --> 00:31:22,000

question

839

00:31:27,590 --> 00:31:25,039

and secondly escape velocity asks which

840

00:31:29,269 --> 00:31:27,600

experiments going up on spacex crs9

841

00:31:32,630 --> 00:31:29,279

might help contribute to the

842

00:31:34,470 --> 00:31:32,640

commercialization of low earth orbit

843

00:31:35,990 --> 00:31:34,480

sure that's a great question

844

00:31:37,110 --> 00:31:36,000

there are a number of the experiments

845

00:31:39,110 --> 00:31:37,120

that are quite applicable to

846

00:31:41,830 --> 00:31:39,120

commercialization of low earth orbit

847

00:31:44,310 --> 00:31:41,840

certainly uh the global automatic

848

00:31:45,990 --> 00:31:44,320

identification system the global ais

849

00:31:48,070 --> 00:31:46,000

which is an application for commercial

850

00:31:50,149 --> 00:31:48,080

maritime traffic that's a space-based

851

00:31:52,230 --> 00:31:50,159

capability that's important

852

00:31:55,430 --> 00:31:52,240

uh over the long term this is a one-year

853

00:31:57,990 --> 00:31:55,440

test to demonstrate that capability uh

854

00:32:00,230 --> 00:31:58,000

the work that eli lilly is doing the

855

00:32:02,470 --> 00:32:00,240

work on the metal alloys all of those

856

00:32:04,710 --> 00:32:02,480

different kinds of research linked to

857

00:32:08,870 --> 00:32:04,720

different industrial applications back

858

00:32:13,029 --> 00:32:10,149

thank you i think we'll take a question

859

00:32:18,149 --> 00:32:15,430

mark gotch please

860

00:32:19,909 --> 00:32:18,159

mark gotch historical aerospace news

861

00:32:20,870 --> 00:32:19,919

good afternoon a very informative

862

00:32:23,110 --> 00:32:20,880

briefing

863

00:32:25,190 --> 00:32:23,120

uh i wanted to direct this to julie

864

00:32:27,430 --> 00:32:25,200

first off to say julie the science

865

00:32:30,549 --> 00:32:27,440

payload going on board is going to be

866

00:32:32,870 --> 00:32:30,559

just incredible again once again going

867

00:32:34,389 --> 00:32:32,880

to the greatest laboratory ever created

868

00:32:37,350 --> 00:32:34,399

by mankind

869

00:32:40,070 --> 00:32:37,360

and hans can you tell me involving

870

00:32:42,310 --> 00:32:40,080

the actual merlin engines is there any

871

00:32:45,190 --> 00:32:42,320

change to those mermaid engines on this

872

00:32:47,190 --> 00:32:45,200

mission and once again the 45th space

873

00:32:49,509 --> 00:32:47,200

swing overseeing this mission as they

874

00:32:53,350 --> 00:32:49,519

did previously when spacex landed on

875

00:32:55,509 --> 00:32:53,360

land last december in 2015

876

00:32:57,830 --> 00:32:55,519

they are airing on the side of safety

877

00:32:59,669 --> 00:32:57,840

and making sure that everything will be

878

00:33:01,110 --> 00:32:59,679

safe and i commend them and a good thing

879

00:33:03,350 --> 00:33:01,120

they're there

880

00:33:06,789 --> 00:33:03,360

the truth is can you tell me also hans

881

00:33:09,029 --> 00:33:06,799

the doc adopter ring what would be its

882

00:33:18,630 --> 00:33:09,039

exact weight as a payload on this

883

00:33:22,470 --> 00:33:20,149

well

884

00:33:23,430 --> 00:33:22,480

i certainly agree on the science

885

00:33:25,750 --> 00:33:23,440

and

886

00:33:30,630 --> 00:33:25,760

i think there was a question on the ida

887

00:33:32,789 --> 00:33:30,640

how much that weighed 500 kilograms yeah

888

00:33:36,230 --> 00:33:32,799

i got i got the question on the m1d

889

00:33:37,509 --> 00:33:36,240

there's no change on that so

890

00:33:39,830 --> 00:33:37,519

all right we'll take our next question

891

00:33:40,710 --> 00:33:39,840

from the roof i think we got them all

892

00:33:42,950 --> 00:33:40,720

matt

893

00:33:45,269 --> 00:33:42,960

upfront please

894

00:33:46,549 --> 00:33:45,279

hi thaddie cesari with the utica phoenix

895

00:33:47,990 --> 00:33:46,559

um

896

00:33:49,990 --> 00:33:48,000

i was hoping to hear a little bit about

897

00:33:52,149 --> 00:33:50,000

the ida 2 and why it's critical to the

898

00:33:54,149 --> 00:33:52,159

commercial crew program and then on top

899

00:33:56,230 --> 00:33:54,159

of that

900

00:33:58,310 --> 00:33:56,240

what kind of impact will the commercial

901  
00:34:01,029 --> 00:33:58,320  
commercial crew program have on the

902  
00:34:02,789 --> 00:34:01,039  
united states aerospace program

903  
00:34:04,389 --> 00:34:02,799  
so a couple things the commercial crew

904  
00:34:07,269 --> 00:34:04,399  
program they're going to be docking

905  
00:34:08,710 --> 00:34:07,279  
missions and right now the ports that we

906  
00:34:10,149 --> 00:34:08,720  
have onboard the international space

907  
00:34:12,069 --> 00:34:10,159  
station are birthing missions so the

908  
00:34:14,470 --> 00:34:12,079  
spacex and orbital missions are birthing

909  
00:34:17,030 --> 00:34:14,480  
the iss so these docking ports will

910  
00:34:19,510 --> 00:34:17,040  
enable the commercial crew and enable

911  
00:34:21,909 --> 00:34:19,520  
those missions and and those uh those

912  
00:34:22,950 --> 00:34:21,919  
teams the spacex team and and the boeing

913  
00:34:23,990 --> 00:34:22,960

team

914

00:34:25,909 --> 00:34:24,000

um

915

00:34:27,589 --> 00:34:25,919

and i'm sorry your second question what

916

00:34:29,430 --> 00:34:27,599

kind of impact will

917

00:34:31,190 --> 00:34:29,440

uh the international

918

00:34:33,829 --> 00:34:31,200

commercial crew well you know we're

919

00:34:35,430 --> 00:34:33,839

moving from you know right now as most

920

00:34:37,190 --> 00:34:35,440

you are well aware we're launching the

921

00:34:39,750 --> 00:34:37,200

astronauts from the soyuz vehicles

922

00:34:41,510 --> 00:34:39,760

outside of um from baikonur kazakhstan

923

00:34:42,629 --> 00:34:41,520

with this move to the commercial crew

924

00:34:45,190 --> 00:34:42,639

we're gonna do a couple of things we're

925

00:34:46,470 --> 00:34:45,200

gonna increase the number of usos crew

926  
00:34:48,389 --> 00:34:46,480  
members the four

927  
00:34:50,389 --> 00:34:48,399  
and that fourth crew member all his

928  
00:34:53,030 --> 00:34:50,399  
times can be dedicated to research and

929  
00:34:55,270 --> 00:34:53,040  
utilization on board so right now we

930  
00:34:57,349 --> 00:34:55,280  
tell the teams we average about 35 hours

931  
00:34:59,190 --> 00:34:57,359  
of crew tended utilization and research

932  
00:35:00,710 --> 00:34:59,200  
that's above and beyond all the

933  
00:35:02,470 --> 00:35:00,720  
autonomous research that's going on

934  
00:35:04,710 --> 00:35:02,480  
we're going to double that from 35 to

935  
00:35:06,790 --> 00:35:04,720  
almost 70 crew hours once we get the

936  
00:35:09,109 --> 00:35:06,800  
commercial crew program so that's going

937  
00:35:10,630 --> 00:35:09,119  
to enable us uh you know enabling the

938  
00:35:13,030 --> 00:35:10,640

partners and and bringing that

939

00:35:15,829 --> 00:35:13,040

capability back to the united states is

940

00:35:17,750 --> 00:35:15,839

is a huge benefit and and that'll be

941

00:35:19,829 --> 00:35:17,760

that'll be seen throughout the aerospace

942

00:35:21,190 --> 00:35:19,839

industry

943

00:35:23,190 --> 00:35:21,200

can we expect to see some of the

944

00:35:25,430 --> 00:35:23,200

customers that would usually take a ride

945

00:35:27,589 --> 00:35:25,440

on the soyuz migrating to the u.s

946

00:35:29,829 --> 00:35:27,599

commercial crew program

947

00:35:32,950 --> 00:35:29,839

so right now we're we're planning the

948

00:35:35,510 --> 00:35:32,960

five professional astronauts on board

949

00:35:37,829 --> 00:35:35,520

and will that be u.s based specifically

950

00:35:39,910 --> 00:35:37,839

or internationally international it'll

951

00:35:41,670 --> 00:35:39,920

be international so uh will be part of

952

00:35:43,430 --> 00:35:41,680

our partnership with the canadian space

953

00:35:46,150 --> 00:35:43,440

agency the european space agency and the

954

00:35:47,829 --> 00:35:46,160

japanese space agency

955

00:35:52,470 --> 00:35:47,839

and we'll have sorry we have time for

956

00:35:56,230 --> 00:35:53,670

all right josh jenner with the orbital

957

00:35:58,710 --> 00:35:56,240

dot spaces questions for hans

958

00:36:00,790 --> 00:35:58,720

has a booster been chosen specifically

959

00:36:04,470 --> 00:36:00,800

for the first reflight test

960

00:36:06,630 --> 00:36:04,480

um or has that decision been made yet

961

00:36:08,470 --> 00:36:06,640

uh the answer yes

962

00:36:09,349 --> 00:36:08,480

which one

963

00:36:10,310 --> 00:36:09,359

okay

964

00:36:14,870 --> 00:36:10,320

um

965

00:36:16,630 --> 00:36:14,880

it's the crs-8 booster

966

00:36:17,829 --> 00:36:16,640

the uh last year's flight i think i

967

00:36:23,190 --> 00:36:17,839

landed on this and that was the first

968

00:36:28,950 --> 00:36:24,550

thank you

969

00:36:30,470 --> 00:36:28,960

briefing today our next pre-launch

970

00:36:31,750 --> 00:36:30,480

briefing will take a deep dive into the

971

00:36:33,030 --> 00:36:31,760

science headed to the international

972

00:36:34,790 --> 00:36:33,040

space station

973

00:36:37,190 --> 00:36:34,800

so please tune in to nasa television to

974

00:36:40,230 --> 00:36:37,200

hear more from julie and others at 3 p.m

975

00:36:41,990 --> 00:36:40,240

eastern on sunday july 17th as a

976

00:36:45,430 --> 00:36:42,000

reminder we are targeting launch of

977

00:36:47,750 --> 00:36:45,440

spacex crs-9 no earlier than 12 45 a.m

978

00:36:49,510 --> 00:36:47,760

on monday july 18th

979

00:36:53,030 --> 00:36:49,520

nasa television coverage of launch will