
ARTEMIS

1
00:00:22,520 --> 00:00:12,560
[Music]

2
00:00:41,330 --> 00:00:22,530
do

3
00:01:34,789 --> 00:01:06,140
[Music]

4
00:02:02,150 --> 00:01:36,270
so

5
00:02:02,160 --> 00:02:16,630
[Music]

6
00:02:20,630 --> 00:02:18,630
good morning everyone and thank you for

7
00:02:22,869 --> 00:02:20,640
joining us here in houston texas at the

8
00:02:25,830 --> 00:02:22,879
nasa johnson space center i am gary

9
00:02:27,510 --> 00:02:25,840
jordan uh thanks for joining us here for

10
00:02:29,190 --> 00:02:27,520
our media day here at the johnson space

11
00:02:30,790 --> 00:02:29,200
center i hope everybody's been having a

12
00:02:32,710 --> 00:02:30,800
good time it's really good to see a

13
00:02:33,990 --> 00:02:32,720

crowd of this size out of the johnson

14
00:02:36,150 --> 00:02:34,000
space center

15
00:02:38,309 --> 00:02:36,160
you'll notice that most of the day today

16
00:02:40,390 --> 00:02:38,319
has been uh and most of your experience

17
00:02:42,150 --> 00:02:40,400
has been looking at artemis as a whole

18
00:02:45,670 --> 00:02:42,160
and the future that the artemis one

19
00:02:47,270 --> 00:02:45,680
mission will be uh bringing us very soon

20
00:02:49,190 --> 00:02:47,280
at this point in our media day we're

21
00:02:51,430 --> 00:02:49,200
gonna bring together a panel of experts

22
00:02:53,430 --> 00:02:51,440
to discuss the artemis one mission in

23
00:02:55,830 --> 00:02:53,440
more detail we'll discuss the mission

24
00:02:58,149 --> 00:02:55,840
operations the recovery operations the

25
00:03:00,309 --> 00:02:58,159
orion capsule uh the european service

26
00:03:01,990 --> 00:03:00,319
module and astronaut training

27
00:03:04,949 --> 00:03:02,000
that's preparing for artemis ii and

28
00:03:06,630 --> 00:03:04,959
beyond so joining us to provide remarks

29
00:03:09,110 --> 00:03:06,640
and answer questions we have here at the

30
00:03:11,350 --> 00:03:09,120
johnson space center uh rick lebrode

31
00:03:13,589 --> 00:03:11,360
lead artemis one flight director judge

32
00:03:14,869 --> 00:03:13,599
freeling artemis one ascent and entry

33
00:03:18,070 --> 00:03:14,879
flight director

34
00:03:20,790 --> 00:03:18,080
debbie korf orion program deputy manager

35
00:03:22,869 --> 00:03:20,800
and reid wiseman chief astronaut

36
00:03:24,869 --> 00:03:22,879
joining us remotely from nasa's kennedy

37
00:03:27,910 --> 00:03:24,879
space center in florida we have melissa

38
00:03:29,509 --> 00:03:27,920

jones artemis one recovery director and

39
00:03:31,430 --> 00:03:29,519
joining us from the european space

40
00:03:33,750 --> 00:03:31,440
agency in the netherlands philippe de

41
00:03:35,830 --> 00:03:33,760
lou orion european service module

42
00:03:37,910 --> 00:03:35,840
program manager thank you all for being

43
00:03:40,149 --> 00:03:37,920
here we'll first start with a short

44
00:03:41,990 --> 00:03:40,159
presentation from each of our briefers

45
00:03:43,910 --> 00:03:42,000
before opening and opening it up for

46
00:03:45,830 --> 00:03:43,920
questions we'll be taking questions on

47
00:03:47,430 --> 00:03:45,840
our phone bridge as well as here in the

48
00:03:49,589 --> 00:03:47,440
room for those here in the room please

49
00:03:51,910 --> 00:03:49,599
raise your hand nice and high so we can

50
00:03:53,429 --> 00:03:51,920
see you and run a microphone over to you

51
00:03:55,190 --> 00:03:53,439
and then ask your question once you

52
00:03:57,190 --> 00:03:55,200
actually have the microphone

53
00:03:59,750 --> 00:03:57,200
for those on the phone please press star

54
00:04:02,229 --> 00:03:59,760
1 to enter into our queue so we can get

55
00:04:03,910 --> 00:04:02,239
to you and you can ask your question now

56
00:04:05,350 --> 00:04:03,920
we'll start with our experts here at the

57
00:04:08,470 --> 00:04:05,360
johnson space center i'll first hand it

58
00:04:10,869 --> 00:04:08,480
over to rick and judd go ahead gentlemen

59
00:04:13,030 --> 00:04:10,879
all right thank you gary and as gary

60
00:04:14,390 --> 00:04:13,040
said my name is rick lebron i'm the lead

61
00:04:15,270 --> 00:04:14,400
flight director for the artemis 1

62
00:04:17,349 --> 00:04:15,280
mission

63
00:04:18,949 --> 00:04:17,359

and before judd and i start with our

64
00:04:21,030 --> 00:04:18,959
mission overview i just want to take a

65
00:04:22,310 --> 00:04:21,040
moment and thank you all for coming out

66
00:04:24,390 --> 00:04:22,320
today

67
00:04:26,629 --> 00:04:24,400
our teams have been working extremely

68
00:04:28,629 --> 00:04:26,639
hard for a very very long time to get to

69
00:04:30,950 --> 00:04:28,639
this point and this is this is very

70
00:04:33,590 --> 00:04:30,960
special we're extremely excited and we

71
00:04:35,350 --> 00:04:33,600
want to make sure that the the public uh

72
00:04:38,230 --> 00:04:35,360
feels our excitement and hears our story

73
00:04:39,909 --> 00:04:38,240
and we realize that we rely completely

74
00:04:42,390 --> 00:04:39,919
on you all to do that so thank you so

75
00:04:44,310 --> 00:04:42,400
much for uh for coming out today and and

76
00:04:46,310 --> 00:04:44,320
showing interest in our in our mission

77
00:04:47,990 --> 00:04:46,320
so uh we'll go ahead and pick up with

78
00:04:49,270 --> 00:04:48,000
the uh with an overview of the mission

79
00:04:50,469 --> 00:04:49,280
i'm going to hand over to judd to start

80
00:04:52,230 --> 00:04:50,479
the first part

81
00:04:54,150 --> 00:04:52,240
all right good morning everybody that's

82
00:04:56,870 --> 00:04:54,160
the artist one uh our first planned

83
00:05:00,629 --> 00:04:56,880
launch attempt will be august 29th

84
00:05:02,469 --> 00:05:00,639
with plan splashdown of october the 10th

85
00:05:04,310 --> 00:05:02,479
charlie blackwell thompson and her team

86
00:05:06,150 --> 00:05:04,320
at the launch control center in at

87
00:05:07,590 --> 00:05:06,160
kennedy space center will hand over the

88
00:05:11,029 --> 00:05:07,600

vehicle once they launch that vehicle

89
00:05:13,510 --> 00:05:11,039
unleash the 8.8 million pounds of thrust

90
00:05:15,350 --> 00:05:13,520
uh we'll start our journey uh we could

91
00:05:16,790 --> 00:05:15,360
have the graphic there

92
00:05:19,350 --> 00:05:16,800
once uh

93
00:05:21,430 --> 00:05:19,360
once we start the liftoff uh and the the

94
00:05:23,590 --> 00:05:21,440
vehicle clears the tower uh we'll start

95
00:05:25,510 --> 00:05:23,600
a roll program uh that will bring the

96
00:05:27,830 --> 00:05:25,520
orion capsule to a heads-down position

97
00:05:30,550 --> 00:05:27,840
much like we did in shuttle

98
00:05:32,310 --> 00:05:30,560
uh we'll uh about a minute into the to

99
00:05:34,390 --> 00:05:32,320
the flight uh we'll experience our

100
00:05:36,469 --> 00:05:34,400
maximum dynamic pressure and so the the

101
00:05:37,670 --> 00:05:36,479
four core stage engines will throttle

102
00:05:39,350 --> 00:05:37,680
down for that

103
00:05:41,189 --> 00:05:39,360
that period

104
00:05:42,070 --> 00:05:41,199
throw back up

105
00:05:43,909 --> 00:05:42,080
and then

106
00:05:44,950 --> 00:05:43,919
about two minutes into the flight

107
00:05:47,590 --> 00:05:44,960
the

108
00:05:49,909 --> 00:05:47,600
solid rocket booster motor engines will

109
00:05:52,710 --> 00:05:49,919
expend their fuel and they will

110
00:05:54,790 --> 00:05:52,720
detach from the core stage splashdown in

111
00:05:56,950 --> 00:05:54,800
the pacific

112
00:05:59,830 --> 00:05:56,960
correction in the atlantic

113
00:06:01,909 --> 00:05:59,840

we continue on uh to another about three

114
00:06:04,469 --> 00:06:01,919
and a half minutes or so the service

115
00:06:05,430 --> 00:06:04,479
module uh panels will jettison along

116
00:06:06,950 --> 00:06:05,440
with the

117
00:06:09,110 --> 00:06:06,960
launch abort system and those will

118
00:06:11,350 --> 00:06:09,120
expose the solar rays on the service

119
00:06:14,469 --> 00:06:11,360
module and the capsule

120
00:06:17,990 --> 00:06:14,479
of orion the the command module

121
00:06:21,430 --> 00:06:18,000
continuing on further uh throughout

122
00:06:23,510 --> 00:06:21,440
the the flight uh until uh

123
00:06:25,590 --> 00:06:23,520
about eight and a half minutes uh where

124
00:06:28,230 --> 00:06:25,600
we will have main engine cutoff

125
00:06:30,390 --> 00:06:28,240
and um after main engine cutoff we'll

126
00:06:33,430 --> 00:06:30,400
separate the core stage from the

127
00:06:35,189 --> 00:06:33,440
combined orion and upper stage or

128
00:06:36,629 --> 00:06:35,199
interim control

129
00:06:41,510 --> 00:06:36,639
upper stage

130
00:06:44,870 --> 00:06:41,520
that will continue on

131
00:06:46,230 --> 00:06:44,880
then to about 18 minutes met mission

132
00:06:48,469 --> 00:06:46,240
elapsed time

133
00:06:50,469 --> 00:06:48,479
we'll deploy the orion solar arrays to

134
00:06:52,309 --> 00:06:50,479
provide power to the batteries

135
00:06:55,990 --> 00:06:52,319
uh that'll take about 12 minutes to

136
00:06:57,430 --> 00:06:56,000
deploy uh we'll continue on to our first

137
00:06:59,029 --> 00:06:57,440
burn that is going to be performed by

138
00:07:01,189 --> 00:06:59,039

the upper stage that's called the

139
00:07:03,670 --> 00:07:01,199
perigee rays maneuver

140
00:07:06,710 --> 00:07:03,680
the core stage puts us in a an orbit

141
00:07:08,230 --> 00:07:06,720
that's a 16 nautical miles by 975

142
00:07:11,110 --> 00:07:08,240
nautical mile orbit

143
00:07:13,990 --> 00:07:11,120
uh so if if we did nothing at that point

144
00:07:15,830 --> 00:07:14,000
uh to to correct the the perigee side or

145
00:07:17,830 --> 00:07:15,840
the the small side that 16 nautical mile

146
00:07:19,670 --> 00:07:17,840
more orbit uh the whole capsule would

147
00:07:23,189 --> 00:07:19,680
come back to the earth just like the

148
00:07:25,270 --> 00:07:23,199
core stage is going to do in the pacific

149
00:07:27,510 --> 00:07:25,280
uh we'll perform that perigee rays

150
00:07:29,189 --> 00:07:27,520
maneuver to 100 nautical miles at

151
00:07:30,469 --> 00:07:29,199
approximately 51 minutes into the

152
00:07:33,029 --> 00:07:30,479
mission

153
00:07:35,350 --> 00:07:33,039
uh the whole time the the upper stage

154
00:07:37,189 --> 00:07:35,360
will be in control of the stack

155
00:07:38,550 --> 00:07:37,199
in the interim it will be doing several

156
00:07:40,070 --> 00:07:38,560
maneuvers

157
00:07:42,070 --> 00:07:40,080
to get to a

158
00:07:44,309 --> 00:07:42,080
solar friendly attitude for the orion

159
00:07:47,430 --> 00:07:44,319
spacecraft and also do some roll

160
00:07:49,749 --> 00:07:47,440
maneuvers uh to uh to make sure that the

161
00:07:52,150 --> 00:07:49,759
uh thermal the the the whole vehicle is

162
00:07:54,390 --> 00:07:52,160
thermally conditioned

163
00:07:57,749 --> 00:07:54,400

uh pressing on forward uh

164
00:08:00,070 --> 00:07:57,759
once we have attained a safe orbit with

165
00:08:01,909 --> 00:08:00,080
perigee rays maneuver will continue on

166
00:08:03,909 --> 00:08:01,919
and our our final maneuver by the upper

167
00:08:06,550 --> 00:08:03,919
stage will be the translunar injection

168
00:08:09,270 --> 00:08:06,560
orbit maneuver by the upper stage that

169
00:08:12,150 --> 00:08:09,280
will be approximately an hour and

170
00:08:14,869 --> 00:08:12,160
20 30 minutes into the flight that'll be

171
00:08:16,869 --> 00:08:14,879
about an 18 minute burn

172
00:08:19,749 --> 00:08:16,879
and will send us all the way to the moon

173
00:08:22,150 --> 00:08:19,759
approximately quarter million miles away

174
00:08:24,790 --> 00:08:22,160
and once once we completed the the

175
00:08:27,110 --> 00:08:24,800
translucent injection maneuver

176
00:08:29,430 --> 00:08:27,120
and separate the upper stage from the

177
00:08:31,510 --> 00:08:29,440
orion spacecraft uh then my team will

178
00:08:33,589 --> 00:08:31,520
hand over to rick and uh he'll he'll

179
00:08:35,269 --> 00:08:33,599
start the majority of the mission there

180
00:08:37,190 --> 00:08:35,279
so rick we're gonna talk about that all

181
00:08:39,110 --> 00:08:37,200
right if we can go to the next chart

182
00:08:40,870 --> 00:08:39,120
please

183
00:08:42,709 --> 00:08:40,880
so there's really no time to catch our

184
00:08:45,910 --> 00:08:42,719
breath we really hit the ground running

185
00:08:47,990 --> 00:08:45,920
um you'll see on this first chart um uh

186
00:08:50,389 --> 00:08:48,000
after we separate from the upper stage

187
00:08:52,389 --> 00:08:50,399
uh it actually does a disposal burn

188
00:08:54,630 --> 00:08:52,399

which sends it on a trajectory to the to

189
00:08:55,590 --> 00:08:54,640
the moon a heliocentric which is it'll

190
00:08:56,870 --> 00:08:55,600
swing around the moon and then head

191
00:08:57,910 --> 00:08:56,880
towards the sun

192
00:08:59,910 --> 00:08:57,920
um

193
00:09:03,430 --> 00:08:59,920
and on its way to the moon it actually

194
00:09:05,910 --> 00:09:03,440
uh will be deploying a handful of tin uh

195
00:09:08,230 --> 00:09:05,920
cubesats their secondary payloads we

196
00:09:09,269 --> 00:09:08,240
have no interaction with those secondary

197
00:09:10,630 --> 00:09:09,279
payloads

198
00:09:12,310 --> 00:09:10,640
the only thing we're concerned with is

199
00:09:15,030 --> 00:09:12,320
their initial trajectories um where

200
00:09:18,710 --> 00:09:15,040
they're being deployed so we can do a an

201
00:09:20,389 --> 00:09:18,720
assessment on a potential re-contact

202
00:09:22,389 --> 00:09:20,399
everything should go nominal there's no

203
00:09:24,550 --> 00:09:22,399
concern but we we need to make sure that

204
00:09:27,110 --> 00:09:24,560
the trajectory is what we expect

205
00:09:28,710 --> 00:09:27,120
so um with that uh

206
00:09:30,230 --> 00:09:28,720
i want to i want to

207
00:09:31,670 --> 00:09:30,240
i want to get away from this chart let's

208
00:09:34,070 --> 00:09:31,680
go to the next chart

209
00:09:35,430 --> 00:09:34,080
we'll take off the icps piece of it so

210
00:09:37,030 --> 00:09:35,440
uh

211
00:09:38,790 --> 00:09:37,040
it's i'm going to talk through a lot of

212
00:09:40,310 --> 00:09:38,800
this you know it's 42 days and i'm going

213
00:09:43,269 --> 00:09:40,320

to try and do it in just a handful of

214
00:09:45,030 --> 00:09:43,279
minutes so um by all means there'll be

215
00:09:48,389 --> 00:09:45,040
plenty of time to ask questions after

216
00:09:50,150 --> 00:09:48,399
after we're all finished here um so

217
00:09:51,750 --> 00:09:50,160
i said we hit that first day we hit the

218
00:09:54,150 --> 00:09:51,760
ground running one of the first things

219
00:09:55,990 --> 00:09:54,160
we're going to do is a we have to do a

220
00:09:57,910 --> 00:09:56,000
test of our guidance and navigation

221
00:09:59,430 --> 00:09:57,920
control system there's a set of gains

222
00:10:01,670 --> 00:09:59,440
that are used

223
00:10:03,750 --> 00:10:01,680
and and the way they fire the thrusters

224
00:10:05,190 --> 00:10:03,760
in our normal

225
00:10:06,870 --> 00:10:05,200
attitude control

226
00:10:08,630 --> 00:10:06,880
and we need to make sure those gains are

227
00:10:10,310 --> 00:10:08,640
set such that we don't damage our solar

228
00:10:11,509 --> 00:10:10,320
arrays so we're going to be doing that

229
00:10:13,670 --> 00:10:11,519
right after that's one of the first

230
00:10:14,949 --> 00:10:13,680
things we do once we once we separate

231
00:10:16,790 --> 00:10:14,959
and then we're also on that first day

232
00:10:19,509 --> 00:10:16,800
going to do

233
00:10:21,829 --> 00:10:19,519
the first of a a handful of um outboard

234
00:10:23,190 --> 00:10:21,839
trajectory correction burns and this

235
00:10:24,949 --> 00:10:23,200
very first one we're going to actually

236
00:10:26,389 --> 00:10:24,959
be checking out the um

237
00:10:28,470 --> 00:10:26,399
orbital

238
00:10:30,710 --> 00:10:28,480

maneuvering system it's the big engine

239
00:10:33,350 --> 00:10:30,720
that we'll be using um we want to check

240
00:10:34,870 --> 00:10:33,360
that out uh because that's the big bird

241
00:10:36,949 --> 00:10:34,880
that's the engine we're going to use

242
00:10:39,110 --> 00:10:36,959
when we do the big burn on the out

243
00:10:40,870 --> 00:10:39,120
outbound powered flyby as we go by the

244
00:10:41,910 --> 00:10:40,880
moon and i'll talk about that a little

245
00:10:44,470 --> 00:10:41,920
bit uh

246
00:10:46,389 --> 00:10:44,480
shortly but uh that first that first

247
00:10:48,710 --> 00:10:46,399
burn like i said it's a checkout it also

248
00:10:50,310 --> 00:10:48,720
will get us moving ahead of the upper

249
00:10:52,069 --> 00:10:50,320
stage and those satellites so we should

250
00:10:53,990 --> 00:10:52,079
get to the moon somewhere on the order

251
00:10:56,230 --> 00:10:54,000
of two and a half hours before before

252
00:10:57,590 --> 00:10:56,240
the satellites and the upper stage do so

253
00:11:01,190 --> 00:10:57,600
there's no that's why there's no really

254
00:11:03,910 --> 00:11:01,200
concern of re-contact so on our way to

255
00:11:05,670 --> 00:11:03,920
the moon um like i said we'll be doing a

256
00:11:07,750 --> 00:11:05,680
series of these outbound trajectory

257
00:11:09,350 --> 00:11:07,760
corrections they're very small uh or at

258
00:11:10,790 --> 00:11:09,360
least they're designed to be small if we

259
00:11:12,470 --> 00:11:10,800
end up having dispersions because of

260
00:11:15,030 --> 00:11:12,480
burn didn't go as planned then we'll

261
00:11:16,949 --> 00:11:15,040
make it up in a subsequent burn uh well

262
00:11:19,269 --> 00:11:16,959
i think we have uh we have four of those

263
00:11:20,949 --> 00:11:19,279

on the way to the moon and those all set

264
00:11:22,470 --> 00:11:20,959
us up for what i said is the outbound

265
00:11:24,550 --> 00:11:22,480
powered flyby

266
00:11:26,310 --> 00:11:24,560
that's the big burn that we'll we'll

267
00:11:28,069 --> 00:11:26,320
we'll uh we'll

268
00:11:31,110 --> 00:11:28,079
actually move orion then it'll send it

269
00:11:33,269 --> 00:11:31,120
up to uh the distant retrograde orbit so

270
00:11:35,190 --> 00:11:33,279
when we do that burn and we go by the by

271
00:11:37,110 --> 00:11:35,200
the moon we're going to be about 60

272
00:11:39,350 --> 00:11:37,120
miles off the surface of the of the of

273
00:11:40,710 --> 00:11:39,360
the moon it's going to be spectacular

274
00:11:44,069 --> 00:11:40,720
um

275
00:11:45,910 --> 00:11:44,079
and

276
00:11:48,150 --> 00:11:45,920
to that note uh when we actually that

277
00:11:49,590 --> 00:11:48,160
burn actually executes it uh orion will

278
00:11:51,590 --> 00:11:49,600
be on the other side of the moon and we

279
00:11:53,430 --> 00:11:51,600
won't have we won't have time with it so

280
00:11:56,629 --> 00:11:53,440
we'll be praying and holding our breath

281
00:11:58,389 --> 00:11:56,639
um but confident that all will go well

282
00:12:01,190 --> 00:11:58,399
so after that burn like i said it sends

283
00:12:02,230 --> 00:12:01,200
us up to the uh distant retrograde orbit

284
00:12:04,550 --> 00:12:02,240
um

285
00:12:07,030 --> 00:12:04,560
a couple days uh after that burn we will

286
00:12:10,069 --> 00:12:07,040
do what we call an insertion burn it's a

287
00:12:12,150 --> 00:12:10,079
dis retrograde uh orbit insertion uh

288
00:12:14,389 --> 00:12:12,160

we'll also use that big big engine the

289
00:12:16,470 --> 00:12:14,399
ohms engine to enter the district

290
00:12:18,310 --> 00:12:16,480
retrograde orbit and then once we're in

291
00:12:19,910 --> 00:12:18,320
the district retrograde orbit we're

292
00:12:21,430 --> 00:12:19,920
going to spend um

293
00:12:22,629 --> 00:12:21,440
we're going to spend a little over two

294
00:12:23,590 --> 00:12:22,639
weeks there

295
00:12:25,509 --> 00:12:23,600
you've heard

296
00:12:27,590 --> 00:12:25,519
us talk about long class missions and

297
00:12:29,350 --> 00:12:27,600
short class missions the only difference

298
00:12:31,269 --> 00:12:29,360
in those two types of missions are the

299
00:12:33,750 --> 00:12:31,279
length of stay in the distant retrograde

300
00:12:35,670 --> 00:12:33,760
orbit for a short class mission we just

301
00:12:37,190 --> 00:12:35,680
do a half a lap and then we head back

302
00:12:39,030 --> 00:12:37,200
towards the men

303
00:12:40,790 --> 00:12:39,040
for the long class we do a full lap and

304
00:12:41,750 --> 00:12:40,800
a half and it's a little over over two

305
00:12:43,670 --> 00:12:41,760
weeks

306
00:12:45,509 --> 00:12:43,680
uh while we're in the distant retrograde

307
00:12:46,870 --> 00:12:45,519
orbit we'll be um

308
00:12:48,790 --> 00:12:46,880
we'll be doing what we call orbit

309
00:12:51,190 --> 00:12:48,800
maintenance burns they're small burns

310
00:12:52,870 --> 00:12:51,200
just to keep our orbit

311
00:12:54,470 --> 00:12:52,880
in sync

312
00:12:56,230 --> 00:12:54,480
we'll do that over the course of the

313
00:12:58,470 --> 00:12:56,240

next two weeks and then we'll do what we

314
00:13:00,629 --> 00:12:58,480
call a distant retrograde departure burn

315
00:13:02,629 --> 00:13:00,639
it's another large burn uh that uses the

316
00:13:04,389 --> 00:13:02,639
ohms engine and that'll send us back to

317
00:13:05,190 --> 00:13:04,399
the back to the moon

318
00:13:06,710 --> 00:13:05,200
and

319
00:13:07,430 --> 00:13:06,720
on our way back now we're doing what we

320
00:13:11,269 --> 00:13:07,440
call

321
00:13:12,629 --> 00:13:11,279
uh return uh trajectory corrections rtcs

322
00:13:16,069 --> 00:13:12,639
and we'll do a series of those all the

323
00:13:17,750 --> 00:13:16,079
way back to the back to earth um

324
00:13:20,629 --> 00:13:17,760
so we have a couple of those then that

325
00:13:22,550 --> 00:13:20,639
sets us up for um the return power flyby

326
00:13:24,550 --> 00:13:22,560
that is our most critical burn of the

327
00:13:25,829 --> 00:13:24,560
mission if if something happens with

328
00:13:27,829 --> 00:13:25,839
that one and we don't execute it then

329
00:13:29,350 --> 00:13:27,839
it's a loss of of the ryan capsule we

330
00:13:30,550 --> 00:13:29,360
have to do that one

331
00:13:33,030 --> 00:13:30,560
um

332
00:13:34,870 --> 00:13:33,040
but we we plan accordingly we have down

333
00:13:37,030 --> 00:13:34,880
mode capabilities and we can talk about

334
00:13:39,910 --> 00:13:37,040
that if you have questions but uh so we

335
00:13:42,069 --> 00:13:39,920
do the the rpf which actually sets up

336
00:13:44,150 --> 00:13:42,079
the entry interface that's the the area

337
00:13:46,550 --> 00:13:44,160
where when we enter the atmosphere uh

338
00:13:49,670 --> 00:13:46,560

several days later and sets up our our

339
00:13:52,150 --> 00:13:49,680
splashdown off the coast of california

340
00:13:54,949 --> 00:13:52,160
uh on the return trip back to the back

341
00:13:56,470 --> 00:13:54,959
to the earth we do a series of these uh

342
00:13:58,150 --> 00:13:56,480
correction burns that i talked about and

343
00:14:01,030 --> 00:13:58,160
it's all to make sure that we hit that

344
00:14:02,389 --> 00:14:01,040
entry interface uh target uh

345
00:14:03,750 --> 00:14:02,399
as designed

346
00:14:07,030 --> 00:14:03,760
and um

347
00:14:09,509 --> 00:14:07,040
you know i i've gone through the mission

348
00:14:11,269 --> 00:14:09,519
very quickly uh just so you know

349
00:14:12,870 --> 00:14:11,279
on those days those days where we're

350
00:14:15,509 --> 00:14:12,880
coasting the moon we're doing a lot of a

351
00:14:17,110 --> 00:14:15,519
lot of our activities we're doing a lot

352
00:14:19,350 --> 00:14:17,120
of developmental flight test objectives

353
00:14:22,150 --> 00:14:19,360
to just basically test out the onboard

354
00:14:24,790 --> 00:14:22,160
systems uh we're doing a public affairs

355
00:14:27,030 --> 00:14:24,800
outreach event every day where we maybe

356
00:14:28,870 --> 00:14:27,040
maneuver do a selfie of orion with the

357
00:14:31,430 --> 00:14:28,880
moon in the background or the or the

358
00:14:32,629 --> 00:14:31,440
earth in the background um we'll on some

359
00:14:35,670 --> 00:14:32,639
days we're going to try and catch the

360
00:14:37,269 --> 00:14:35,680
earth rise that's a spectacular image

361
00:14:38,949 --> 00:14:37,279
there's a couple of milestones

362
00:14:40,629 --> 00:14:38,959
throughout the mission uh where we

363
00:14:42,310 --> 00:14:40,639

actually enter the sphere of influence

364
00:14:44,470 --> 00:14:42,320
of the lunar you know where the lunar

365
00:14:45,670 --> 00:14:44,480
gravity really starts taking effect

366
00:14:49,189 --> 00:14:45,680
that's a milestone that we'll try to

367
00:14:50,470 --> 00:14:49,199
capture in a public affairs imagery um

368
00:14:52,310 --> 00:14:50,480
when we get the point where we're

369
00:14:54,629 --> 00:14:52,320
actually the furthest away that any

370
00:14:56,150 --> 00:14:54,639
human rated spacecraft's ever been

371
00:14:56,870 --> 00:14:56,160
further than any of the apollo vehicles

372
00:14:59,269 --> 00:14:56,880
went

373
00:15:02,150 --> 00:14:59,279
we want to capture that uh in a public

374
00:15:04,310 --> 00:15:02,160
affairs event uh so that so we'll be

375
00:15:06,629 --> 00:15:04,320
busy the whole mission um i'm gonna work

376
00:15:08,550 --> 00:15:06,639
really quick but uh yeah so once we get

377
00:15:10,870 --> 00:15:08,560
back to uh back to

378
00:15:12,389 --> 00:15:10,880
to earth we do rtc6 which sets up that

379
00:15:13,910 --> 00:15:12,399
entry interface and then i hand it back

380
00:15:15,990 --> 00:15:13,920
to judd to take you through the the rest

381
00:15:17,910 --> 00:15:16,000
of the mission thanks rick yeah as rick

382
00:15:19,910 --> 00:15:17,920
mentioned that uh return power flied by

383
00:15:21,829 --> 00:15:19,920
uh maneuver is essentially our deorbit

384
00:15:24,470 --> 00:15:21,839
burn that's way back at the moon

385
00:15:26,710 --> 00:15:24,480
uh it's about a week before uh we enter

386
00:15:28,710 --> 00:15:26,720
the earth earth's atmosphere so uh

387
00:15:29,829 --> 00:15:28,720
what's about 20 minutes before we enter

388
00:15:31,829 --> 00:15:29,839

the earth's atmosphere the entry

389
00:15:34,710 --> 00:15:31,839
interface uh we'll separate and you can

390
00:15:36,710 --> 00:15:34,720
go to the the slide there that we have

391
00:15:39,269 --> 00:15:36,720
next slide we'll separate the command

392
00:15:41,910 --> 00:15:39,279
module from the service module

393
00:15:44,069 --> 00:15:41,920
and once we perform that we'll get into

394
00:15:46,710 --> 00:15:44,079
the proper orientation we'll put the the

395
00:15:50,550 --> 00:15:48,389
command module in the proper orientation

396
00:15:53,670 --> 00:15:50,560
for entry uh we'll do a little bit of a

397
00:15:55,590 --> 00:15:53,680
set burn uh pri after the the

398
00:15:57,990 --> 00:15:55,600
command modules and service module

399
00:16:00,470 --> 00:15:58,000
separation uh that's to shallow out the

400
00:16:03,110 --> 00:16:00,480
angle uh that the the command module is

401
00:16:04,550 --> 00:16:03,120
entering uh so it's just uh just

402
00:16:06,069 --> 00:16:04,560
provides a little bit more separation

403
00:16:09,189 --> 00:16:06,079
from the service module which is gonna

404
00:16:10,870 --> 00:16:09,199
dispose in the in the pacific ocean

405
00:16:12,470 --> 00:16:10,880
uh we'll

406
00:16:14,230 --> 00:16:12,480
start our entry interface and we're

407
00:16:16,790 --> 00:16:14,240
actually doing uh what's called a skip

408
00:16:19,590 --> 00:16:16,800
entry profile so we'll uh we'll hit

409
00:16:21,350 --> 00:16:19,600
entry interface at 400 000 feet

410
00:16:23,670 --> 00:16:21,360
and then we'll immediately start to

411
00:16:25,030 --> 00:16:23,680
control the lift factor of the capsule

412
00:16:26,550 --> 00:16:25,040
such that we

413
00:16:28,550 --> 00:16:26,560

we dip a little bit in the atmosphere

414
00:16:30,389 --> 00:16:28,560
and then we come back up

415
00:16:32,310 --> 00:16:30,399
out of the atmosphere a bit

416
00:16:34,710 --> 00:16:32,320
and then come back in so we'll have two

417
00:16:35,749 --> 00:16:34,720
blackout periods of calm

418
00:16:38,150 --> 00:16:35,759
that

419
00:16:40,230 --> 00:16:38,160
due to the the plasma heating of the

420
00:16:42,310 --> 00:16:40,240
of the capsule

421
00:16:44,949 --> 00:16:42,320
once we get out of that second period uh

422
00:16:46,790 --> 00:16:44,959
we will continue to our journey towards

423
00:16:48,710 --> 00:16:46,800
uh our splashdown site which is going to

424
00:16:50,389 --> 00:16:48,720
be in san diego

425
00:16:52,629 --> 00:16:50,399
off the coast of san diego

426
00:16:54,629 --> 00:16:52,639
um we have the uh

427
00:16:56,310 --> 00:16:54,639
the uh four bay cover jettison actually

428
00:16:58,870 --> 00:16:56,320
i think that the next slide is a little

429
00:17:00,629 --> 00:16:58,880
better picture to show you the sequence

430
00:17:03,670 --> 00:17:00,639
once we get a little further down in in

431
00:17:05,990 --> 00:17:03,680
the into the atmosphere uh about 35

432
00:17:08,150 --> 00:17:06,000
five thousand feet are four big cover uh

433
00:17:10,549 --> 00:17:08,160
jettisons that brings out the drogue

434
00:17:12,549 --> 00:17:10,559
chutes and those drug shoots deploy

435
00:17:14,069 --> 00:17:12,559
around twenty four thousand feet

436
00:17:17,510 --> 00:17:14,079
uh followed by

437
00:17:20,390 --> 00:17:17,520
uh the uh the mains at about sixty 6 800

438
00:17:22,230 --> 00:17:20,400

feet and between 6 800 and and

439
00:17:24,949 --> 00:17:22,240
5600 feet

440
00:17:25,990 --> 00:17:24,959
and then we'll continue on down to 1500

441
00:17:28,630 --> 00:17:26,000
feet

442
00:17:30,470 --> 00:17:28,640
where the orion capsule will do a

443
00:17:32,310 --> 00:17:30,480
landing reorientation

444
00:17:35,029 --> 00:17:32,320
maneuver such that it'll roll the

445
00:17:37,669 --> 00:17:35,039
capsule so that we're we're going to hit

446
00:17:39,510 --> 00:17:37,679
the the waves of the of the ocean at the

447
00:17:41,909 --> 00:17:39,520
proper angle

448
00:17:44,390 --> 00:17:41,919
uh let's see and once we splash down

449
00:17:46,230 --> 00:17:44,400
we'll uh we'll leave the vehicle powered

450
00:17:48,630 --> 00:17:46,240
for about two hours we're going to do

451
00:17:50,549 --> 00:17:48,640
some testing there thermal testing to

452
00:17:52,470 --> 00:17:50,559
make sure that we have adequate cooling

453
00:17:54,870 --> 00:17:52,480
uh for astronauts when when we do

454
00:17:56,710 --> 00:17:54,880
eventually have them on board and are

455
00:17:58,150 --> 00:17:56,720
waiting to be picked up by the recovery

456
00:17:59,190 --> 00:17:58,160
crew

457
00:18:01,750 --> 00:17:59,200
and

458
00:18:03,190 --> 00:18:01,760
then uh after that two hour period uh we

459
00:18:05,029 --> 00:18:03,200
will power down the vehicle and we'll

460
00:18:06,870 --> 00:18:05,039
hand over the vehicle to melissa jones

461
00:18:10,310 --> 00:18:06,880
and her team the the recovery team uh

462
00:18:11,830 --> 00:18:10,320
that's uh that's there on on a navy boat

463
00:18:13,990 --> 00:18:11,840

so with that gary i'll hand it back to

464
00:18:16,470 --> 00:18:14,000
you thank you john thank you rick uh a

465
00:18:18,710 --> 00:18:16,480
42 day mission in 15 minutes that was uh

466
00:18:20,710 --> 00:18:18,720
that was fantastic uh thanks for the

467
00:18:22,150 --> 00:18:20,720
detailed mission overview let's go over

468
00:18:23,909 --> 00:18:22,160
to debbie korth to talk about the orion

469
00:18:25,430 --> 00:18:23,919
spacecraft okay uh good morning and

470
00:18:26,870 --> 00:18:25,440
thank you guys for being here it's great

471
00:18:29,029 --> 00:18:26,880
to see this room full of people and see

472
00:18:30,549 --> 00:18:29,039
all the excitement about this mission um

473
00:18:32,470 --> 00:18:30,559
very exciting time for nasa a very

474
00:18:33,590 --> 00:18:32,480
exciting time for orion i've been

475
00:18:34,870 --> 00:18:33,600
working on this for a long time and

476
00:18:36,630 --> 00:18:34,880
really looking forward to where we're

477
00:18:38,150 --> 00:18:36,640
going to go on this mission just 24 days

478
00:18:39,990 --> 00:18:38,160
from now headed back to the moon so it's

479
00:18:42,390 --> 00:18:40,000
just amazing

480
00:18:43,990 --> 00:18:42,400
so let's go to the next uh animation

481
00:18:46,070 --> 00:18:44,000
we've got some graphic here to kind of

482
00:18:48,230 --> 00:18:46,080
explain the the pieces of the orion crew

483
00:18:50,630 --> 00:18:48,240
mod the ryan vehicle it's made up of

484
00:18:53,350 --> 00:18:50,640
three main elements um

485
00:18:54,470 --> 00:18:53,360
is there an animation that we can show

486
00:18:57,350 --> 00:18:54,480
yeah let's see

487
00:18:59,350 --> 00:18:57,360
there we go okay thank you um so made up

488
00:19:01,029 --> 00:18:59,360

of three main modules the crew module

489
00:19:02,870 --> 00:19:01,039
the launch abort system and the service

490
00:19:04,549 --> 00:19:02,880
module so um you've heard the crew

491
00:19:06,549 --> 00:19:04,559
module also referred to as the command

492
00:19:09,510 --> 00:19:06,559
module that's that silver capsule there

493
00:19:11,669 --> 00:19:09,520
in the center um the silver surfaces you

494
00:19:14,549 --> 00:19:11,679
see are back shells it's made of about 1

495
00:19:16,070 --> 00:19:14,559
300 silica tiles very similar to what we

496
00:19:17,270 --> 00:19:16,080
flew on the bottom of the shuttle during

497
00:19:19,110 --> 00:19:17,280
the shuttle days

498
00:19:21,190 --> 00:19:19,120
and it's covered in some paint and some

499
00:19:22,789 --> 00:19:21,200
psyox tapes and aluminum tape to help

500
00:19:24,390 --> 00:19:22,799
with thermal protection

501
00:19:25,510 --> 00:19:24,400
so that's kind of what you see there on

502
00:19:27,029 --> 00:19:25,520
the outside

503
00:19:28,310 --> 00:19:27,039
on the bottom of the crew module you'll

504
00:19:29,669 --> 00:19:28,320
you'll see

505
00:19:31,430 --> 00:19:29,679
the heat shield that we've talked about

506
00:19:33,590 --> 00:19:31,440
being one of our primary test objectives

507
00:19:35,029 --> 00:19:33,600
on this flight it's 16 and a half feet

508
00:19:36,950 --> 00:19:35,039
in diameter so it's the biggest heat

509
00:19:39,110 --> 00:19:36,960
shield we've ever built it ablates some

510
00:19:41,110 --> 00:19:39,120
material away as we re-enter

511
00:19:43,110 --> 00:19:41,120
the crew module also has its own small

512
00:19:44,789 --> 00:19:43,120
propulsion system it's got several

513
00:19:46,789 --> 00:19:44,799

reaction control system jets that

514
00:19:48,870 --> 00:19:46,799
perform those type of maneuvers that

515
00:19:50,950 --> 00:19:48,880
rick alluded to on the re-entry when we

516
00:19:53,669 --> 00:19:50,960
have to orient to the right orientation

517
00:19:55,350 --> 00:19:53,679
before landing parachutes 11 total

518
00:19:57,430 --> 00:19:55,360
parachutes that you just saw pictures of

519
00:19:59,750 --> 00:19:57,440
that deploy in a very sequent time

520
00:20:02,310 --> 00:19:59,760
sequence to slow the vehicle down from

521
00:20:04,470 --> 00:20:02,320
about 350 miles per hour down to less

522
00:20:06,310 --> 00:20:04,480
than 20 when we hit the water

523
00:20:08,230 --> 00:20:06,320
which reed'll be happy that we're at

524
00:20:10,470 --> 00:20:08,240
that speed hitting the water

525
00:20:12,070 --> 00:20:10,480
um pyrotechnics throughout the

526
00:20:13,669 --> 00:20:12,080
the vehicle we talk about you know

527
00:20:15,110 --> 00:20:13,679
jettisoning things like the launch abort

528
00:20:17,110 --> 00:20:15,120
system or the service module when we're

529
00:20:19,190 --> 00:20:17,120
done with it we use these pyrotechnic

530
00:20:21,190 --> 00:20:19,200
devices that help uh separate make those

531
00:20:22,390 --> 00:20:21,200
vehicle separations and then when you go

532
00:20:23,990 --> 00:20:22,400
inside the cabin you've got your

533
00:20:25,510 --> 00:20:24,000
environmental control and life support

534
00:20:27,430 --> 00:20:25,520
system so everything that controls

535
00:20:29,669 --> 00:20:27,440
pressure temperature and humidity inside

536
00:20:31,430 --> 00:20:29,679
the the volume um that crew module is

537
00:20:33,590 --> 00:20:31,440
designed to hold four crew members for

538
00:20:35,029 --> 00:20:33,600

21 days and so obviously on artemis one

539
00:20:36,950 --> 00:20:35,039
we're flying uncrew this is our test

540
00:20:39,830 --> 00:20:36,960
flight so expect to learn a whole lot

541
00:20:41,830 --> 00:20:39,840
about how these systems work um inside

542
00:20:43,590 --> 00:20:41,840
the the vehicle also there's avionic

543
00:20:45,990 --> 00:20:43,600
systems our guidance navigation and

544
00:20:47,990 --> 00:20:46,000
control communication systems which are

545
00:20:49,590 --> 00:20:48,000
a lot different than you know the gps

546
00:20:51,990 --> 00:20:49,600
you probably used your map to get here

547
00:20:53,430 --> 00:20:52,000
today it doesn't work outside of the

548
00:20:56,149 --> 00:20:53,440
distances we're going so we're using a

549
00:20:58,390 --> 00:20:56,159
deep space network kind of

550
00:21:00,390 --> 00:20:58,400
a system for our communications and then

551
00:21:01,669 --> 00:21:00,400
several uh payloads that we're flying on

552
00:21:03,510 --> 00:21:01,679
this flight

553
00:21:05,190 --> 00:21:03,520
one several of which are in the crew

554
00:21:07,190 --> 00:21:05,200
seat location so we won't be flying crew

555
00:21:09,669 --> 00:21:07,200
we'll be flying some mannequins and some

556
00:21:11,830 --> 00:21:09,679
torsos that are simulated human tissue

557
00:21:13,909 --> 00:21:11,840
and organs they're looking at radiation

558
00:21:16,070 --> 00:21:13,919
protection radiation environment the

559
00:21:17,590 --> 00:21:16,080
acceleration of the the vehicle and how

560
00:21:19,190 --> 00:21:17,600
that affects the human body because our

561
00:21:20,310 --> 00:21:19,200
goal is for the crude flight on artemis

562
00:21:22,630 --> 00:21:20,320
2.

563
00:21:25,510 --> 00:21:22,640

um for future crude flights uh won't be

564
00:21:27,190 --> 00:21:25,520
on this mission but we'll be adding in a

565
00:21:29,350 --> 00:21:27,200
waste management system a galley and

566
00:21:30,950 --> 00:21:29,360
exercise equipment offer for crew health

567
00:21:32,870 --> 00:21:30,960
and and

568
00:21:37,830 --> 00:21:32,880
comfort and safety during the mission

569
00:21:40,789 --> 00:21:39,270
so this is the um

570
00:21:43,270 --> 00:21:40,799
the the crew module in the service

571
00:21:44,710 --> 00:21:43,280
module located in our factory at the onc

572
00:21:47,110 --> 00:21:44,720
this is before we installed the launch

573
00:21:48,390 --> 00:21:47,120
abort system um

574
00:21:49,590 --> 00:21:48,400
so uh

575
00:21:50,630 --> 00:21:49,600
you know artemis one as you know we're

576
00:21:52,149 --> 00:21:50,640
testing all these systems and

577
00:21:53,510 --> 00:21:52,159
capabilities and this will be the kind

578
00:21:55,430 --> 00:21:53,520
of configuration of the vehicle that'll

579
00:21:57,430 --> 00:21:55,440
be available mostly during the the

580
00:21:58,870 --> 00:21:57,440
mission that we're talking

581
00:22:00,789 --> 00:21:58,880
one of the main objectives you've heard

582
00:22:03,270 --> 00:22:00,799
is about the heat shield and so the heat

583
00:22:05,190 --> 00:22:03,280
shield is um

584
00:22:06,950 --> 00:22:05,200
the vehicle comes back at about 25 000

585
00:22:08,470 --> 00:22:06,960
miles per hour and we end up at

586
00:22:11,990 --> 00:22:08,480
temperatures about 5000 degrees

587
00:22:13,350 --> 00:22:12,000
fahrenheit which is about half the the

588
00:22:14,310 --> 00:22:13,360

temperature of the surface of the sun so

589
00:22:16,870 --> 00:22:14,320
we're talking about very high

590
00:22:19,510 --> 00:22:16,880
temperatures we're trying to protect for

591
00:22:21,270 --> 00:22:19,520
so we we have a block design for this

592
00:22:23,750 --> 00:22:21,280
heat shield it's made up of these abco

593
00:22:25,190 --> 00:22:23,760
blocks that are adhered to the to a skin

594
00:22:26,870 --> 00:22:25,200
and a skeleton and we'll be testing that

595
00:22:27,669 --> 00:22:26,880
as one of the main objectives but of

596
00:22:28,789 --> 00:22:27,679
course you know when we look at the

597
00:22:30,390 --> 00:22:28,799
spacecraft we talked about some of the

598
00:22:32,630 --> 00:22:30,400
other objectives as well and you can see

599
00:22:33,990 --> 00:22:32,640
the solar arrays here folded up against

600
00:22:35,110 --> 00:22:34,000
the vehicle

601
00:22:36,789 --> 00:22:35,120
we'll be doing what's called the modal

602
00:22:38,310 --> 00:22:36,799
survey of those solar arrays once

603
00:22:40,710 --> 00:22:38,320
they're deployed and looking at how they

604
00:22:42,149 --> 00:22:40,720
respond to different jet firings engine

605
00:22:43,430 --> 00:22:42,159
firings to make sure they can handle the

606
00:22:45,669 --> 00:22:43,440
vibrations and the loads that they'll

607
00:22:46,950 --> 00:22:45,679
see throughout the mission profile

608
00:22:48,549 --> 00:22:46,960
checking out all of our guidance and

609
00:22:50,149 --> 00:22:48,559
navigation and control and then

610
00:22:52,470 --> 00:22:50,159
obviously the parachute systems as we

611
00:22:55,750 --> 00:22:52,480
come back in

612
00:22:57,750 --> 00:22:55,760
okay next slide

613
00:22:59,590 --> 00:22:57,760

so the next picture is the the vehicle

614
00:23:01,430 --> 00:22:59,600
as it came into the vehicle or the

615
00:23:03,029 --> 00:23:01,440
vertical assembly building there at ksc

616
00:23:05,110 --> 00:23:03,039
so it looks a lot different now we've

617
00:23:06,390 --> 00:23:05,120
got the fairings around the crew module

618
00:23:08,870 --> 00:23:06,400
and service module and we've got the

619
00:23:10,549 --> 00:23:08,880
launch abort system mounted on top so

620
00:23:12,549 --> 00:23:10,559
the launch abort system i didn't talk

621
00:23:14,390 --> 00:23:12,559
about that previously it's uh designed

622
00:23:16,310 --> 00:23:14,400
to pull the crew capsule away in case

623
00:23:18,789 --> 00:23:16,320
there is an emergency on either the

624
00:23:20,950 --> 00:23:18,799
launch pad or during the ascent phase so

625
00:23:22,870 --> 00:23:20,960
it's made up of three solid rocket

626
00:23:24,149 --> 00:23:22,880
motors the first is the abort motor and

627
00:23:25,909 --> 00:23:24,159
that's what actually pulls the crew

628
00:23:28,549 --> 00:23:25,919
member away um

629
00:23:31,029 --> 00:23:28,559
very powerful it goes from zero to 400

630
00:23:32,789 --> 00:23:31,039
miles per hour in two seconds so talking

631
00:23:34,390 --> 00:23:32,799
very quick trying to you know really

632
00:23:36,789 --> 00:23:34,400
trying to outrun an sls that might be

633
00:23:38,710 --> 00:23:36,799
having an issue during launch um at the

634
00:23:40,950 --> 00:23:38,720
top of the sl of the top of the last

635
00:23:42,789 --> 00:23:40,960
system is the attitude control motor and

636
00:23:45,269 --> 00:23:42,799
that's what's used once it is separated

637
00:23:47,510 --> 00:23:45,279
from the the hazardous event it steers

638
00:23:49,430 --> 00:23:47,520

the the crew module away and allows it

639
00:23:50,789 --> 00:23:49,440
to get to a safe location and then

640
00:23:52,390 --> 00:23:50,799
finally the jettison motor which would

641
00:23:54,630 --> 00:23:52,400
jettison the launch support system from

642
00:23:56,789 --> 00:23:54,640
the crew module so on artemis one that

643
00:23:57,909 --> 00:23:56,799
jettison motor is the only active motor

644
00:23:59,590 --> 00:23:57,919
we don't plan on using the other

645
00:24:00,549 --> 00:23:59,600
functions this is a non-crew flight so

646
00:24:02,470 --> 00:24:00,559
we didn't

647
00:24:03,669 --> 00:24:02,480
put those motors on the vehicle but the

648
00:24:05,110 --> 00:24:03,679
jettison motor is the one that works

649
00:24:06,710 --> 00:24:05,120
every flight so it's either you know

650
00:24:08,230 --> 00:24:06,720
eventually you take the last off whether

651
00:24:10,390 --> 00:24:08,240
you're in a nominal flight or in an

652
00:24:14,950 --> 00:24:10,400
emergency situation

653
00:24:17,350 --> 00:24:14,960
um okay i think we can uh let's see

654
00:24:19,110 --> 00:24:17,360
think of the next slide

655
00:24:20,549 --> 00:24:19,120
so this is a picture of us rolling out

656
00:24:22,470 --> 00:24:20,559
to the pad for one of the wet dress

657
00:24:25,590 --> 00:24:22,480
rehearsals you know before we got to

658
00:24:27,830 --> 00:24:25,600
this point um every component every

659
00:24:29,590 --> 00:24:27,840
system every module on the spacecraft

660
00:24:31,510 --> 00:24:29,600
has been thoroughly tested

661
00:24:33,350 --> 00:24:31,520
we've done over 48

662
00:24:34,789 --> 00:24:33,360
engine tests between the aux engines and

663
00:24:36,549 --> 00:24:34,799

the main engine that we talked about to

664
00:24:37,590 --> 00:24:36,559
make sure we have a robust propulsion

665
00:24:41,430 --> 00:24:37,600
system

666
00:24:43,510 --> 00:24:41,440
different drop tests that we did you

667
00:24:45,110 --> 00:24:43,520
know chunking capsules and lawn darts

668
00:24:46,950 --> 00:24:45,120
out the back of

669
00:24:48,789 --> 00:24:46,960
military aircraft making sure that we

670
00:24:50,789 --> 00:24:48,799
can handle every parameter things like

671
00:24:52,710 --> 00:24:50,799
shoots out or different wind conditions

672
00:24:54,710 --> 00:24:52,720
wave conditions i'm looking at all of

673
00:24:57,350 --> 00:24:54,720
that through that test program

674
00:24:58,950 --> 00:24:57,360
literally thousands of hours of avionics

675
00:25:01,029 --> 00:24:58,960
and software testing in the laboratories

676
00:25:02,549 --> 00:25:01,039
here at jsc and at denver where our

677
00:25:03,590 --> 00:25:02,559
lockheed martin prime contractor is

678
00:25:05,110 --> 00:25:03,600
located

679
00:25:07,830 --> 00:25:05,120
and then we took the entire spacecraft

680
00:25:09,750 --> 00:25:07,840
to a thermal vacuum chamber at up at

681
00:25:12,149 --> 00:25:09,760
glenn research center the armstrong test

682
00:25:14,789 --> 00:25:12,159
facility and it spent over 47 days in

683
00:25:16,549 --> 00:25:14,799
that chamber just really wringing it out

684
00:25:18,630 --> 00:25:16,559
testing every aspect of the temperatures

685
00:25:20,950 --> 00:25:18,640
that we'll see the vacuum the pressures

686
00:25:22,710 --> 00:25:20,960
acoustics and so really have spent a lot

687
00:25:24,149 --> 00:25:22,720
of time testing this at the component

688
00:25:26,230 --> 00:25:24,159

and module level

689
00:25:27,990 --> 00:25:26,240
if you've been following our artemis for

690
00:25:29,909 --> 00:25:28,000
a while you also know we did three

691
00:25:31,590 --> 00:25:29,919
flight tests we've done two complete

692
00:25:33,350 --> 00:25:31,600
flight tests of our launch abort system

693
00:25:35,830 --> 00:25:33,360
so one was a paddleboard one which was

694
00:25:38,390 --> 00:25:35,840
looking at performance from a pad escape

695
00:25:39,990 --> 00:25:38,400
and one was the acid abort two which was

696
00:25:41,990 --> 00:25:40,000
looking at it during that very dynamic

697
00:25:44,310 --> 00:25:42,000
phase of the ascent and then finally we

698
00:25:46,310 --> 00:25:44,320
had our exploration flight test one that

699
00:25:48,070 --> 00:25:46,320
happened um several a few years ago that

700
00:25:49,430 --> 00:25:48,080
tested out most of the crew module

701
00:25:51,190 --> 00:25:49,440
systems and obviously we've added things

702
00:25:52,630 --> 00:25:51,200
today and we've also added our service

703
00:25:54,070 --> 00:25:52,640
module

704
00:25:54,950 --> 00:25:54,080
um

705
00:25:57,190 --> 00:25:54,960
okay i think you can go to the next

706
00:25:59,590 --> 00:25:57,200
slide

707
00:26:00,950 --> 00:25:59,600
so here we are on the pad this is our

708
00:26:02,549 --> 00:26:00,960
the last picture we took before we

709
00:26:04,549 --> 00:26:02,559
rolled back into the vib and i just love

710
00:26:06,789 --> 00:26:04,559
this photo you know it gives me pills to

711
00:26:09,350 --> 00:26:06,799
see this um moon in the background our

712
00:26:11,510 --> 00:26:09,360
destination sort of calling to us

713
00:26:13,750 --> 00:26:11,520

just a huge amount of collaboration

714
00:26:16,230 --> 00:26:13,760
testing and energy and effort that's

715
00:26:17,990 --> 00:26:16,240
gone into putting this together

716
00:26:19,750 --> 00:26:18,000
you know we've had over

717
00:26:21,669 --> 00:26:19,760
i mean i'd say three to four thousand

718
00:26:23,510 --> 00:26:21,679
suppliers in every every state of the

719
00:26:25,830 --> 00:26:23,520
united states so really just a huge

720
00:26:27,510 --> 00:26:25,840
effort across our country um also have a

721
00:26:29,909 --> 00:26:27,520
very strong partnership with our

722
00:26:31,510 --> 00:26:29,919
europeans on the european service module

723
00:26:34,149 --> 00:26:31,520
so didn't talk a lot about the service

724
00:26:35,669 --> 00:26:34,159
module um our philippe du lou who's the

725
00:26:37,110 --> 00:26:35,679
the manager of the service module

726
00:26:39,190 --> 00:26:37,120
program is online so i'll be handing

727
00:26:41,669 --> 00:26:39,200
over to him to let him talk through the

728
00:26:43,510 --> 00:26:41,679
details there but um you know we're

729
00:26:45,909 --> 00:26:43,520
rolling out on the 18th and just looking

730
00:26:47,110 --> 00:26:45,919
forward to this flight and and

731
00:26:48,950 --> 00:26:47,120
everything that we'll be learning from

732
00:26:50,470 --> 00:26:48,960
it so felipe if you'd like to talk

733
00:26:52,310 --> 00:26:50,480
through the service module that would be

734
00:26:56,149 --> 00:26:52,320
great thanks

735
00:27:01,269 --> 00:26:57,669
so uh

736
00:27:03,669 --> 00:27:01,279
we also at the european space agency are

737
00:27:05,190 --> 00:27:03,679
very excited about this upcoming mission

738
00:27:07,029 --> 00:27:05,200

uh which

739
00:27:08,630 --> 00:27:07,039
will be

740
00:27:10,230 --> 00:27:08,640
uh let's see

741
00:27:13,750 --> 00:27:10,240
coming with

742
00:27:19,110 --> 00:27:13,760
after 10 years we started this program

743
00:27:25,830 --> 00:27:22,789
sorry i have a blank yes so um i would

744
00:27:27,430 --> 00:27:25,840
have loved to be in johnson in person uh

745
00:27:29,750 --> 00:27:27,440
in order to

746
00:27:32,630 --> 00:27:29,760
take this media event

747
00:27:35,110 --> 00:27:32,640
but i'm taking it here from

748
00:27:37,190 --> 00:27:35,120
the research center at the european

749
00:27:39,990 --> 00:27:37,200
space agency here in holland in the

750
00:27:44,310 --> 00:27:40,000
mission room that our engineer

751
00:27:48,070 --> 00:27:45,669
this is in addition to the team that

752
00:27:51,830 --> 00:27:48,080
will be in kennedy

753
00:27:56,389 --> 00:27:53,669
so as debbie said

754
00:27:59,269 --> 00:27:56,399
the service module is one

755
00:28:03,190 --> 00:27:59,279
part of the orion vehicle

756
00:28:06,710 --> 00:28:03,200
and we're extremely proud at esa that

757
00:28:09,110 --> 00:28:06,720
nasa has trusted us and our industry to

758
00:28:10,789 --> 00:28:09,120
provide critical function to the

759
00:28:13,350 --> 00:28:10,799
orion vehicle

760
00:28:14,870 --> 00:28:13,360
those critical functions are the

761
00:28:17,750 --> 00:28:14,880
propulsion

762
00:28:19,350 --> 00:28:17,760
the terminal control system

763
00:28:20,950 --> 00:28:19,360

the

764
00:28:23,669 --> 00:28:20,960
power generation

765
00:28:25,190 --> 00:28:23,679
and the storage of consumable for the

766
00:28:29,510 --> 00:28:25,200
crew

767
00:28:31,029 --> 00:28:29,520
so the service module has 33 engine

768
00:28:33,269 --> 00:28:31,039
one main engine

769
00:28:36,230 --> 00:28:33,279
which is an engine recovered from the

770
00:28:39,669 --> 00:28:36,240
shuttle this is the orbital maneuvering

771
00:28:42,470 --> 00:28:39,679
system of the shuttle

772
00:28:45,430 --> 00:28:42,480
and then eight auxiliary engine

773
00:28:47,669 --> 00:28:45,440
those eight auxiliary engine are also a

774
00:28:49,269 --> 00:28:47,679
backup in case of anomaly of the main

775
00:28:53,830 --> 00:28:49,279
engine

776
00:28:55,029 --> 00:28:53,840
the attitude control

777
00:28:57,510 --> 00:28:55,039
and

778
00:28:59,750 --> 00:28:57,520
attitude correction

779
00:29:03,269 --> 00:28:59,760
during the mission

780
00:29:05,430 --> 00:29:03,279
the propulsion system also includes uh

781
00:29:08,070 --> 00:29:05,440
propellant tanks uh

782
00:29:11,190 --> 00:29:08,080
we can store 8.4

783
00:29:14,070 --> 00:29:11,200
8.6 sorry tons of propellants

784
00:29:16,310 --> 00:29:14,080
and the pressurization system

785
00:29:19,350 --> 00:29:16,320
now moving to the turbo control system

786
00:29:21,990 --> 00:29:19,360
this is a free loop a full loop where a

787
00:29:24,549 --> 00:29:22,000
pump is pumping fluid

788
00:29:27,350 --> 00:29:24,559

and distributing this fluid

789
00:29:29,190 --> 00:29:27,360
within the esm the main

790
00:29:31,269 --> 00:29:29,200
one of the main function of this foot

791
00:29:32,789 --> 00:29:31,279
loop is to reject the heat from the

792
00:29:35,990 --> 00:29:32,799
service module

793
00:29:38,230 --> 00:29:36,000
uh avionics equipment

794
00:29:40,950 --> 00:29:38,240
but also from the crew module in order

795
00:29:43,430 --> 00:29:40,960
to keep a comfortable environment for

796
00:29:48,310 --> 00:29:45,110
the next

797
00:29:50,549 --> 00:29:48,320
function is the power generation

798
00:29:52,149 --> 00:29:50,559
this is of course provided by the solar

799
00:29:55,909 --> 00:29:52,159
panels

800
00:29:58,149 --> 00:29:55,919
of

801
00:29:59,669 --> 00:29:58,159
power

802
00:30:02,870 --> 00:29:59,679
this is

803
00:30:04,149 --> 00:30:02,880
it provides basically in an hour more

804
00:30:05,590 --> 00:30:04,159
than you need

805
00:30:07,190 --> 00:30:05,600
in order to

806
00:30:08,710 --> 00:30:07,200
supply the

807
00:30:09,590 --> 00:30:08,720
need of a home

808
00:30:13,750 --> 00:30:09,600
for

809
00:30:18,149 --> 00:30:16,389
so in addition to the solar panel uh

810
00:30:20,549 --> 00:30:18,159
there is

811
00:30:23,190 --> 00:30:20,559
a power conditioning system in order to

812
00:30:25,269 --> 00:30:23,200
condition the the power and distribute

813
00:30:27,430 --> 00:30:25,279

it to the service module but also to the

814
00:30:29,750 --> 00:30:27,440
crew module

815
00:30:31,110 --> 00:30:29,760
and finally the

816
00:30:41,909 --> 00:30:31,120
the

817
00:30:44,950 --> 00:30:41,919
artemis 2 mission plus

818
00:30:47,510 --> 00:30:44,960
this will provide water

819
00:30:50,549 --> 00:30:47,520
oxygen and nitrogen

820
00:30:53,110 --> 00:30:50,559
for these this artemis one mission uh we

821
00:30:56,389 --> 00:30:53,120
will only know load sorry

822
00:30:59,029 --> 00:30:56,399
nitrogen and tank there will be no

823
00:31:01,990 --> 00:30:59,039
oxygen tank and the water tank will be

824
00:31:02,000 --> 00:31:06,310
next slide

825
00:31:11,190 --> 00:31:08,230
so this is another picture

826
00:31:13,590 --> 00:31:11,200
than the one showed by debbie uh it's a

827
00:31:14,630 --> 00:31:13,600
bit earlier in the integration phase and

828
00:31:16,070 --> 00:31:14,640
kennedy

829
00:31:18,710 --> 00:31:16,080
so it

830
00:31:20,470 --> 00:31:18,720
was not already mounted on the

831
00:31:22,950 --> 00:31:20,480
spacecraft adapter and the solary were

832
00:31:26,230 --> 00:31:22,960
not there

833
00:31:28,710 --> 00:31:26,240
so it was just uh right after

834
00:31:30,230 --> 00:31:28,720
the mating of the crew module to the

835
00:31:31,509 --> 00:31:30,240
service module

836
00:31:34,389 --> 00:31:31,519
so this is

837
00:31:35,269 --> 00:31:34,399
artemis one or ra the orion for artemis

838
00:31:36,149 --> 00:31:35,279

one

839
00:31:38,630 --> 00:31:36,159
the

840
00:31:42,230 --> 00:31:38,640
service module for that

841
00:31:44,870 --> 00:31:42,240
vehicle was delivered in 2018

842
00:31:46,870 --> 00:31:44,880
the service module for artemis ii

843
00:31:49,430 --> 00:31:46,880
has also been delivered and is now in

844
00:31:52,070 --> 00:31:49,440
kenny and the integration has

845
00:31:54,230 --> 00:31:52,080
been delivered last year in 2021

846
00:31:56,630 --> 00:31:54,240
right now the third service module is

847
00:31:58,549 --> 00:31:56,640
being built in baiman and will be

848
00:32:00,310 --> 00:31:58,559
delivered to kennedy

849
00:32:02,230 --> 00:32:00,320
in 2023

850
00:32:06,230 --> 00:32:02,240
and then the

851
00:32:07,990 --> 00:32:06,240
service module for esm4 to 9 and

852
00:32:09,590 --> 00:32:08,000
will follow with the early cadence from

853
00:32:13,029 --> 00:32:09,600
there on

854
00:32:17,590 --> 00:32:15,190
so this is a picture that

855
00:32:19,669 --> 00:32:17,600
has been already presented and here i

856
00:32:20,710 --> 00:32:19,679
will emphasize a bit more

857
00:32:21,509 --> 00:32:20,720
on

858
00:32:23,830 --> 00:32:21,519
what

859
00:32:26,230 --> 00:32:23,840
will happen for the service module

860
00:32:28,230 --> 00:32:26,240
uh i will not insist on the propulsion i

861
00:32:33,669 --> 00:32:28,240
think the propulsion has already been

862
00:32:39,029 --> 00:32:36,310
the uh

863
00:32:41,430 --> 00:32:39,039

i presented four functions of the the

864
00:32:44,549 --> 00:32:41,440
service module those four functions will

865
00:32:46,630 --> 00:32:44,559
be verified once on orbit

866
00:32:48,389 --> 00:32:46,640
uh for example for the thermal system we

867
00:32:50,789 --> 00:32:48,399
will check out that everything is

868
00:32:53,909 --> 00:32:50,799
functioning uh nominally

869
00:32:55,590 --> 00:32:53,919
uh we will also verify that our

870
00:32:57,669 --> 00:32:55,600
prediction of

871
00:33:00,710 --> 00:32:57,679
the thermal

872
00:33:03,350 --> 00:33:00,720
behavior of the vehicle is as expected

873
00:33:05,830 --> 00:33:03,360
or whether they are things that we

874
00:33:06,630 --> 00:33:05,840
did not predict properly and will need

875
00:33:10,470 --> 00:33:06,640
to

876
00:33:12,230 --> 00:33:10,480
prediction

877
00:33:15,110 --> 00:33:12,240
same thing for the

878
00:33:19,269 --> 00:33:16,310
one

879
00:33:22,870 --> 00:33:19,279
feature which is unusual on the

880
00:33:25,029 --> 00:33:22,880
spacecraft is that the survey has two

881
00:33:27,990 --> 00:33:25,039
gimbal axes

882
00:33:30,070 --> 00:33:28,000
so not only you can track the sun

883
00:33:32,389 --> 00:33:30,080
by rotating the celery on their axis

884
00:33:35,430 --> 00:33:32,399
which is usually what other spacecraft

885
00:33:38,470 --> 00:33:35,440
do but also you can cant the surrey

886
00:33:39,830 --> 00:33:38,480
forward and backwards and this is needed

887
00:33:42,789 --> 00:33:39,840
for two reasons

888
00:33:45,029 --> 00:33:42,799

one reason is during the big burns

889
00:33:47,190 --> 00:33:45,039
because structurally the solaris would

890
00:33:48,470 --> 00:33:47,200
not be able to withstand the loads if

891
00:33:52,870 --> 00:33:48,480
they are

892
00:33:55,830 --> 00:33:52,880
at 90 degree of the service module

893
00:33:58,389 --> 00:33:55,840
but second it allows to have a better

894
00:34:01,350 --> 00:33:58,399
tracking of the sun when the vehicle

895
00:34:03,190 --> 00:34:01,360
needs to have a specific attitude for

896
00:34:06,789 --> 00:34:03,200
instance when the vehicle will be

897
00:34:11,990 --> 00:34:09,589
also as i told you uh

898
00:34:15,190 --> 00:34:12,000
we will have nitrogen on board and the

899
00:34:17,349 --> 00:34:15,200
reason why we will have nitrogen boarded

900
00:34:20,629 --> 00:34:17,359
is because there is a major verification

901
00:34:23,190 --> 00:34:20,639
to be made is that in case of a

902
00:34:25,030 --> 00:34:23,200
depressed accidental depress

903
00:34:26,869 --> 00:34:25,040
of the crew module

904
00:34:29,270 --> 00:34:26,879
for any reason

905
00:34:33,349 --> 00:34:29,280
uh we want to check that we are able to

906
00:34:37,829 --> 00:34:33,359
repress the the vehicle with nitrogen

907
00:34:39,909 --> 00:34:39,109
and

908
00:34:41,829 --> 00:34:39,919
yes

909
00:34:43,510 --> 00:34:41,839
once we've completed the

910
00:34:46,069 --> 00:34:43,520
the mission

911
00:34:49,349 --> 00:34:46,079
the service module will separate and

912
00:34:51,750 --> 00:34:49,359
unfortunately will burn in re-entry

913
00:34:54,629 --> 00:34:51,760

in the atmosphere and

914
00:34:57,829 --> 00:34:54,639
will fall in small pieces of dust in the

915
00:35:02,630 --> 00:35:00,710
and that concludes my presentation my

916
00:35:04,390 --> 00:35:02,640
short presentation of the service module

917
00:35:05,750 --> 00:35:04,400
the european service module

918
00:35:14,310 --> 00:35:05,760
and

919
00:35:16,630 --> 00:35:14,320
as well for giving us insight into the

920
00:35:18,150 --> 00:35:16,640
orion spacecraft and the european

921
00:35:19,750 --> 00:35:18,160
service module so we've taken a look at

922
00:35:21,910 --> 00:35:19,760
the mission profile we've taken a look

923
00:35:23,910 --> 00:35:21,920
at the spacecraft let's now go over to

924
00:35:25,750 --> 00:35:23,920
melissa jones over at the kennedy space

925
00:35:28,829 --> 00:35:25,760
center to take a look at recovery

926
00:35:33,990 --> 00:35:31,589
melissa thank you hello everyone uh it's

927
00:35:35,510 --> 00:35:34,000
my pleasure today to be here to talk to

928
00:35:36,950 --> 00:35:35,520
you about the recovery operations that

929
00:35:39,349 --> 00:35:36,960
we're going to do in order to recover

930
00:35:41,510 --> 00:35:39,359
this artemis one orion capsule for the

931
00:35:42,710 --> 00:35:41,520
past several years the team based here

932
00:35:45,510 --> 00:35:42,720
at kennedy space center have been

933
00:35:47,910 --> 00:35:45,520
working with the u.s navy to refine

934
00:35:49,750 --> 00:35:47,920
to create refine and practice our

935
00:35:50,630 --> 00:35:49,760
recovery operations to get the capsule

936
00:35:52,310 --> 00:35:50,640
back

937
00:35:54,790 --> 00:35:52,320
when it lands

938
00:35:57,430 --> 00:35:54,800

for artemis one just last fall we

939
00:36:00,630 --> 00:35:57,440
completed our final test called underway

940
00:36:02,550 --> 00:36:00,640
recovery test 9 aboard the uss martha

941
00:36:04,870 --> 00:36:02,560
and that certified us to do these

942
00:36:07,750 --> 00:36:04,880
recovery operations

943
00:36:10,550 --> 00:36:07,760
these recovery tests allow us to

944
00:36:12,950 --> 00:36:10,560
experience life aboard a navy vessel for

945
00:36:15,990 --> 00:36:12,960
six to eight days as we are practicing

946
00:36:18,390 --> 00:36:16,000
with a full-size orion mock-up

947
00:36:21,109 --> 00:36:18,400
and we practice over and over again what

948
00:36:23,030 --> 00:36:21,119
will happen on splash day to refine

949
00:36:24,710 --> 00:36:23,040
how we work with the capsule and

950
00:36:26,790 --> 00:36:24,720
integrate with the navy

951
00:36:28,870 --> 00:36:26,800
we have a decades-long partnership nasa

952
00:36:30,790 --> 00:36:28,880
does with the navy as i'm sure you know

953
00:36:32,630 --> 00:36:30,800
from our time with apollo

954
00:36:35,190 --> 00:36:32,640
recovering human space flight missions

955
00:36:36,790 --> 00:36:35,200
and this artemis program will just build

956
00:36:38,069 --> 00:36:36,800
on that experience that we have with

957
00:36:41,270 --> 00:36:38,079
them

958
00:36:44,710 --> 00:36:41,280
so speaking of that so nasa chose the um

959
00:36:46,870 --> 00:36:44,720
navy's um lpd landing platform dot class

960
00:36:49,510 --> 00:36:46,880
ship specifically because of the well

961
00:36:51,349 --> 00:36:49,520
deck that it has the helicopter pad its

962
00:36:53,190 --> 00:36:51,359
onboard medical facilities and the

963
00:36:56,310 --> 00:36:53,200

communication capabilities you can see a

964
00:36:59,750 --> 00:36:58,310
this class of ship also provides us the

965
00:37:01,829 --> 00:36:59,760
communication

966
00:37:03,829 --> 00:37:01,839
assets that we need to communicate back

967
00:37:06,069 --> 00:37:03,839
with the flight control team

968
00:37:08,550 --> 00:37:06,079
at jsc you heard judd talk about it

969
00:37:10,630 --> 00:37:08,560
earlier so on recovery day we will be in

970
00:37:14,069 --> 00:37:10,640
communication with his team

971
00:37:16,310 --> 00:37:14,079
listening for burns as they happen and

972
00:37:17,349 --> 00:37:16,320
information that will allow us to know

973
00:37:19,030 --> 00:37:17,359
what are we going to get when the

974
00:37:20,710 --> 00:37:19,040
capsule lands from a health and status

975
00:37:22,550 --> 00:37:20,720
perspective

976
00:37:25,670 --> 00:37:22,560
during the mission the capsule will

977
00:37:27,750 --> 00:37:25,680
travel about 25 000 miles an hour before

978
00:37:29,990 --> 00:37:27,760
slowing to 300 miles an hour after

979
00:37:32,390 --> 00:37:30,000
entering the earth's atmosphere and when

980
00:37:34,390 --> 00:37:32,400
the parachutes deploy we're expecting it

981
00:37:36,550 --> 00:37:34,400
to slow to about 20 miles an hour before

982
00:37:37,589 --> 00:37:36,560
it glides into the pacific or we'll go

983
00:37:38,950 --> 00:37:37,599
get it

984
00:37:41,109 --> 00:37:38,960
and that landing location is

985
00:37:44,069 --> 00:37:41,119
approximately 50 to 60 nautical miles

986
00:37:46,069 --> 00:37:44,079
off the coast of california

987
00:37:48,230 --> 00:37:46,079
during the final hours of the mission

988
00:37:50,150 --> 00:37:48,240

what we do to prepare

989
00:37:51,910 --> 00:37:50,160
while the capsule is getting ready to

990
00:37:54,150 --> 00:37:51,920
come back through entry

991
00:37:55,589 --> 00:37:54,160
is um we deploy some helicopters off of

992
00:37:57,510 --> 00:37:55,599
the flight deck of the ship we talked

993
00:38:00,150 --> 00:37:57,520
about that in some divers so if we can

994
00:38:01,670 --> 00:38:00,160
pull up the first slide um

995
00:38:03,349 --> 00:38:01,680
we'll have a picture of the divers

996
00:38:05,190 --> 00:38:03,359
interacting with the capsule but

997
00:38:06,950 --> 00:38:05,200
basically those folks need to be in the

998
00:38:09,510 --> 00:38:06,960
open water and the air because we're

999
00:38:11,670 --> 00:38:09,520
trying to get as much data collected as

1000
00:38:13,430 --> 00:38:11,680
we can upon entry so we want to see the

1001
00:38:15,270 --> 00:38:13,440
parachutes we want to take imagery we

1002
00:38:17,829 --> 00:38:15,280
need temperatures

1003
00:38:19,190 --> 00:38:17,839
how is the tps performing and so it's

1004
00:38:20,550 --> 00:38:19,200
very important that we already are

1005
00:38:22,790 --> 00:38:20,560
deployed so that we can get that

1006
00:38:24,950 --> 00:38:22,800
information as quickly as possible

1007
00:38:26,470 --> 00:38:24,960
and then the deployed team of divers is

1008
00:38:27,990 --> 00:38:26,480
pictured on your screen the very first

1009
00:38:29,589 --> 00:38:28,000
task that they will have is trying to

1010
00:38:31,190 --> 00:38:29,599
get to the jettison hardware that was

1011
00:38:33,270 --> 00:38:31,200
mentioned before it syncs there's a

1012
00:38:34,790 --> 00:38:33,280
forward bay cover that comes off of the

1013
00:38:37,030 --> 00:38:34,800

top of the capsule judd talked about

1014
00:38:39,430 --> 00:38:37,040
that earlier and three main parachutes

1015
00:38:41,589 --> 00:38:39,440
those are the top priorities we have for

1016
00:38:43,190 --> 00:38:41,599
getting back as quickly as possible

1017
00:38:45,190 --> 00:38:43,200
that hardware now of course if we can

1018
00:38:47,430 --> 00:38:45,200
get back drug shoots or any of the other

1019
00:38:49,910 --> 00:38:47,440
parachutes we will absolutely try to do

1020
00:38:51,670 --> 00:38:49,920
that but those are our priorities and

1021
00:38:53,430 --> 00:38:51,680
while that's happening there will be

1022
00:38:55,829 --> 00:38:53,440
some tests happening on the rhine

1023
00:38:57,829 --> 00:38:55,839
vehicle that were mentioned for cooling

1024
00:39:00,230 --> 00:38:57,839
and and other things so we let that that

1025
00:39:03,430 --> 00:39:00,240
capsule sit powered up for a while while

1026
00:39:06,310 --> 00:39:03,440
we're focusing on jettison hardware

1027
00:39:08,470 --> 00:39:06,320
and so you can see once we're ready to

1028
00:39:09,990 --> 00:39:08,480
recover the capsule the divers will

1029
00:39:11,270 --> 00:39:10,000
approach the capsule which is in the

1030
00:39:12,950 --> 00:39:11,280
picture that you're looking at they will

1031
00:39:15,430 --> 00:39:12,960
attach something called a pony collar

1032
00:39:17,750 --> 00:39:15,440
which is that that colorful black and

1033
00:39:20,230 --> 00:39:17,760
yellow and red and orange color around

1034
00:39:21,750 --> 00:39:20,240
it and that allows us to attach lines to

1035
00:39:24,230 --> 00:39:21,760
the capsule so that we can tow the

1036
00:39:25,510 --> 00:39:24,240
capsule into the back of the ship into

1037
00:39:28,550 --> 00:39:25,520
what's called the well deck so if you

1038
00:39:30,150 --> 00:39:28,560

want to go to the next picture

1039
00:39:33,750 --> 00:39:30,160
you can see that all of the lines are

1040
00:39:35,349 --> 00:39:33,760
attached and we now have a ship that

1041
00:39:36,390 --> 00:39:35,359
the picture is actually being taken from

1042
00:39:38,310 --> 00:39:36,400
a rib

1043
00:39:40,710 --> 00:39:38,320
which is a rein

1044
00:39:41,670 --> 00:39:40,720
a rigid whole inflatable boat where the

1045
00:39:44,710 --> 00:39:41,680
the

1046
00:39:46,950 --> 00:39:44,720
back

1047
00:39:49,750 --> 00:39:46,960
and there are lines being attached to

1048
00:39:51,829 --> 00:39:49,760
the front from the ship and then we will

1049
00:39:53,510 --> 00:39:51,839
tow that capsule into the well deck

1050
00:39:56,310 --> 00:39:53,520
where we will

1051
00:39:57,829 --> 00:39:56,320
hold it steady while the navy drains the

1052
00:39:59,510 --> 00:39:57,839
well deck if you want to go to the final

1053
00:40:00,790 --> 00:39:59,520
picture you can see a copy of what it

1054
00:40:04,230 --> 00:40:00,800
looks like inside a picture of what it

1055
00:40:08,390 --> 00:40:06,230
and you can see there's a lot of water

1056
00:40:10,150 --> 00:40:08,400
in the well deck we flood it they the

1057
00:40:11,589 --> 00:40:10,160
navy floods it they drop the stern gate

1058
00:40:13,829 --> 00:40:11,599
pump a bunch of water in there that

1059
00:40:15,910 --> 00:40:13,839
allows us to pull the capsule in and

1060
00:40:17,670 --> 00:40:15,920
then in the front corner of the screen

1061
00:40:19,750 --> 00:40:17,680
you can see the yellow there that's um

1062
00:40:21,430 --> 00:40:19,760
underwater but that's the orion recovery

1063
00:40:23,109 --> 00:40:21,440

cradle assembly

1064
00:40:25,430 --> 00:40:23,119
and we will

1065
00:40:27,270 --> 00:40:25,440
hold the capsule steady with those lines

1066
00:40:29,990 --> 00:40:27,280
while the navy pumps all the water out

1067
00:40:31,910 --> 00:40:30,000
of the well deck and softly land the

1068
00:40:32,950 --> 00:40:31,920
capsule in that

1069
00:40:33,910 --> 00:40:32,960
cradle

1070
00:40:35,270 --> 00:40:33,920
this

1071
00:40:37,510 --> 00:40:35,280
whole

1072
00:40:39,510 --> 00:40:37,520
timeline will be probably four to five

1073
00:40:41,910 --> 00:40:39,520
hours long which is a lot longer than it

1074
00:40:43,750 --> 00:40:41,920
will be for crew but this objective for

1075
00:40:45,510 --> 00:40:43,760
this first mission is data collection

1076
00:40:47,990 --> 00:40:45,520
and engineering data that will allow us

1077
00:40:50,309 --> 00:40:48,000
to fly crew and artemis ii and so we are

1078
00:40:51,990 --> 00:40:50,319
very careful with all the tps the heat

1079
00:40:53,589 --> 00:40:52,000
shield all of the things that the orion

1080
00:40:55,829 --> 00:40:53,599
program needs to do to look at this

1081
00:40:57,589 --> 00:40:55,839
capsule to say yes we think we can fly

1082
00:40:59,109 --> 00:40:57,599
crew on the next one

1083
00:41:01,109 --> 00:40:59,119
um i think that's probably enough data

1084
00:41:02,470 --> 00:41:01,119
for now or i'm sure we'll get into some

1085
00:41:03,990 --> 00:41:02,480
more details during the question and

1086
00:41:05,910 --> 00:41:04,000
answer period i'm going to hand it back

1087
00:41:07,510 --> 00:41:05,920
over to houston at this time all right

1088
00:41:09,990 --> 00:41:07,520

thank you very much melissa now you're

1089
00:41:12,069 --> 00:41:10,000
seeing an and the artemis one mission

1090
00:41:13,589 --> 00:41:12,079
from end to end it's testing the orion

1091
00:41:15,510 --> 00:41:13,599
spacecraft that will eventually carry

1092
00:41:18,710 --> 00:41:15,520
humans to and from the moon and those

1093
00:41:20,470 --> 00:41:18,720
humans are uh training as we speak so uh

1094
00:41:22,870 --> 00:41:20,480
we'll to talk about the humans that will

1095
00:41:25,430 --> 00:41:22,880
make that journey let's go over to reid

1096
00:41:26,790 --> 00:41:25,440
wiseman hey thanks gary uh thanks

1097
00:41:28,790 --> 00:41:26,800
everybody like this is unbelievably

1098
00:41:31,750 --> 00:41:28,800
exciting to look at the artemis one

1099
00:41:34,069 --> 00:41:31,760
mission in so much detail um obviously

1100
00:41:36,950 --> 00:41:34,079
we don't have crew on the first flight

1101
00:41:39,750 --> 00:41:36,960
but we have 42 active astronauts here at

1102
00:41:41,030 --> 00:41:39,760
houston 10 astronaut candidates and

1103
00:41:44,069 --> 00:41:41,040
we'll be beaten down the door for

1104
00:41:45,829 --> 00:41:44,079
artemis 2 and beyond

1105
00:41:47,670 --> 00:41:45,839
when we think about artemis we focus a

1106
00:41:48,950 --> 00:41:47,680
lot on the moon but i just want

1107
00:41:51,270 --> 00:41:48,960
everybody in the room and everybody

1108
00:41:53,190 --> 00:41:51,280
watching to remember our sights are not

1109
00:41:54,710 --> 00:41:53,200
set on the moon our sights are set

1110
00:41:55,910 --> 00:41:54,720
clearly on mars

1111
00:41:57,109 --> 00:41:55,920
and everything that you're thinking

1112
00:41:59,190 --> 00:41:57,119
about today everything that we're going

1113
00:42:01,109 --> 00:41:59,200

to do in artemis 1 artemis 1 leads to

1114
00:42:02,550 --> 00:42:01,119
artemis 2 which leads to artemis 3 when

1115
00:42:03,430 --> 00:42:02,560
we hope to have humans on the surface of

1116
00:42:05,510 --> 00:42:03,440
the moon

1117
00:42:07,750 --> 00:42:05,520
but artemis iii is leading to the rest

1118
00:42:09,430 --> 00:42:07,760
of the artemis program

1119
00:42:11,030 --> 00:42:09,440
the first woman the first person of

1120
00:42:13,109 --> 00:42:11,040
color on the surface of the moon and

1121
00:42:14,950 --> 00:42:13,119
then the first humans tracking out to

1122
00:42:16,550 --> 00:42:14,960
mars and putting our footsteps in

1123
00:42:17,910 --> 00:42:16,560
building science laboratories and

1124
00:42:20,230 --> 00:42:17,920
inhabiting another

1125
00:42:22,470 --> 00:42:20,240
another planet to me it's just

1126
00:42:24,069 --> 00:42:22,480
the most awe-inspiring moment that we

1127
00:42:25,750 --> 00:42:24,079
have had here at nasa and i love working

1128
00:42:28,630 --> 00:42:25,760
here right now it's an honor to get to

1129
00:42:30,710 --> 00:42:28,640
do so so what are our 42 active intent

1130
00:42:32,390 --> 00:42:30,720
astronaut candidates doing right now

1131
00:42:35,430 --> 00:42:32,400
to prepare for all of this i have just a

1132
00:42:37,990 --> 00:42:35,440
few very quick slides uh far less detail

1133
00:42:39,430 --> 00:42:38,000
than uh than my nasa counterparts here

1134
00:42:40,550 --> 00:42:39,440
my and my european friends there

1135
00:42:42,710 --> 00:42:40,560
philippe

1136
00:42:44,390 --> 00:42:42,720
but in order to land on the moon in

1137
00:42:46,309 --> 00:42:44,400
order to land on mars

1138
00:42:47,510 --> 00:42:46,319

uh we're gonna come down pretty much

1139
00:42:49,990 --> 00:42:47,520
vertically

1140
00:42:51,589 --> 00:42:50,000
um whether it's spacex option a building

1141
00:42:53,750 --> 00:42:51,599
their human lander for for the moon that

1142
00:42:54,950 --> 00:42:53,760
we will fly or our other contractors

1143
00:42:56,470 --> 00:42:54,960
that are coming online to take

1144
00:42:57,670 --> 00:42:56,480
subsequent missions we're almost

1145
00:42:59,430 --> 00:42:57,680
certainly going to come down vertically

1146
00:43:01,990 --> 00:42:59,440
so we're spending a little time right

1147
00:43:04,870 --> 00:43:02,000
now with the army just to get familiar

1148
00:43:06,390 --> 00:43:04,880
with landing vertically landing in snow

1149
00:43:08,230 --> 00:43:06,400
what does it look like to be whited out

1150
00:43:10,390 --> 00:43:08,240
like you would be on the surface of mars

1151
00:43:12,470 --> 00:43:10,400
or on the surface of the moon

1152
00:43:15,349 --> 00:43:12,480
and just a few hours in helicopters but

1153
00:43:18,069 --> 00:43:15,359
it is amazing how much you learn how

1154
00:43:19,670 --> 00:43:18,079
quickly you learn and we are doing that

1155
00:43:21,990 --> 00:43:19,680
not so that we're good at landing

1156
00:43:23,190 --> 00:43:22,000
vertically but so we understand the new

1157
00:43:25,349 --> 00:43:23,200
and different risks when you don't have

1158
00:43:27,109 --> 00:43:25,359
a runway that you're landing on

1159
00:43:29,109 --> 00:43:27,119
and you learn a lot very quickly next

1160
00:43:30,390 --> 00:43:29,119
slide

1161
00:43:31,270 --> 00:43:30,400
uh

1162
00:43:33,510 --> 00:43:31,280
we

1163
00:43:35,510 --> 00:43:33,520

have been working off the planet for

1164
00:43:37,109 --> 00:43:35,520
quite a while on this little tiny thing

1165
00:43:38,790 --> 00:43:37,119
called the international space station

1166
00:43:41,349 --> 00:43:38,800
there's a great picture of raja who just

1167
00:43:43,510 --> 00:43:41,359
came home on spacex crew 3.

1168
00:43:45,510 --> 00:43:43,520
he was the commander of that vehicle

1169
00:43:47,829 --> 00:43:45,520
our crew is up there right now

1170
00:43:49,990 --> 00:43:47,839
crew 4 with chell and his crew and and

1171
00:43:52,069 --> 00:43:50,000
they're conducting science

1172
00:43:53,750 --> 00:43:52,079
day and night 24 7.

1173
00:43:55,829 --> 00:43:53,760
365 days a year we've been doing this

1174
00:43:57,270 --> 00:43:55,839
since the year 2000 and and every day

1175
00:43:59,510 --> 00:43:57,280
that i personally spent on the space

1176
00:44:01,430 --> 00:43:59,520
station i looked at it as

1177
00:44:03,030 --> 00:44:01,440
walking on mars that is why we're up

1178
00:44:04,790 --> 00:44:03,040
there we're trying to make life better

1179
00:44:06,870 --> 00:44:04,800
on earth and we're trying to expand

1180
00:44:09,430 --> 00:44:06,880
humanity into our solar system

1181
00:44:12,390 --> 00:44:09,440
next slide

1182
00:44:15,030 --> 00:44:12,400
uh this this makes me jealous uh one of

1183
00:44:17,589 --> 00:44:15,040
my one of my classmates kate rubins is

1184
00:44:19,109 --> 00:44:17,599
somewhere in that photo uh two-time

1185
00:44:21,349 --> 00:44:19,119
flyer to the space station uh

1186
00:44:23,910 --> 00:44:21,359
microbiologist and and we have her out

1187
00:44:25,990 --> 00:44:23,920
in a in a european training session just

1188
00:44:28,069 --> 00:44:26,000

a few months ago called pangaea where

1189
00:44:31,030 --> 00:44:28,079
we're going out and looking at all lunar

1190
00:44:32,069 --> 00:44:31,040
geology how we would sample rocks how we

1191
00:44:34,950 --> 00:44:32,079
would get

1192
00:44:37,270 --> 00:44:34,960
lunar samples retain them catalog them

1193
00:44:38,710 --> 00:44:37,280
for the scientists on earth uh what we

1194
00:44:40,950 --> 00:44:38,720
need to think about it's a totally

1195
00:44:42,150 --> 00:44:40,960
different way of thinking in a geologic

1196
00:44:44,230 --> 00:44:42,160
time scale

1197
00:44:45,750 --> 00:44:44,240
um and and just thinking the way a

1198
00:44:47,510 --> 00:44:45,760
geologist would think on the surface of

1199
00:44:49,510 --> 00:44:47,520
the moon and onward to mars so we're

1200
00:44:51,190 --> 00:44:49,520
doing that training we also train a lot

1201
00:44:53,190 --> 00:44:51,200
in iceland

1202
00:44:56,550 --> 00:44:53,200
it is a very good analog to the lunar

1203
00:44:59,910 --> 00:44:58,069
some of you this afternoon will go over

1204
00:45:02,069 --> 00:44:59,920
to our virtual reality

1205
00:45:05,990 --> 00:45:02,079
laboratory and virtual reality is just

1206
00:45:08,470 --> 00:45:06,000
paying enormous dividends right now so

1207
00:45:10,390 --> 00:45:08,480
we expect the the next human landing on

1208
00:45:11,589 --> 00:45:10,400
the moon to be at the south pole

1209
00:45:14,630 --> 00:45:11,599
and if you've ever looked out at the

1210
00:45:17,430 --> 00:45:14,640
moon at night the south pole has got a

1211
00:45:18,790 --> 00:45:17,440
very weird very weird sun angle very

1212
00:45:20,710 --> 00:45:18,800
weird light that hits it there's

1213
00:45:22,309 --> 00:45:20,720

permanently shaded regions

1214
00:45:23,829 --> 00:45:22,319
and we have developed hopefully you'll

1215
00:45:25,829 --> 00:45:23,839
see this afternoon we've developed in

1216
00:45:27,430 --> 00:45:25,839
the in the virtual reality world what it

1217
00:45:29,829 --> 00:45:27,440
actually looks like with the exact sun

1218
00:45:32,230 --> 00:45:29,839
angle that we'll be landing at and it is

1219
00:45:34,069 --> 00:45:32,240
crazy weird the bottom half of you can

1220
00:45:36,550 --> 00:45:34,079
be an absolute blackness and the top

1221
00:45:38,390 --> 00:45:36,560
half of you can be in blinding sunlight

1222
00:45:39,990 --> 00:45:38,400
uh the way shadows are projected across

1223
00:45:42,150 --> 00:45:40,000
the lunar surface it just changes

1224
00:45:43,990 --> 00:45:42,160
literally everything so in this virtual

1225
00:45:45,910 --> 00:45:44,000
reality world we can go in there for 10

1226
00:45:48,630 --> 00:45:45,920
minutes and you can answer a thousand

1227
00:45:51,270 --> 00:45:48,640
questions you can stop 200 meetings with

1228
00:45:52,870 --> 00:45:51,280
10 minutes of vr goggles and so it's uh

1229
00:45:55,670 --> 00:45:52,880
it's really a great facility i think

1230
00:45:59,910 --> 00:45:58,230
all right next slide

1231
00:46:01,990 --> 00:45:59,920
we also over in building five here at

1232
00:46:04,950 --> 00:46:02,000
the johnson space center we have the

1233
00:46:07,750 --> 00:46:04,960
orion uh crew trainer uh there you have

1234
00:46:09,829 --> 00:46:07,760
uh stephanie johnny and randy bresnik

1235
00:46:12,150 --> 00:46:09,839
who have been heavily involved in the

1236
00:46:13,910 --> 00:46:12,160
development of orion the last few years

1237
00:46:15,670 --> 00:46:13,920
uh what it'll feel like to fly and that

1238
00:46:17,589 --> 00:46:15,680

trainer is being outfitted right now

1239
00:46:18,870 --> 00:46:17,599
we'll be ready later this year to start

1240
00:46:20,870 --> 00:46:18,880
our crew training

1241
00:46:22,950 --> 00:46:20,880
next slide

1242
00:46:24,150 --> 00:46:22,960
and uh the final slide in this i think

1243
00:46:26,069 --> 00:46:24,160
some of you were out this morning at our

1244
00:46:27,109 --> 00:46:26,079
neutral buoyancy laboratory about 10

1245
00:46:30,150 --> 00:46:27,119
minutes

1246
00:46:32,069 --> 00:46:30,160
north of the johnson space center

1247
00:46:33,990 --> 00:46:32,079
very large pool where we have been

1248
00:46:36,150 --> 00:46:34,000
training for international space station

1249
00:46:37,670 --> 00:46:36,160
spacewalks for two decades and now we're

1250
00:46:39,270 --> 00:46:37,680
taking a portion of that pool and

1251
00:46:40,470 --> 00:46:39,280
looking at what it would look like to be

1252
00:46:43,910 --> 00:46:40,480
on the moon

1253
00:46:45,510 --> 00:46:43,920
to spend six hours in a lunar class

1254
00:46:47,750 --> 00:46:45,520
spacesuit

1255
00:46:50,069 --> 00:46:47,760
doing research on the bottom of a pool

1256
00:46:52,710 --> 00:46:50,079
and it's it's an amazingly fantastic

1257
00:46:54,309 --> 00:46:52,720
facility um to be underwater to spend

1258
00:46:55,670 --> 00:46:54,319
that much time thinking about how it

1259
00:46:58,150 --> 00:46:55,680
will be to be on the moon so we'll be

1260
00:46:59,030 --> 00:46:58,160
using that as we move forward

1261
00:47:00,309 --> 00:46:59,040
um

1262
00:47:01,750 --> 00:47:00,319
and that's that's the end of my

1263
00:47:03,349 --> 00:47:01,760

powerpoint pitch the question that

1264
00:47:05,589 --> 00:47:03,359
everyone will ask is when are we

1265
00:47:08,390 --> 00:47:05,599
assigning a crew to artemis 2

1266
00:47:09,349 --> 00:47:08,400
and uh we hope that'll be later

1267
00:47:10,710 --> 00:47:09,359
this year

1268
00:47:12,470 --> 00:47:10,720
thank you

1269
00:47:14,950 --> 00:47:12,480
very good all right thanks to all of our

1270
00:47:17,109 --> 00:47:14,960
briefers for the very detailed overview

1271
00:47:18,790 --> 00:47:17,119
of the artemis one mission and and what

1272
00:47:21,670 --> 00:47:18,800
we are doing for the future to build

1273
00:47:23,910 --> 00:47:21,680
upon uh uh artemis and going to the moon

1274
00:47:26,309 --> 00:47:23,920
and to mars so we're extending our time

1275
00:47:28,630 --> 00:47:26,319
for the um for the briefings to give us

1276
00:47:30,309 --> 00:47:28,640
about 45 minutes for questions

1277
00:47:31,910 --> 00:47:30,319
so we'll we'll spend some time taking

1278
00:47:34,069 --> 00:47:31,920
some questions here in the room and then

1279
00:47:36,150 --> 00:47:34,079
of course on our phone bridge

1280
00:47:37,349 --> 00:47:36,160
so a review of how we're going to take

1281
00:47:39,190 --> 00:47:37,359
the questions

1282
00:47:40,309 --> 00:47:39,200
raise your hand nice and high so we can

1283
00:47:41,990 --> 00:47:40,319
see you and then we're going to run a

1284
00:47:43,270 --> 00:47:42,000
microphone over to you and then you can

1285
00:47:45,109 --> 00:47:43,280
ask your question with the microphone

1286
00:47:46,549 --> 00:47:45,119
we'll start over on this side uh and

1287
00:47:48,150 --> 00:47:46,559
then please state uh once you have the

1288
00:47:50,230 --> 00:47:48,160

microphone state your name your

1289
00:47:51,510 --> 00:47:50,240
affiliation and to whom you'd like to

1290
00:47:54,470 --> 00:47:51,520
direct your question we have folks from

1291
00:47:55,750 --> 00:47:54,480
all over uh so just make sure you

1292
00:47:56,790 --> 00:47:55,760
state to who you'd like to direct your

1293
00:47:58,470 --> 00:47:56,800
question

1294
00:48:00,870 --> 00:47:58,480
um if you're on the phone bridge please

1295
00:48:02,390 --> 00:48:00,880
press star one uh to submit your name

1296
00:48:03,430 --> 00:48:02,400
into the queue and then once your name

1297
00:48:05,349 --> 00:48:03,440
is called

1298
00:48:07,109 --> 00:48:05,359
you can direct direct a question to

1299
00:48:08,390 --> 00:48:07,119
anyone here on the panel if you find

1300
00:48:10,309 --> 00:48:08,400
that your question has already been

1301
00:48:13,109 --> 00:48:10,319
answered you can withdraw it at any time

1302
00:48:14,790 --> 00:48:13,119
by pressing star 2. uh so with that

1303
00:48:16,710 --> 00:48:14,800
let's start here in the room on this

1304
00:48:19,030 --> 00:48:16,720
side please go ahead yeah we can start

1305
00:48:20,390 --> 00:48:19,040
state your name affiliation and to whom

1306
00:48:22,950 --> 00:48:20,400
you'd like to direct your question uh

1307
00:48:25,030 --> 00:48:22,960
chris gephardt with nsf uh i believe

1308
00:48:27,589 --> 00:48:25,040
they're for judd um

1309
00:48:29,670 --> 00:48:27,599
in terms of ascent um with the launch

1310
00:48:31,670 --> 00:48:29,680
port system not having its support

1311
00:48:33,270 --> 00:48:31,680
motors installed what abort options are

1312
00:48:35,589 --> 00:48:33,280
available for orion and when do they

1313
00:48:37,270 --> 00:48:35,599

become available in the ascent profile

1314
00:48:38,950 --> 00:48:37,280
and on the flip side of that for landing

1315
00:48:41,349 --> 00:48:38,960
uh when you're coming into san diego

1316
00:48:43,109 --> 00:48:41,359
what if the weather isn't good at the

1317
00:48:45,030 --> 00:48:43,119
landing site on october 10th what are

1318
00:48:47,030 --> 00:48:45,040
your options to target a different one

1319
00:48:48,549 --> 00:48:47,040
what are the backup landing options for

1320
00:48:49,510 --> 00:48:48,559
for the 10th that's a great question

1321
00:48:52,470 --> 00:48:49,520
chris

1322
00:48:55,030 --> 00:48:52,480
so uh our abort options become available

1323
00:48:56,390 --> 00:48:55,040
after the last jettisons uh about that

1324
00:48:58,230 --> 00:48:56,400
three and a half hour three and a half

1325
00:49:00,309 --> 00:48:58,240
minute mark

1326
00:49:02,790 --> 00:49:00,319
our first uh abort mode that we have

1327
00:49:05,190 --> 00:49:02,800
available to us is untargeted splash

1328
00:49:07,270 --> 00:49:05,200
so that would be where we'd separate and

1329
00:49:08,950 --> 00:49:07,280
uh and splash down somewhere in the

1330
00:49:11,109 --> 00:49:08,960
atlantic ocean

1331
00:49:14,069 --> 00:49:11,119
we also have an overlap between that

1332
00:49:16,950 --> 00:49:14,079
untargeted abort splash mode and then an

1333
00:49:18,630 --> 00:49:16,960
abort once around uh option uh that's

1334
00:49:20,150 --> 00:49:18,640
about seven and a half minutes or so

1335
00:49:22,790 --> 00:49:20,160
into the flight where we have that uh

1336
00:49:24,790 --> 00:49:22,800
that uh uh overlap and the abort once

1337
00:49:26,790 --> 00:49:24,800
around would take the uh the the the

1338
00:49:30,309 --> 00:49:26,800

capsule and put us off the coast of

1339
00:49:32,790 --> 00:49:30,319
california uh in the pacific

1340
00:49:34,470 --> 00:49:32,800
additionally we have um once the solar

1341
00:49:35,829 --> 00:49:34,480
rays are deployed

1342
00:49:38,630 --> 00:49:35,839
after about that

1343
00:49:41,190 --> 00:49:38,640
you know 18 plus 12 minute mark

1344
00:49:43,430 --> 00:49:41,200
we have available to us should something

1345
00:49:45,349 --> 00:49:43,440
go wrong with the upper stage we have

1346
00:49:47,190 --> 00:49:45,359
the availab

1347
00:49:49,030 --> 00:49:47,200
option to abort to orbit so we'll we'll

1348
00:49:51,349 --> 00:49:49,040
do an orbit obviously we wouldn't be

1349
00:49:53,670 --> 00:49:51,359
going in the moon in that fact

1350
00:49:56,549 --> 00:49:53,680
as far as your question on entry uh what

1351
00:49:58,870 --> 00:49:56,559
what options do we have for abort

1352
00:50:02,309 --> 00:49:58,880
landing for weather

1353
00:50:04,069 --> 00:50:02,319
once we do our deorbit burn back at rpf

1354
00:50:06,150 --> 00:50:04,079
return power flyby

1355
00:50:07,349 --> 00:50:06,160
our trajectory along the earth's surface

1356
00:50:08,950 --> 00:50:07,359
is fixed

1357
00:50:11,270 --> 00:50:08,960
so the only things that we can do to

1358
00:50:13,190 --> 00:50:11,280
modulate is to land a little longer than

1359
00:50:15,910 --> 00:50:13,200
we intended or landed land shorter than

1360
00:50:19,270 --> 00:50:15,920
we intended so up ranger downrange

1361
00:50:22,630 --> 00:50:19,280
and and so we have uh several sites

1362
00:50:24,549 --> 00:50:22,640
within 1200 1200 nautical miles of san

1363
00:50:27,670 --> 00:50:24,559

diego that we'll be looking at

1364
00:50:29,750 --> 00:50:27,680
to make sure we can and and we're 90

1365
00:50:31,190 --> 00:50:29,760
confident that we'll be able to find one

1366
00:50:34,230 --> 00:50:31,200
that will feed off fit all the

1367
00:50:36,790 --> 00:50:34,240
conditions that we need uh splashdown um

1368
00:50:39,910 --> 00:50:36,800
melissa didn't mention this but uh

1369
00:50:41,990 --> 00:50:39,920
three days out before splashdown uh her

1370
00:50:45,270 --> 00:50:42,000
her recovery team is going to be halfway

1371
00:50:47,430 --> 00:50:45,280
between that 1200 nautical mile in in

1372
00:50:48,870 --> 00:50:47,440
san diego and so uh once we have a

1373
00:50:49,910 --> 00:50:48,880
better idea what the weather is going to

1374
00:50:51,829 --> 00:50:49,920
be like

1375
00:50:54,630 --> 00:50:51,839
we'll we'll either send send the

1376
00:50:56,470 --> 00:50:54,640
recovery forces inland or if if the the

1377
00:50:59,190 --> 00:50:56,480
weather's bad inland then we'll they'll

1378
00:51:02,069 --> 00:51:00,470
okay yeah

1379
00:51:05,510 --> 00:51:02,079
hi

1380
00:51:07,190 --> 00:51:05,520
is john moan i'm a correspondent for

1381
00:51:09,750 --> 00:51:07,200
newsie and again apologies for the

1382
00:51:12,309 --> 00:51:09,760
redundancy here once we get all the data

1383
00:51:14,309 --> 00:51:12,319
from this unmanned mission uh what's a

1384
00:51:19,829 --> 00:51:14,319
refined timeline for when human beings

1385
00:51:24,870 --> 00:51:23,270
you want to answer that yeah yeah so so

1386
00:51:26,630 --> 00:51:24,880
after artemis one you know the next step

1387
00:51:29,349 --> 00:51:26,640
will be artemis ii which is uh planned

1388
00:51:31,190 --> 00:51:29,359

for 2024 so that'll be our crude mission

1389
00:51:33,270 --> 00:51:31,200
we'll take all the data from this flight

1390
00:51:34,950 --> 00:51:33,280
um the artemis ii uh

1391
00:51:36,470 --> 00:51:34,960
you saw pictures of the european service

1392
00:51:38,309 --> 00:51:36,480
module for artemis has already been

1393
00:51:40,309 --> 00:51:38,319
delivered the crew module and the launch

1394
00:51:41,670 --> 00:51:40,319
of our systems are already well on their

1395
00:51:43,750 --> 00:51:41,680
own way of being fabricated down at

1396
00:51:44,790 --> 00:51:43,760
kennedy as well so we talked mostly

1397
00:51:47,349 --> 00:51:44,800
about our missed one today but those

1398
00:51:49,670 --> 00:51:47,359
vehicles are already rapidly being built

1399
00:51:52,309 --> 00:51:49,680
planned to hand those over to our um

1400
00:51:54,630 --> 00:51:52,319
ground support friends in in mid 2024

1401
00:51:56,630 --> 00:51:54,640
and launched by the end of 24 for crew

1402
00:51:58,150 --> 00:51:56,640
um as far as artemis three targets in

1403
00:52:00,470 --> 00:51:58,160
2025's we're trying to do annual

1404
00:52:01,829 --> 00:52:00,480
missions after that um it's kind of

1405
00:52:02,630 --> 00:52:01,839
outside the scope of this briefing

1406
00:52:04,150 --> 00:52:02,640
because there's a lot of other

1407
00:52:06,230 --> 00:52:04,160
components that have to feed into that

1408
00:52:07,829 --> 00:52:06,240
but in terms of the orion vehicle and

1409
00:52:11,670 --> 00:52:07,839
the launch system those are both

1410
00:52:16,710 --> 00:52:14,309
uh mark caro with aviation week in space

1411
00:52:20,630 --> 00:52:16,720
technology and my question is for rick

1412
00:52:23,750 --> 00:52:20,640
lebron how how will this mission

1413
00:52:26,470 --> 00:52:23,760

inform mission control and the team

1414
00:52:28,069 --> 00:52:26,480
uh to prepare for the crude flights

1415
00:52:29,430 --> 00:52:28,079
either

1416
00:52:30,230 --> 00:52:29,440
um

1417
00:52:33,829 --> 00:52:30,240
two

1418
00:52:36,150 --> 00:52:33,839
and three uh i guess what i'm saying is

1419
00:52:38,710 --> 00:52:36,160
what will you guys be focused on

1420
00:52:40,150 --> 00:52:38,720
um to make sure that you've got the

1421
00:52:42,309 --> 00:52:40,160
basis covered

1422
00:52:45,670 --> 00:52:42,319
for when you have a crew

1423
00:52:48,470 --> 00:52:45,680
yes good question excuse me um so right

1424
00:52:50,069 --> 00:52:48,480
now uh all the performance data that we

1425
00:52:52,630 --> 00:52:50,079
have with the vehicles really is test

1426
00:52:54,870 --> 00:52:52,640
data that debbie talked about we

1427
00:52:57,510 --> 00:52:54,880
supported the all those tests uh but

1428
00:52:58,950 --> 00:52:57,520
it's it's all either test data or or

1429
00:53:01,109 --> 00:52:58,960
models

1430
00:53:02,870 --> 00:53:01,119
theory and this mission is going to

1431
00:53:04,069 --> 00:53:02,880
inform all the models it's we're going

1432
00:53:06,630 --> 00:53:04,079
to see how the vehicle is going to

1433
00:53:09,030 --> 00:53:06,640
really really perform in the environment

1434
00:53:11,030 --> 00:53:09,040
that we're asking it to to perform in

1435
00:53:12,230 --> 00:53:11,040
and so all that information is is going

1436
00:53:13,750 --> 00:53:12,240
to be knowledge that we're going to gain

1437
00:53:16,230 --> 00:53:13,760
we're going to be updating all of our

1438
00:53:17,589 --> 00:53:16,240

procedures and our documentation to to

1439
00:53:23,670 --> 00:53:17,599
to

1440
00:53:25,589 --> 00:53:23,680
controllers for when we uh when it is

1441
00:53:28,549 --> 00:53:25,599
time to put the crew on or on on the

1442
00:53:30,790 --> 00:53:28,559
vehicle

1443
00:53:33,430 --> 00:53:30,800
irene klotz also with aviation week um

1444
00:53:35,990 --> 00:53:33,440
probably for judd um after the perigee

1445
00:53:38,630 --> 00:53:36,000
rays maneuver um how long

1446
00:53:41,349 --> 00:53:38,640
before the tli burn might there be to

1447
00:53:42,790 --> 00:53:41,359
have orion stay in earth orbit if

1448
00:53:44,790 --> 00:53:42,800
there's some issue

1449
00:53:47,670 --> 00:53:44,800
and also what's the battery life on

1450
00:53:49,990 --> 00:53:47,680
orion before the solar arrays

1451
00:53:52,390 --> 00:53:50,000
need to be deployed

1452
00:53:53,829 --> 00:53:52,400
great questions irene let's see so

1453
00:53:55,910 --> 00:53:53,839
first question on

1454
00:53:56,790 --> 00:53:55,920
perigee rays maneuver how long can orion

1455
00:53:59,349 --> 00:53:56,800
stay

1456
00:54:00,390 --> 00:53:59,359
on board orbit if if there was a

1457
00:54:01,829 --> 00:54:00,400
on board

1458
00:54:02,710 --> 00:54:01,839
if there's a problem

1459
00:54:03,829 --> 00:54:02,720
so

1460
00:54:04,710 --> 00:54:03,839
if there's a problem with the upper

1461
00:54:07,750 --> 00:54:04,720
stage

1462
00:54:10,230 --> 00:54:07,760
orion has still has the the

1463
00:54:12,790 --> 00:54:10,240

ohms engine available to it so we can we

1464
00:54:15,190 --> 00:54:12,800
can circularize we can raise its perigee

1465
00:54:17,270 --> 00:54:15,200
if we need to on its own so it we can

1466
00:54:20,309 --> 00:54:17,280
perform a a uh

1467
00:54:22,549 --> 00:54:20,319
an orbital insertion although uh in that

1468
00:54:25,510 --> 00:54:22,559
case we're likely not going to to the

1469
00:54:27,589 --> 00:54:25,520
moon that answer your question or no if

1470
00:54:29,109 --> 00:54:27,599
there's um

1471
00:54:32,069 --> 00:54:29,119
can you pass the mic down

1472
00:54:34,309 --> 00:54:32,079
i think if the upper stage is available

1473
00:54:36,710 --> 00:54:34,319
but some other issue comes up where

1474
00:54:41,270 --> 00:54:36,720
you're not burning according to your

1475
00:54:44,069 --> 00:54:41,280
nominal timeline is there an option to

1476
00:54:45,750 --> 00:54:44,079
delay the tli burn that's a great okay i

1477
00:54:47,990 --> 00:54:45,760
understand your question now uh no

1478
00:54:50,549 --> 00:54:48,000
there's no option so uh the the upper

1479
00:54:51,510 --> 00:54:50,559
stage is a pretty much a fire and forget

1480
00:54:52,870 --> 00:54:51,520
vehicle

1481
00:54:55,030 --> 00:54:52,880
so

1482
00:54:56,950 --> 00:54:55,040
if if it doesn't perform the perigee

1483
00:55:00,309 --> 00:54:56,960
rays maneuver or if it doesn't perform

1484
00:55:02,950 --> 00:55:00,319
the tli maneuver uh orion does not have

1485
00:55:05,430 --> 00:55:02,960
the the uh the commodities to get to the

1486
00:55:07,190 --> 00:55:05,440
moon by itself so it has to be uh put on

1487
00:55:09,430 --> 00:55:07,200
that tli

1488
00:55:11,190 --> 00:55:09,440

burn by the upper stage and and it has

1489
00:55:12,870 --> 00:55:11,200
to be at the times that that we

1490
00:55:14,950 --> 00:55:12,880
prescribed

1491
00:55:17,349 --> 00:55:14,960
your second question about the batteries

1492
00:55:19,589 --> 00:55:17,359
uh how long do the orion batteries last

1493
00:55:23,109 --> 00:55:19,599
before the solar rays they can last

1494
00:55:25,829 --> 00:55:23,119
about 45 to 50 minutes or a little bit

1495
00:55:27,589 --> 00:55:25,839
in that hour time range just enough to

1496
00:55:31,030 --> 00:55:27,599
to get to the abort once around should

1497
00:55:35,750 --> 00:55:33,270
hi robert pearlman with collect space

1498
00:55:36,630 --> 00:55:35,760
one for rick and one for reed

1499
00:55:38,390 --> 00:55:36,640
rick

1500
00:55:39,829 --> 00:55:38,400
is i'm realizing there's no crew on

1501
00:55:41,670 --> 00:55:39,839
board

1502
00:55:44,069 --> 00:55:41,680
how how is the flight team is going to

1503
00:55:45,750 --> 00:55:44,079
be referring to the vehicle when it's in

1504
00:55:47,510 --> 00:55:45,760
orbit over the loops is it does it have

1505
00:55:49,829 --> 00:55:47,520
a call sign

1506
00:55:51,430 --> 00:55:49,839
or is it orion artemis one

1507
00:55:53,190 --> 00:55:51,440
and for reed

1508
00:55:54,789 --> 00:55:53,200
are there members of the astronaut corps

1509
00:55:57,750 --> 00:55:54,799
who are assigned to specific technical

1510
00:55:59,670 --> 00:55:57,760
roles for artemis one supporting either

1511
00:56:03,670 --> 00:55:59,680
as a caped crusader or

1512
00:56:06,069 --> 00:56:03,680
on re-entry or in mission control

1513
00:56:09,430 --> 00:56:06,079

yeah mine's easy uh it is orion we'll

1514
00:56:11,829 --> 00:56:10,309
um

1515
00:56:13,750 --> 00:56:11,839
mine is more complicated many of these

1516
00:56:15,349 --> 00:56:13,760
people you know well stan love will be

1517
00:56:17,349 --> 00:56:15,359
working in mission control he'll be

1518
00:56:21,030 --> 00:56:17,359
following along as if we had a capsule

1519
00:56:22,630 --> 00:56:21,040
communicator on on uh on consoles so

1520
00:56:25,270 --> 00:56:22,640
stan will be looking for mission control

1521
00:56:27,750 --> 00:56:25,280
perspective uh randy breslick has been

1522
00:56:29,430 --> 00:56:27,760
following orion on our technical side

1523
00:56:30,549 --> 00:56:29,440
with the orion program for the last few

1524
00:56:32,950 --> 00:56:30,559
years so he'll be looking at the

1525
00:56:35,109 --> 00:56:32,960
technical aspects of the mission uh joe

1526
00:56:37,349 --> 00:56:35,119
acaba is our vet chief so he will be

1527
00:56:39,670 --> 00:56:37,359
down at kennedy space center looking at

1528
00:56:43,510 --> 00:56:39,680
all of our processes leading up to the

1529
00:56:45,270 --> 00:56:43,520
pad and then also on return and then i

1530
00:56:46,710 --> 00:56:45,280
will i will also be at kennedy for

1531
00:56:48,710 --> 00:56:46,720
launch looking at where will we be

1532
00:56:50,710 --> 00:56:48,720
putting family where will we be in

1533
00:56:52,470 --> 00:56:50,720
launch control the day the crew is on

1534
00:56:54,950 --> 00:56:52,480
board the vehicle and i'll be there with

1535
00:56:57,510 --> 00:56:54,960
our flight ops director norm knight as

1536
00:56:59,589 --> 00:56:57,520
we do that that's that's the small scale

1537
00:57:02,470 --> 00:56:59,599
but also understanding that this artemis

1538
00:57:04,549 --> 00:57:02,480

1 mission gets everybody fired up so

1539
00:57:05,510 --> 00:57:04,559
there is a large press element so you

1540
00:57:07,349 --> 00:57:05,520
will see

1541
00:57:10,069 --> 00:57:07,359
astronauts all over with the

1542
00:57:11,510 --> 00:57:10,079
administrator we'll be doing a lot of

1543
00:57:13,030 --> 00:57:11,520
interviews especially i know this

1544
00:57:15,190 --> 00:57:13,040
afternoon a lot of folks will be touring

1545
00:57:16,630 --> 00:57:15,200
you around uh as you're as you're going

1546
00:57:18,230 --> 00:57:16,640
through johnson space center so we'll be

1547
00:57:19,750 --> 00:57:18,240
all over the place but for the technical

1548
00:57:21,349 --> 00:57:19,760
roles those are really the folks we have

1549
00:57:24,390 --> 00:57:21,359
assigned

1550
00:57:25,829 --> 00:57:24,400
one quick follow-up uh so i said orion

1551
00:57:27,670 --> 00:57:25,839
which that's what we'll call it but you

1552
00:57:29,109 --> 00:57:27,680
know we do have this the crew module on

1553
00:57:31,270 --> 00:57:29,119
the service module a lot of the systems

1554
00:57:33,829 --> 00:57:31,280
are like there's a prop system on both

1555
00:57:35,750 --> 00:57:33,839
both modules so we would then refer to

1556
00:57:39,109 --> 00:57:35,760
it at the crew module or service module

1557
00:57:43,670 --> 00:57:41,109
uh thank you uh tarek malik with

1558
00:57:45,750 --> 00:57:43,680
space.com i believe uh one for read and

1559
00:57:47,190 --> 00:57:45,760
maybe one from melissa reid with some

1560
00:57:49,349 --> 00:57:47,200
systems like the waste management et

1561
00:57:51,990 --> 00:57:49,359
cetera not flying on orion i'm really

1562
00:57:53,910 --> 00:57:52,000
curious what uh the experience you're

1563
00:57:55,750 --> 00:57:53,920

looking for for the astronaut corps to

1564
00:57:58,150 --> 00:57:55,760
get from the sensors that are going to

1565
00:57:59,910 --> 00:57:58,160
be on board the mannequins et cetera

1566
00:58:00,870 --> 00:57:59,920
in this spacecraft how german and how

1567
00:58:02,390 --> 00:58:00,880
accurate

1568
00:58:04,150 --> 00:58:02,400
can you get a picture of what that

1569
00:58:06,950 --> 00:58:04,160
experience is going to be like and for

1570
00:58:08,950 --> 00:58:06,960
melissa on a recovery uh with a an

1571
00:58:10,870 --> 00:58:08,960
extended retrieval time for the testing

1572
00:58:12,150 --> 00:58:10,880
what's the target recovery for an actual

1573
00:58:14,549 --> 00:58:12,160
crew that you're going to want to aim

1574
00:58:18,069 --> 00:58:14,559
for thanks

1575
00:58:19,829 --> 00:58:18,079
from the crew on board standpoint um

1576
00:58:21,589 --> 00:58:19,839
i got i got to be honest the thing i'm

1577
00:58:23,190 --> 00:58:21,599
most looking for is how does this

1578
00:58:26,069 --> 00:58:23,200
integrated system work how's the core

1579
00:58:28,309 --> 00:58:26,079
stage vehicle dynamics work on ascent i

1580
00:58:30,069 --> 00:58:28,319
know that will all be good how does the

1581
00:58:31,510 --> 00:58:30,079
ablative block heat shield architecture

1582
00:58:33,030 --> 00:58:31,520
work on re-entry

1583
00:58:35,190 --> 00:58:33,040
that is something we'll be watching for

1584
00:58:36,789 --> 00:58:35,200
the ride inside we've been working on

1585
00:58:39,030 --> 00:58:36,799
this vehicle for years

1586
00:58:40,710 --> 00:58:39,040
we've been doing egress training

1587
00:58:42,390 --> 00:58:40,720
we've been looking at the the waste

1588
00:58:44,549 --> 00:58:42,400

facility the exercise facilities for

1589
00:58:46,870 --> 00:58:44,559
years that is not what we're looking to

1590
00:58:49,430 --> 00:58:46,880
get out of artemis one this is a robust

1591
00:58:50,870 --> 00:58:49,440
vehicle it's built to go to deep space

1592
00:58:52,150 --> 00:58:50,880
it's going to be ready for crew when we

1593
00:58:54,230 --> 00:58:52,160
are when we're ready to fly there on

1594
00:58:56,230 --> 00:58:54,240
armistic for sure

1595
00:58:58,069 --> 00:58:56,240
yeah i might add you know on artemis one

1596
00:59:00,390 --> 00:58:58,079
we are flying like i said some some

1597
00:59:01,750 --> 00:59:00,400
payloads that will help um inform our

1598
00:59:04,150 --> 00:59:01,760
models and make sure that the design

1599
00:59:05,829 --> 00:59:04,160
that we have predicted is actually

1600
00:59:07,030 --> 00:59:05,839
realized during the flight so you know

1601
00:59:09,510 --> 00:59:07,040
the kinds of environments worry about

1602
00:59:10,549 --> 00:59:09,520
radiation vibration accelerations all

1603
00:59:13,589 --> 00:59:10,559
those things we're measuring in the

1604
00:59:15,510 --> 00:59:13,599
vehicle the heat shield has hundreds of

1605
00:59:17,430 --> 00:59:15,520
sensors embedded in this ab code block

1606
00:59:19,510 --> 00:59:17,440
so we'll be collecting the actual

1607
00:59:20,710 --> 00:59:19,520
temperatures at actual locations

1608
00:59:22,150 --> 00:59:20,720
different depths

1609
00:59:24,150 --> 00:59:22,160
different locations

1610
00:59:25,430 --> 00:59:24,160
same thing with the the landing loads

1611
00:59:27,109 --> 00:59:25,440
we've got sensors that are picking that

1612
00:59:29,270 --> 00:59:27,119
up so so really i think you know in

1613
00:59:31,670 --> 00:59:29,280

terms of crew protection and crew

1614
00:59:33,670 --> 00:59:31,680
occupancy it's it's really about

1615
00:59:35,750 --> 00:59:33,680
validating the design so that we're

1616
00:59:38,549 --> 00:59:35,760
ready these other systems like waste

1617
00:59:40,630 --> 00:59:38,559
management galleys exercise we do have a

1618
00:59:42,069 --> 00:59:40,640
lot of those uh capabilities to test on

1619
00:59:44,150 --> 00:59:42,079
the ground we have crew over all the

1620
00:59:45,270 --> 00:59:44,160
time testing out those facilities

1621
00:59:46,789 --> 00:59:45,280
if you're going to building nine later

1622
00:59:48,630 --> 00:59:46,799
today you'll see the mock-up and there's

1623
00:59:51,109 --> 00:59:48,640
uh all of those those capabilities in

1624
00:59:52,710 --> 00:59:51,119
there um as well as um the vehicle that

1625
00:59:54,230 --> 00:59:52,720
we're building up now for artemis who

1626
00:59:56,309 --> 00:59:54,240
already has the waste management system

1627
00:59:57,910 --> 00:59:56,319
has been installed for a year so we um

1628
00:59:59,430 --> 00:59:57,920
and and in terms of that one

1629
01:00:01,030 --> 00:59:59,440
specifically that same waste management

1630
01:00:03,030 --> 01:00:01,040
system has been flown to space station

1631
01:00:04,789 --> 01:00:03,040
so um we mentioned about a lot of the

1632
01:00:06,950 --> 01:00:04,799
stuff we do on space station and forming

1633
01:00:08,630 --> 01:00:06,960
our our data we use that as a test bed

1634
01:00:10,230 --> 01:00:08,640
all the time to prove out the things

1635
01:00:12,390 --> 01:00:10,240
like fluid dynamics you really want to

1636
01:00:13,670 --> 01:00:12,400
test in zero gravity right so so the

1637
01:00:14,870 --> 01:00:13,680
waste management system is on board

1638
01:00:16,309 --> 01:00:14,880

today

1639
01:00:21,109 --> 01:00:16,319
we did have another second question for

1640
01:00:24,950 --> 01:00:23,030
hi that was a great question so um our

1641
01:00:27,030 --> 01:00:24,960
requirements for getting crew to med bay

1642
01:00:28,470 --> 01:00:27,040
is two hours i will tell you that our

1643
01:00:29,990 --> 01:00:28,480
estimates think that we can beat that

1644
01:00:31,349 --> 01:00:30,000
pretty significantly we think we're

1645
01:00:33,349 --> 01:00:31,359
looking at about

1646
01:00:35,270 --> 01:00:33,359
um 80 minutes

1647
01:00:36,710 --> 01:00:35,280
i will tell you that however the capsule

1648
01:00:39,109 --> 01:00:36,720
that you saw on the picture that we

1649
01:00:41,270 --> 01:00:39,119
showed you does not have an interior

1650
01:00:43,510 --> 01:00:41,280
and the trainer that we're using to

1651
01:00:45,589 --> 01:00:43,520
refine those egress procedures with the

1652
01:00:47,190 --> 01:00:45,599
dod and timing

1653
01:00:48,950 --> 01:00:47,200
is almost finished it's actually going

1654
01:00:51,270 --> 01:00:48,960
through final stages of verification and

1655
01:00:53,109 --> 01:00:51,280
validation so as soon as artist one is

1656
01:00:53,990 --> 01:00:53,119
over the very first underweight test we

1657
01:00:55,990 --> 01:00:54,000
will

1658
01:00:58,390 --> 01:00:56,000
embark on with the navy we'll have that

1659
01:01:00,710 --> 01:00:58,400
new capsule that has a hatch and seats

1660
01:01:02,710 --> 01:01:00,720
in it and we'll we'll start refining how

1661
01:01:04,630 --> 01:01:02,720
quickly we can get to the capsule open

1662
01:01:07,349 --> 01:01:04,640
the hatch get the crew out and get them

1663
01:01:08,870 --> 01:01:07,359

to med bay on the ship so um estimate is

1664
01:01:10,390 --> 01:01:08,880
80 minutes at this time but we think

1665
01:01:12,549 --> 01:01:10,400
that we can beat that and refine those

1666
01:01:14,309 --> 01:01:12,559
procedures

1667
01:01:16,470 --> 01:01:14,319
excellent let's go back in the room

1668
01:01:19,910 --> 01:01:16,480
gina sarah abc news i think this is for

1669
01:01:22,710 --> 01:01:19,920
you rick if you launch at 8 33 a.m it's

1670
01:01:24,630 --> 01:01:22,720
a 42 day mission if your launch slips in

1671
01:01:26,950 --> 01:01:24,640
that window how does the mission

1672
01:01:28,069 --> 01:01:26,960
duration change and why

1673
01:01:29,349 --> 01:01:28,079
okay

1674
01:01:32,069 --> 01:01:29,359
actually the mission duration doesn't

1675
01:01:35,750 --> 01:01:33,670
it'll force our team to do a lot of

1676
01:01:37,510 --> 01:01:35,760
replanting

1677
01:01:39,750 --> 01:01:37,520
but for the most part the mission is is

1678
01:01:40,470 --> 01:01:39,760
identical um that's a beautiful thing

1679
01:01:42,069 --> 01:01:40,480
about

1680
01:01:43,589 --> 01:01:42,079
allowing for a two-hour launch window

1681
01:01:46,789 --> 01:01:43,599
gives us flexibility for the launch

1682
01:01:48,470 --> 01:01:46,799
teams uh to successfully launch um and

1683
01:01:51,190 --> 01:01:48,480
and we can still execute the same

1684
01:01:54,150 --> 01:01:51,200
mission uh things the burns the primary

1685
01:01:56,309 --> 01:01:54,160
burns may slide on the order of minutes

1686
01:01:58,710 --> 01:01:56,319
but pretty much the the mission will be

1687
01:02:01,109 --> 01:01:58,720
exact the exact same and i'll add on to

1688
01:02:03,349 --> 01:02:01,119

that so the reason that's that it's the

1689
01:02:05,589 --> 01:02:03,359
same duration is every launch day we're

1690
01:02:06,789 --> 01:02:05,599
targeting the same point in space for

1691
01:02:09,750 --> 01:02:06,799
tli

1692
01:02:11,349 --> 01:02:09,760
translator injection and so the when we

1693
01:02:13,430 --> 01:02:11,359
move through that window we're just

1694
01:02:15,829 --> 01:02:13,440
changing the angle at which the rocket

1695
01:02:18,950 --> 01:02:15,839
is is approaching that tli and actually

1696
01:02:20,789 --> 01:02:18,960
that tli is moving westwardly uh you

1697
01:02:22,870 --> 01:02:20,799
know throughout that that window so

1698
01:02:24,789 --> 01:02:22,880
we're changing the the the angle which

1699
01:02:26,630 --> 01:02:24,799
we're approaching

1700
01:02:28,470 --> 01:02:26,640
and at risk of getting way out over my

1701
01:02:30,069 --> 01:02:28,480
skis so we're gonna we're gonna roll

1702
01:02:31,990 --> 01:02:30,079
here we have three launch temps right

1703
01:02:34,390 --> 01:02:32,000
we've got uh the the 29th i think the

1704
01:02:36,470 --> 01:02:34,400
second and the fifth but i think this is

1705
01:02:38,470 --> 01:02:36,480
a really important point

1706
01:02:40,789 --> 01:02:38,480
we're flying this vehicle

1707
01:02:42,390 --> 01:02:40,799
as a test flight we do not know

1708
01:02:44,069 --> 01:02:42,400
everything we've modeled everything

1709
01:02:46,309 --> 01:02:44,079
we've evaluated everything we've tested

1710
01:02:47,670 --> 01:02:46,319
everything we can test on the ground but

1711
01:02:49,589 --> 01:02:47,680
it's a whole different ballgame when you

1712
01:02:51,910 --> 01:02:49,599
roll to the pad and you go to get off of

1713
01:02:53,750 --> 01:02:51,920

that pad so there's there's a very solid

1714
01:02:55,589 --> 01:02:53,760
chance we roll we go for the 29th we

1715
01:02:56,789 --> 01:02:55,599
don't make the 29th and there's a chance

1716
01:02:57,990 --> 01:02:56,799
we don't make the second or the fifth

1717
01:02:59,910 --> 01:02:58,000
and in that case then we're gonna roll

1718
01:03:01,510 --> 01:02:59,920
back to the vab we're gonna reset a few

1719
01:03:03,349 --> 01:03:01,520
systems and we're gonna go back out that

1720
01:03:04,990 --> 01:03:03,359
next set of three launch attempts we do

1721
01:03:08,390 --> 01:03:05,000
go to the shorter class

1722
01:03:09,910 --> 01:03:08,400
22 i think day mission so just just keep

1723
01:03:11,270 --> 01:03:09,920
in mind there there's a lot of unknowns

1724
01:03:13,750 --> 01:03:11,280
still out there so

1725
01:03:14,870 --> 01:03:13,760
yeah so just make sure it's clear so the

1726
01:03:16,309 --> 01:03:14,880
29th

1727
01:03:17,829 --> 01:03:16,319
the second and the fifth are all long

1728
01:03:19,910 --> 01:03:17,839
class they're going to all be 40 plus

1729
01:03:21,029 --> 01:03:19,920
day missions uh then but if we roll back

1730
01:03:23,270 --> 01:03:21,039
and then we go into the next launch

1731
01:03:24,950 --> 01:03:23,280
period then we start off uh it's

1732
01:03:27,829 --> 01:03:24,960
generally the first part of the of the

1733
01:03:29,270 --> 01:03:27,839
launch window uh which is several weeks

1734
01:03:32,390 --> 01:03:29,280
is a short class and then we transition

1735
01:03:36,549 --> 01:03:34,710
um hey this is

1736
01:03:39,829 --> 01:03:36,559
okay bill harvey with cbs news i just

1737
01:03:41,750 --> 01:03:39,839
want to follow up on on those last ones

1738
01:03:43,670 --> 01:03:41,760

you know we've all been told the 29th

1739
01:03:45,670 --> 01:03:43,680
second and fifth charlie blackwell

1740
01:03:46,470 --> 01:03:45,680
thompson said last week earlier this

1741
01:03:48,069 --> 01:03:46,480
week

1742
01:03:49,829 --> 01:03:48,079
if you rolled out on the 18th she said

1743
01:03:51,349 --> 01:03:49,839
you get two attempts

1744
01:03:53,109 --> 01:03:51,359
explain what's going on here i don't

1745
01:03:54,950 --> 01:03:53,119
understand the flight determination

1746
01:03:57,029 --> 01:03:54,960
system

1747
01:03:57,510 --> 01:03:57,039
when does that

1748
01:03:59,829 --> 01:03:57,520
if clock that 20

1749
01:04:01,029 --> 01:03:59,839
20-day clock when does the 20-day clock

1750
01:04:02,870 --> 01:04:01,039
start ticking

1751
01:04:04,710 --> 01:04:02,880
if you roll down on the 18th what's your

1752
01:04:06,150 --> 01:04:04,720
last opportunity to climb up or do you

1753
01:04:08,309 --> 01:04:06,160
really get all three of those

1754
01:04:10,470 --> 01:04:08,319
opportunities or not

1755
01:04:12,630 --> 01:04:10,480
a second question i'm squeezing in i'm

1756
01:04:13,829 --> 01:04:12,640
not standing in my driveway looking at

1757
01:04:16,789 --> 01:04:13,839
it

1758
01:04:18,950 --> 01:04:16,799
finger what is the look at the

1759
01:04:21,029 --> 01:04:18,960
orientation of that moment

1760
01:04:24,549 --> 01:04:21,039
as i'm looking at the room because oh

1761
01:04:37,750 --> 01:04:25,590
what is

1762
01:04:41,430 --> 01:04:39,510
we actually didn't capture that for tv

1763
01:04:42,710 --> 01:04:41,440

so just a quick quick reiteration and

1764
01:04:44,789 --> 01:04:42,720
then answer it thank you the first

1765
01:04:46,789 --> 01:04:44,799
question that bill had was

1766
01:04:48,470 --> 01:04:46,799
what what is the actual constraint on

1767
01:04:50,390 --> 01:04:48,480
the flight termination system and where

1768
01:04:51,750 --> 01:04:50,400
does the 20 days that charlie blackwell

1769
01:04:54,150 --> 01:04:51,760
thompson

1770
01:04:55,829 --> 01:04:54,160
talked about come from us and and

1771
01:04:57,750 --> 01:04:55,839
where's the clock start so the clock

1772
01:05:00,950 --> 01:04:57,760
starts uh during the processing in the

1773
01:05:03,430 --> 01:05:00,960
vab uh that that window starts when they

1774
01:05:05,589 --> 01:05:03,440
they do they install the ftfs batteries

1775
01:05:07,510 --> 01:05:05,599
the they they charge them up that's when

1776
01:05:09,029 --> 01:05:07,520
the certification uh

1777
01:05:11,670 --> 01:05:09,039
period

1778
01:05:13,829 --> 01:05:11,680
or the starts at 20 days so i

1779
01:05:15,349 --> 01:05:13,839
i believe and i'm i'm not exactly sure

1780
01:05:17,750 --> 01:05:15,359
the day that they're planning to do that

1781
01:05:21,270 --> 01:05:17,760
but that'll be around like the 16th or

1782
01:05:24,470 --> 01:05:21,280
17th something like that 20 days later

1783
01:05:26,309 --> 01:05:24,480
the range has has has told them that

1784
01:05:28,230 --> 01:05:26,319
the batteries are only certified for 20

1785
01:05:29,109 --> 01:05:28,240
days and so i think that puts you right

1786
01:05:31,349 --> 01:05:29,119
after

1787
01:05:32,710 --> 01:05:31,359
uh the the second so like the third or

1788
01:05:35,270 --> 01:05:32,720

fourth uh

1789
01:05:37,109 --> 01:05:35,280
right there not quite to the fifth

1790
01:05:39,109 --> 01:05:37,119
and so that's where you know how why she

1791
01:05:41,910 --> 01:05:39,119
quoted uh two days attempt right because

1792
01:05:44,549 --> 01:05:41,920
the that 20 day certification ends right

1793
01:05:46,789 --> 01:05:44,559
on the edge of of of being able to pick

1794
01:05:48,630 --> 01:05:46,799
up the fifth i do know that uh they are

1795
01:05:50,230 --> 01:05:48,640
in talks with the range the the eastern

1796
01:05:51,829 --> 01:05:50,240
range to try to extend that

1797
01:05:54,549 --> 01:05:51,839
certification

1798
01:05:56,549 --> 01:05:54,559
to a little bit longer than 20 days

1799
01:05:58,309 --> 01:05:56,559
hopefully to bring in a third attempt

1800
01:06:01,589 --> 01:05:58,319
but those those negotiations

1801
01:06:04,390 --> 01:06:01,599
negotiations are still in work

1802
01:06:06,549 --> 01:06:04,400
as far as your second question um

1803
01:06:09,990 --> 01:06:06,559
yeah rick you want to take on sure

1804
01:06:11,430 --> 01:06:10,000
um so uh your reference from standing on

1805
01:06:13,510 --> 01:06:11,440
earth watching it is very similar to

1806
01:06:15,750 --> 01:06:13,520
what the apollo uh trajectories looked

1807
01:06:19,190 --> 01:06:15,760
like in that it's it's in us the earth

1808
01:06:21,430 --> 01:06:19,200
moon plane so as we fly by the the moon

1809
01:06:23,190 --> 01:06:21,440
and do that outbound powered flyby like

1810
01:06:24,870 --> 01:06:23,200
it will be on the back side

1811
01:06:26,069 --> 01:06:24,880
and we'll lose com come with it and then

1812
01:06:27,990 --> 01:06:26,079
it just goes up and we'll stay in that

1813
01:06:30,870 --> 01:06:28,000

plane and it's doing a big orbit around

1814
01:06:33,190 --> 01:06:30,880
there so uh when we do that big the big

1815
01:06:35,349 --> 01:06:33,200
orbit that first six days we're going to

1816
01:06:37,750 --> 01:06:35,359
have a loss of calm for on the order of

1817
01:06:39,829 --> 01:06:37,760
three hours while because the the moon

1818
01:06:41,990 --> 01:06:39,839
is blocking the the pathway to the to

1819
01:06:43,349 --> 01:06:42,000
the earth so it's very similar to apollo

1820
01:06:45,510 --> 01:06:43,359
just a lot farther they would go in

1821
01:06:50,870 --> 01:06:45,520
lunar orbit and we're going to be that

1822
01:06:50,880 --> 01:06:56,069
yeah it all depends but yes probably

1823
01:06:59,670 --> 01:06:58,150
hi guys tom costello with nbc news thank

1824
01:07:01,109 --> 01:06:59,680
you for a terrific briefing thank you

1825
01:07:02,950 --> 01:07:01,119
very much i had a couple of quick

1826
01:07:05,109 --> 01:07:02,960
follow-ups uh you had mentioned that

1827
01:07:08,150 --> 01:07:05,119
there are two blackout periods on

1828
01:07:09,990 --> 01:07:08,160
re-entry and i'm blackout for comms i'm

1829
01:07:11,510 --> 01:07:10,000
curious why that is shuttle as i

1830
01:07:12,710 --> 01:07:11,520
understand did not have any blackout

1831
01:07:16,230 --> 01:07:12,720
periods

1832
01:07:18,630 --> 01:07:16,240
so what's changed is it the re-entry uh

1833
01:07:21,109 --> 01:07:18,640
position is it the speed why why two

1834
01:07:23,510 --> 01:07:21,119
blackout periods on re-entry and then

1835
01:07:26,230 --> 01:07:23,520
the second one is uh if there were to be

1836
01:07:28,549 --> 01:07:26,240
a reason to abort on liftoff any chance

1837
01:07:31,750 --> 01:07:28,559
at all of aborting to the space station

1838
01:07:34,309 --> 01:07:31,760

or is that not possible at all

1839
01:07:36,870 --> 01:07:34,319
thanks tom good questions uh as far as

1840
01:07:38,630 --> 01:07:36,880
the blackout period uh the uh the

1841
01:07:40,069 --> 01:07:38,640
orientation of the antennas that's that

1842
01:07:42,230 --> 01:07:40,079
all has to do with why the shuttle

1843
01:07:43,589 --> 01:07:42,240
didn't have the blackout originally

1844
01:07:46,150 --> 01:07:43,599
early on in the shuttle program there

1845
01:07:47,990 --> 01:07:46,160
were like blackout periods uh until they

1846
01:07:49,510 --> 01:07:48,000
were able to get antennas on top of the

1847
01:07:51,750 --> 01:07:49,520
shuttle to look up at the teter

1848
01:07:54,069 --> 01:07:51,760
satellites uh as far as the double

1849
01:07:56,230 --> 01:07:54,079
blackout it's just antenna orientation

1850
01:07:58,390 --> 01:07:56,240
and there's lots of plasma coming around

1851
01:08:01,029 --> 01:07:58,400
uh you know the the the vehicle

1852
01:08:02,549 --> 01:08:01,039
i believe the soyuz is the same same

1853
01:08:04,390 --> 01:08:02,559
as the same issue right you know there

1854
01:08:06,710 --> 01:08:04,400
there's a period of time where there's

1855
01:08:09,109 --> 01:08:06,720
there's blackout due to the the plasma

1856
01:08:10,549 --> 01:08:09,119
field uh as far as

1857
01:08:12,710 --> 01:08:10,559
your second question

1858
01:08:15,109 --> 01:08:12,720
uh no there's not it's not a possibility

1859
01:08:18,870 --> 01:08:15,119
abort to the space station not even

1860
01:08:22,070 --> 01:08:19,829
okay

1861
01:08:24,309 --> 01:08:22,080
so

1862
01:08:26,390 --> 01:08:24,319
it's good okay uh joanna pinkwood from

1863
01:08:27,990 --> 01:08:26,400

polish public television uh the question

1864
01:08:29,110 --> 01:08:28,000
will be for reid

1865
01:08:33,669 --> 01:08:29,120
uh

1866
01:08:34,470 --> 01:08:33,679
mission need some different training

1867
01:08:37,030 --> 01:08:34,480
than

1868
01:08:38,950 --> 01:08:37,040
other astronauts who are flying for the

1869
01:08:42,309 --> 01:08:38,960
iss or something like that

1870
01:08:46,550 --> 01:08:44,470
all right so

1871
01:08:49,030 --> 01:08:46,560
the way i look at it is uh right now we

1872
01:08:51,110 --> 01:08:49,040
have 42 active nasa astronauts here

1873
01:08:52,630 --> 01:08:51,120
artemis is an international program and

1874
01:08:54,789 --> 01:08:52,640
we'll be flying

1875
01:08:57,510 --> 01:08:54,799
colleagues from around

1876
01:08:58,550 --> 01:08:57,520
earth on this on this vehicle as we move

1877
01:08:59,910 --> 01:08:58,560
forward

1878
01:09:01,910 --> 01:08:59,920
right now

1879
01:09:04,070 --> 01:09:01,920
every one of our astronauts is eligible

1880
01:09:05,749 --> 01:09:04,080
for an artemis mission so if you get

1881
01:09:07,990 --> 01:09:05,759
assigned to a space station mission you

1882
01:09:09,510 --> 01:09:08,000
go into a space station trading track if

1883
01:09:10,950 --> 01:09:09,520
you're assigned to an artemis mission

1884
01:09:13,349 --> 01:09:10,960
down the road you'll go into a very

1885
01:09:14,709 --> 01:09:13,359
specific artemis training track

1886
01:09:17,110 --> 01:09:14,719
while we're not assigned to those

1887
01:09:18,870 --> 01:09:17,120
missions we i personally want our

1888
01:09:21,669 --> 01:09:18,880

astronauts to be as well-rounded as

1889
01:09:24,630 --> 01:09:21,679
possible even though you may not walk on

1890
01:09:25,829 --> 01:09:24,640
the moon studying geology in pangaea

1891
01:09:27,189 --> 01:09:25,839
helps you when you're on the space

1892
01:09:28,950 --> 01:09:27,199
station looking down at our earth

1893
01:09:31,110 --> 01:09:28,960
looking at the geologic processes that

1894
01:09:32,550 --> 01:09:31,120
you get to see for six months or a year

1895
01:09:34,789 --> 01:09:32,560
when you're looking down

1896
01:09:37,269 --> 01:09:34,799
and the thing you never get with robotic

1897
01:09:39,110 --> 01:09:37,279
missions are these eyes in this brain

1898
01:09:40,470 --> 01:09:39,120
and we can think up some crazy things

1899
01:09:42,229 --> 01:09:40,480
when we are left to be a little bit

1900
01:09:44,070 --> 01:09:42,239
bored it's just amazing what you get to

1901
01:09:45,669 --> 01:09:44,080
think about on the space station for six

1902
01:09:47,430 --> 01:09:45,679
months when you look down at our

1903
01:09:49,590 --> 01:09:47,440
beautiful planet and watch it orbit the

1904
01:09:51,510 --> 01:09:49,600
sun and see how it changes so

1905
01:09:52,789 --> 01:09:51,520
we're i say we're all the same until you

1906
01:09:54,229 --> 01:09:52,799
get assigned a mission and then you go

1907
01:09:56,470 --> 01:09:54,239
into a specific

1908
01:09:58,550 --> 01:09:56,480
training track and for age

1909
01:10:01,830 --> 01:09:58,560
we have anywhere from late 20s all the

1910
01:10:03,830 --> 01:10:01,840
way up to mid 60s and as long as you are

1911
01:10:05,590 --> 01:10:03,840
healthy there's there is a tiny bit of

1912
01:10:07,510 --> 01:10:05,600
medical testing on us

1913
01:10:08,550 --> 01:10:07,520

as long as you are healthy then we're

1914
01:10:10,470 --> 01:10:08,560
going to load you in a rocket and shoot

1915
01:10:16,310 --> 01:10:10,480
you off the planet

1916
01:10:19,910 --> 01:10:18,229
good morning uh jeff faust of space news

1917
01:10:21,669 --> 01:10:19,920
uh artemis one's flying the distant

1918
01:10:23,110 --> 01:10:21,679
retrograde orbit which is not an orbit

1919
01:10:24,630 --> 01:10:23,120
that you're planning to use for future

1920
01:10:26,229 --> 01:10:24,640
artemis missions i wonder if you can

1921
01:10:28,550 --> 01:10:26,239
talk about some of the the benefits and

1922
01:10:30,310 --> 01:10:28,560
trade-offs of flying dro versus the near

1923
01:10:32,790 --> 01:10:30,320
rectilinear halo over that you're going

1924
01:10:33,669 --> 01:10:32,800
to be using for artemis 3 and beyond and

1925
01:10:34,870 --> 01:10:33,679
also

1926
01:10:36,709 --> 01:10:34,880
the difference between the short and the

1927
01:10:39,030 --> 01:10:36,719
long class missions are there mission

1928
01:10:40,630 --> 01:10:39,040
objectives that you would be able to

1929
01:10:42,149 --> 01:10:40,640
achieve with a long class mission that

1930
01:10:43,910 --> 01:10:42,159
you would not be able to achieve with a

1931
01:10:46,310 --> 01:10:43,920
short class mission because of less time

1932
01:10:47,750 --> 01:10:46,320
in the gro

1933
01:10:49,030 --> 01:10:47,760
i'll take a shot of that one

1934
01:10:50,950 --> 01:10:49,040
um

1935
01:10:52,470 --> 01:10:50,960
so i'm i'm very focused on the artist

1936
01:10:54,310 --> 01:10:52,480
one mission so i don't have a lot of

1937
01:10:56,149 --> 01:10:54,320
knowledge about the other artemis

1938
01:10:58,070 --> 01:10:56,159

missions but i think the knowledge will

1939
01:11:00,390 --> 01:10:58,080
gain from you know getting to the moon

1940
01:11:02,149 --> 01:11:00,400
and getting to the uh getting back that

1941
01:11:04,470 --> 01:11:02,159
how we're gonna build trajectories and

1942
01:11:06,070 --> 01:11:04,480
burn plants to do that uh and that's

1943
01:11:07,910 --> 01:11:06,080
exactly what we're gonna use once we get

1944
01:11:10,709 --> 01:11:07,920
to the moon in order to get into these

1945
01:11:13,430 --> 01:11:10,719
these specific uh orbits around the moon

1946
01:11:15,510 --> 01:11:13,440
so artemis one albeit it's very

1947
01:11:17,430 --> 01:11:15,520
different from uh as you as you alluded

1948
01:11:19,030 --> 01:11:17,440
to uh we'll still gain all the knowledge

1949
01:11:21,110 --> 01:11:19,040
for how this vehicle is going to operate

1950
01:11:23,030 --> 01:11:21,120
uh as far as the burn plans and and

1951
01:11:24,310 --> 01:11:23,040
targeting these special these special

1952
01:11:27,270 --> 01:11:24,320
burns that put us in these different

1953
01:11:28,950 --> 01:11:27,280
orbits once we get to the moon

1954
01:11:30,149 --> 01:11:28,960
for your second question regarding the

1955
01:11:31,430 --> 01:11:30,159
difference between the short class and

1956
01:11:33,189 --> 01:11:31,440
long class

1957
01:11:34,870 --> 01:11:33,199
actually we will be able to accomplish

1958
01:11:36,870 --> 01:11:34,880
all of our mission objectives on a short

1959
01:11:37,910 --> 01:11:36,880
class mission they're just um they're

1960
01:11:40,470 --> 01:11:37,920
just

1961
01:11:41,910 --> 01:11:40,480
they'll be closer closer together but we

1962
01:11:45,030 --> 01:11:41,920
will be able to accomplish all of them

1963
01:11:46,550 --> 01:11:45,040

even on a 26 to 28 day 28 day mission

1964
01:11:48,470 --> 01:11:46,560
the things we the challenges we have to

1965
01:11:50,870 --> 01:11:48,480
deal with is we have thermal constraints

1966
01:11:52,830 --> 01:11:50,880
where we can go out of attitude to do

1967
01:11:55,270 --> 01:11:52,840
some of these activities

1968
01:11:57,510 --> 01:11:55,280
um but once you go out attitude you're

1969
01:11:59,669 --> 01:11:57,520
limited to three hours and then once you

1970
01:12:01,830 --> 01:11:59,679
come back into attitude you have to be a

1971
01:12:03,350 --> 01:12:01,840
tale to son for 10 hours to get the

1972
01:12:05,590 --> 01:12:03,360
thermal recovery before you go off and

1973
01:12:08,630 --> 01:12:05,600
do another one so to plan all these

1974
01:12:10,709 --> 01:12:08,640
activities these events to ensure that

1975
01:12:12,870 --> 01:12:10,719
we can meet all the objectives it's a

1976
01:12:14,470 --> 01:12:12,880
very tightly choreographed timeline to

1977
01:12:17,430 --> 01:12:14,480
ensure that we meet all the thermal

1978
01:12:18,870 --> 01:12:17,440
constraints but uh we've built timelines

1979
01:12:21,430 --> 01:12:18,880
for the short class missions and we can

1980
01:12:23,750 --> 01:12:21,440
meet all our objectives

1981
01:12:25,350 --> 01:12:23,760
the distant retrograde orbit um you know

1982
01:12:27,510 --> 01:12:25,360
it because of the

1983
01:12:29,110 --> 01:12:27,520
the moon earth gravity interaction with

1984
01:12:30,550 --> 01:12:29,120
that orbit we can stay in it's very

1985
01:12:32,390 --> 01:12:30,560
stable takes very little prop to

1986
01:12:33,750 --> 01:12:32,400
actually stay in that orbit so that's

1987
01:12:35,270 --> 01:12:33,760
one of the advantages of being there we

1988
01:12:36,470 --> 01:12:35,280

can get a very long mission really ring

1989
01:12:38,149 --> 01:12:36,480
out the systems whether it's a short

1990
01:12:39,510 --> 01:12:38,159
class or long class it's going to be

1991
01:12:41,510 --> 01:12:39,520
quite a bit longer than the first crude

1992
01:12:43,270 --> 01:12:41,520
flight which is targeted 10 to 12 days

1993
01:12:45,189 --> 01:12:43,280
something like that so so we're getting

1994
01:12:46,790 --> 01:12:45,199
this this very long orbit we can really

1995
01:12:48,550 --> 01:12:46,800
bring out the systems without a whole

1996
01:12:49,830 --> 01:12:48,560
lot of prop load just to stay there

1997
01:12:51,510 --> 01:12:49,840
that's part of it and then looking

1998
01:12:53,830 --> 01:12:51,520
forward for the nra

1999
01:12:56,390 --> 01:12:53,840
for artemis 2 and beyond the advantage

2000
01:12:58,470 --> 01:12:56,400
of that orbit is that it's always facing

2001
01:13:00,229 --> 01:12:58,480
the earth right so you have something

2002
01:13:01,030 --> 01:13:00,239
that's always facing the earth

2003
01:13:02,550 --> 01:13:01,040
and

2004
01:13:03,990 --> 01:13:02,560
it'll allow

2005
01:13:06,310 --> 01:13:04,000
several different types of vehicle

2006
01:13:08,630 --> 01:13:06,320
whether it be orion or the the lander uh

2007
01:13:16,790 --> 01:13:08,640
to to rendezvous with the gateway and

2008
01:13:20,470 --> 01:13:18,470
there you go dan schaefer weight 31 in

2009
01:13:22,950 --> 01:13:20,480
huntsville this is a follow-up for reid

2010
01:13:25,030 --> 01:13:22,960
on the astronaut so you've culled

2011
01:13:27,030 --> 01:13:25,040
40 odd astronauts now down to about 10

2012
01:13:29,110 --> 01:13:27,040
who want to fly on these first

2013
01:13:29,830 --> 01:13:29,120

couple of crude missions how did you do

2014
01:13:33,590 --> 01:13:29,840
that

2015
01:13:35,270 --> 01:13:33,600
we have 42 active astronauts and then

2016
01:13:38,149 --> 01:13:35,280
earlier this year some of you folks were

2017
01:13:39,990 --> 01:13:38,159
here we uh we announced our latest class

2018
01:13:41,750 --> 01:13:40,000
of astronaut candidates with 10

2019
01:13:43,750 --> 01:13:41,760
americans from across our country all

2020
01:13:45,030 --> 01:13:43,760
walks of life to join our corps and

2021
01:13:47,189 --> 01:13:45,040
they're in their initial training right

2022
01:13:50,149 --> 01:13:47,199
now when they graduate in about 18

2023
01:13:52,070 --> 01:13:50,159
months then they'll come into the the 42

2024
01:13:54,790 --> 01:13:52,080
active astronauts with us

2025
01:13:56,390 --> 01:13:54,800
right now we are look truly that we have

2026
01:13:58,950 --> 01:13:56,400
not made any flight assignments we have

2027
01:14:00,630 --> 01:13:58,960
not necked down who is going to do what

2028
01:14:03,270 --> 01:14:00,640
missions at this point in time we want

2029
01:14:04,790 --> 01:14:03,280
to watch artemis 1

2030
01:14:06,709 --> 01:14:04,800
and then we want to make the right smart

2031
01:14:10,229 --> 01:14:06,719
decision when we assign 2 and then

2032
01:14:14,630 --> 01:14:12,070
thank you so much roseanne aragon with

2033
01:14:16,470 --> 01:14:14,640
kprc thank you so much for making time

2034
01:14:18,310 --> 01:14:16,480
for us i have two questions

2035
01:14:20,229 --> 01:14:18,320
the first is for reid

2036
01:14:22,709 --> 01:14:20,239
we know the apollo generation is

2037
01:14:24,630 --> 01:14:22,719
watching and this means so much to them

2038
01:14:26,950 --> 01:14:24,640

what is your message to those who worked

2039
01:14:29,110 --> 01:14:26,960
on the apollo program and how their

2040
01:14:30,630 --> 01:14:29,120
expertise contributed to what you're

2041
01:14:33,110 --> 01:14:30,640
working on today

2042
01:14:36,470 --> 01:14:33,120
uh what i would say to them is thank you

2043
01:14:38,870 --> 01:14:36,480
uh that apollo generation

2044
01:14:41,110 --> 01:14:38,880
landed humans on the moon at a period

2045
01:14:42,790 --> 01:14:41,120
where i truly look back and think it was

2046
01:14:45,030 --> 01:14:42,800
impossible

2047
01:14:46,310 --> 01:14:45,040
and then that technology the the very

2048
01:14:48,310 --> 01:14:46,320
johnson space center that we're sitting

2049
01:14:49,830 --> 01:14:48,320
at right now is a legacy of the apollo

2050
01:14:51,270 --> 01:14:49,840
era

2051
01:14:52,709 --> 01:14:51,280
but i don't think about that when i

2052
01:14:54,550 --> 01:14:52,719
think about apollo when i think about

2053
01:14:56,550 --> 01:14:54,560
apollo i think about

2054
01:14:57,990 --> 01:14:56,560
every kid that watched that landing and

2055
01:14:59,590 --> 01:14:58,000
wanted to work in mission control that

2056
01:15:01,430 --> 01:14:59,600
wanted to be an astronaut that wanted to

2057
01:15:03,990 --> 01:15:01,440
be a doctor that wanted to be a school

2058
01:15:05,910 --> 01:15:04,000
teacher like the impact of what apollo

2059
01:15:08,630 --> 01:15:05,920
did was not putting neil armstrong and

2060
01:15:11,990 --> 01:15:08,640
buzz aldrin on the moon it was changing

2061
01:15:13,910 --> 01:15:12,000
the way we look at stem completely there

2062
01:15:16,630 --> 01:15:13,920
is you know there is nothing that

2063
01:15:18,310 --> 01:15:16,640

motivates someone more than doing

2064
01:15:20,630 --> 01:15:18,320
and that is what apollo did and that is

2065
01:15:21,990 --> 01:15:20,640
what artemis is going to do we are going

2066
01:15:24,950 --> 01:15:22,000
out there and we are going to do this

2067
01:15:27,270 --> 01:15:24,960
and that way you really energize

2068
01:15:29,270 --> 01:15:27,280
everyone

2069
01:15:31,350 --> 01:15:29,280
my second question is a more of a

2070
01:15:32,790 --> 01:15:31,360
technical question i see a lot of big

2071
01:15:34,790 --> 01:15:32,800
mission objectives here testing the

2072
01:15:36,229 --> 01:15:34,800
guidance and navigation control

2073
01:15:37,510 --> 01:15:36,239
seeing how the orbital maneuvering

2074
01:15:39,669 --> 01:15:37,520
system does

2075
01:15:42,709 --> 01:15:39,679
making sure you nail the return power

2076
01:15:44,149 --> 01:15:42,719
flyby what is your margin of error

2077
01:15:45,990 --> 01:15:44,159
especially considering some of these

2078
01:15:48,149 --> 01:15:46,000
things have never been done to this

2079
01:15:50,229 --> 01:15:48,159
capacity at all what's your margin of

2080
01:15:54,149 --> 01:15:50,239
error and what does success look like if

2081
01:15:59,030 --> 01:15:55,990
okay uh well

2082
01:16:00,630 --> 01:15:59,040
the margin error is is small but those

2083
01:16:02,149 --> 01:16:00,640
trajectory correction maneuvers that i'm

2084
01:16:03,189 --> 01:16:02,159
talking about uh

2085
01:16:04,550 --> 01:16:03,199
they um

2086
01:16:05,990 --> 01:16:04,560
they're what are going to ensure that

2087
01:16:08,070 --> 01:16:06,000
when we fly by the moon we're at the

2088
01:16:09,270 --> 01:16:08,080

right altitude then we don't run into it

2089
01:16:11,910 --> 01:16:09,280
um

2090
01:16:14,630 --> 01:16:11,920
and i talked about uh

2091
01:16:15,750 --> 01:16:14,640
the burns uh we assign a criticality to

2092
01:16:17,430 --> 01:16:15,760
them so

2093
01:16:19,910 --> 01:16:17,440
a non-critical burn is one if we didn't

2094
01:16:22,149 --> 01:16:19,920
execute it no harm no foul we could pick

2095
01:16:25,270 --> 01:16:22,159
it up we could make it up later uh then

2096
01:16:27,189 --> 01:16:25,280
we have um mandatory burns where if you

2097
01:16:29,510 --> 01:16:27,199
don't execute that burn

2098
01:16:30,950 --> 01:16:29,520
then you lose a mission objective a good

2099
01:16:32,630 --> 01:16:30,960
example would be the outbound powered

2100
01:16:34,149 --> 01:16:32,640
flyby so

2101
01:16:36,229 --> 01:16:34,159
if we didn't do that then we wouldn't be

2102
01:16:38,630 --> 01:16:36,239
able to get up to the dro and do the dro

2103
01:16:40,149 --> 01:16:38,640
mission uh we'll still safely bring

2104
01:16:41,430 --> 01:16:40,159
orion back

2105
01:16:43,430 --> 01:16:41,440
but we won't be able to accomplish all

2106
01:16:45,750 --> 01:16:43,440
of our mission objectives and then the

2107
01:16:47,430 --> 01:16:45,760
last category is the critical burn

2108
01:16:49,030 --> 01:16:47,440
that's the return power flyby and that's

2109
01:16:50,709 --> 01:16:49,040
the one if we don't execute it then it's

2110
01:16:51,510 --> 01:16:50,719
a loss of the vehicle

2111
01:16:53,990 --> 01:16:51,520
um

2112
01:16:56,149 --> 01:16:54,000
so the margin air small but we have we

2113
01:16:57,990 --> 01:16:56,159

have opportunity to make sure that we

2114
01:16:59,990 --> 01:16:58,000
correct make all the right corrections

2115
01:17:02,149 --> 01:17:00,000
to make sure that we target our outbound

2116
01:17:04,790 --> 01:17:02,159
power flyby and our return power flyby

2117
01:17:07,189 --> 01:17:04,800
uh so uh confident that we'll be able to

2118
01:17:08,630 --> 01:17:07,199
execute the trajectories as necessary to

2119
01:17:10,310 --> 01:17:08,640
as long as the vehicle performs the way

2120
01:17:12,229 --> 01:17:10,320
it's designed where we're gonna get the

2121
01:17:14,630 --> 01:17:12,239
mission accomplished and i would add to

2122
01:17:17,110 --> 01:17:14,640
that that i mean this is a test flight

2123
01:17:19,030 --> 01:17:17,120
so uh we're also finding where the

2124
01:17:22,149 --> 01:17:19,040
margins are right we're finding where

2125
01:17:24,229 --> 01:17:22,159
the conservatism in in in the analysis

2126
01:17:26,550 --> 01:17:24,239
that we've been previously done and so

2127
01:17:27,990 --> 01:17:26,560
so in many respects we're continuing to

2128
01:17:31,030 --> 01:17:28,000
learn right so we'll find where those

2129
01:17:33,110 --> 01:17:31,040
margins are

2130
01:17:34,630 --> 01:17:33,120
hi i'm cooper heim with singularity and

2131
01:17:37,270 --> 01:17:34,640
everyday astronaut

2132
01:17:38,790 --> 01:17:37,280
apollo had hasselblad

2133
01:17:41,110 --> 01:17:38,800
as the camera on the moon and i'm

2134
01:17:44,470 --> 01:17:41,120
curious to know

2135
01:17:46,870 --> 01:17:44,480
does artemis have a camera

2136
01:17:48,310 --> 01:17:46,880
actually ours has a lot of cameras yeah

2137
01:17:49,669 --> 01:17:48,320
um

2138
01:17:51,110 --> 01:17:49,679

debbie probably could talk better to the

2139
01:17:53,510 --> 01:17:51,120
internal ones but on each of the solar

2140
01:17:55,910 --> 01:17:53,520
array wings we have we have a gopro

2141
01:17:57,590 --> 01:17:55,920
uh that wireless has a wireless link to

2142
01:17:59,750 --> 01:17:57,600
the to the crew module and we'll be

2143
01:18:01,430 --> 01:17:59,760
taking imagery uh a lot throughout the

2144
01:18:03,189 --> 01:18:01,440
entire mission and we'll be uh

2145
01:18:04,470 --> 01:18:03,199
transferring that imagery from the from

2146
01:18:06,950 --> 01:18:04,480
the gopro

2147
01:18:08,310 --> 01:18:06,960
gopro camera down to the uh we have

2148
01:18:09,910 --> 01:18:08,320
camera controllers internal to see him

2149
01:18:11,430 --> 01:18:09,920
and then we'll be bringing those down uh

2150
01:18:13,750 --> 01:18:11,440
down to the earth but there's internal

2151
01:18:15,189 --> 01:18:13,760
cameras also that i don't know the

2152
01:18:16,870 --> 01:18:15,199
make of those do you know yeah i don't

2153
01:18:18,870 --> 01:18:16,880
know the meg there are several cameras

2154
01:18:20,310 --> 01:18:18,880
cameras inside the crew module and

2155
01:18:21,990 --> 01:18:20,320
actually there's a technology

2156
01:18:23,350 --> 01:18:22,000
demonstration payload being flown called

2157
01:18:26,390 --> 01:18:23,360
callisto you can read about if you

2158
01:18:28,550 --> 01:18:26,400
haven't already um it's a collaboration

2159
01:18:29,990 --> 01:18:28,560
with alexa and actually so you'll have a

2160
01:18:31,990 --> 01:18:30,000
yeah you'll have a camera on board

2161
01:18:33,830 --> 01:18:32,000
you'll be seeing you know from a vantage

2162
01:18:35,669 --> 01:18:33,840
point of a crew member sitting in a seat

2163
01:18:37,910 --> 01:18:35,679

and actually participants can interact

2164
01:18:39,270 --> 01:18:37,920
with um that if you have a lex at home

2165
01:18:40,630 --> 01:18:39,280
you can ask questions where's artemis

2166
01:18:42,229 --> 01:18:40,640
today where's orion today what's

2167
01:18:43,750 --> 01:18:42,239
happening on the mission today so there

2168
01:18:44,950 --> 01:18:43,760
are there are various camera views both

2169
01:18:46,870 --> 01:18:44,960
externally you know some of that's

2170
01:18:48,310 --> 01:18:46,880
imagery you want to capture for post

2171
01:18:50,149 --> 01:18:48,320
fight analysis did things perform the

2172
01:18:51,910 --> 01:18:50,159
way we want or did that solar array

2173
01:18:53,350 --> 01:18:51,920
deploy and lock into place so definitely

2174
01:18:55,510 --> 01:18:53,360
definitely the camera's external help us

2175
01:18:57,669 --> 01:18:55,520
during the mission if we start seeing a

2176
01:18:59,110 --> 01:18:57,679
data that looks like an anomaly but then

2177
01:19:01,030 --> 01:18:59,120
a whole bunch of video inside too as

2178
01:19:03,189 --> 01:19:01,040
well for for just you know see what's

2179
01:19:05,669 --> 01:19:03,199
going on is that the same for whenever

2180
01:19:06,709 --> 01:19:05,679
they go down about the mostly gopro will

2181
01:19:08,390 --> 01:19:06,719
that be

2182
01:20:25,910 --> 01:19:08,400
a

2183
01:20:28,870 --> 01:20:25,920
big focus of this mission for both women

2184
01:20:30,709 --> 01:20:28,880
and people of color yeah absolutely that

2185
01:20:35,350 --> 01:20:30,719
that's

2186
01:20:37,350 --> 01:20:35,360
our job at nasa is to do the things that

2187
01:20:39,430 --> 01:20:37,360
are difficult and to do the things that

2188
01:20:41,669 --> 01:20:39,440

are right and to motivate

2189
01:20:43,830 --> 01:20:41,679
our base which is our youth

2190
01:20:46,390 --> 01:20:43,840
and right now our country is a is a

2191
01:20:49,030 --> 01:20:46,400
diverse and extremely rich country and

2192
01:20:50,870 --> 01:20:49,040
we want our astronaut core to look j we

2193
01:20:53,510 --> 01:20:50,880
want every kid in america to look at our

2194
01:20:56,390 --> 01:20:53,520
poster and say oh i see myself in that i

2195
01:20:58,550 --> 01:20:56,400
grew up poor or i grew up in this state

2196
01:21:00,709 --> 01:20:58,560
or i grew up with this type of family i

2197
01:21:03,030 --> 01:21:00,719
wanna i can do that someday and it's

2198
01:21:06,229 --> 01:21:03,040
really important for all of us to stand

2199
01:21:07,830 --> 01:21:06,239
together as we go and do this and

2200
01:21:09,270 --> 01:21:07,840
the the neatest part about getting to

2201
01:21:11,669 --> 01:21:09,280
work at the johnson space center and at

2202
01:21:14,149 --> 01:21:11,679
nasa as a whole is the team you work

2203
01:21:15,910 --> 01:21:14,159
with every day when you get to work the

2204
01:21:17,590 --> 01:21:15,920
the stories you can tell the flight

2205
01:21:19,669 --> 01:21:17,600
director class that we just hired that's

2206
01:21:22,229 --> 01:21:19,679
truly from all over our country and the

2207
01:21:23,990 --> 01:21:22,239
world it is an amazingly rich place to

2208
01:21:25,430 --> 01:21:24,000
work and it's reflected every year it's

2209
01:21:26,950 --> 01:21:25,440
the it's the best government agency to

2210
01:21:28,310 --> 01:21:26,960
work in and and there's a reason for

2211
01:21:29,990 --> 01:21:28,320
that because we're a bit progressive and

2212
01:21:31,270 --> 01:21:30,000
we really love what we do

2213
01:21:33,189 --> 01:21:31,280

all right i'm gonna go to the phone for

2214
01:21:34,310 --> 01:21:33,199
a second they've been very patient uh so

2215
01:21:36,070 --> 01:21:34,320
i just want to make give them an

2216
01:21:40,149 --> 01:21:36,080
opportunity as well marvin marshall with

2217
01:21:43,990 --> 01:21:41,990
hi my name is marvin marshall from the

2218
01:21:45,990 --> 01:21:44,000
nighttime news space report i appreciate

2219
01:21:48,870 --> 01:21:46,000
you guys having having us out here today

2220
01:21:50,070 --> 01:21:48,880
um now um my question kind of uh banks

2221
01:21:51,350 --> 01:21:50,080
on the camera

2222
01:21:52,470 --> 01:21:51,360
the camera question there no i was

2223
01:21:53,990 --> 01:21:52,480
wondering you know how much public

2224
01:21:55,910 --> 01:21:54,000
engagement will there be does it mean

2225
01:21:57,430 --> 01:21:55,920
the live streaming from orbit you know

2226
01:21:59,189 --> 01:21:57,440
pictures are 1000 words that you know

2227
01:22:01,189 --> 01:21:59,199
that video just does so much more for us

2228
01:22:02,870 --> 01:22:01,199
now will there be like an emphasis on

2229
01:22:05,350 --> 01:22:02,880
providing the public with live streams

2230
01:22:06,709 --> 01:22:05,360
after the launch live stream you know on

2231
01:22:08,790 --> 01:22:06,719
orbit and you know that initial live

2232
01:22:10,550 --> 01:22:08,800
stream and you know like on artemis one

2233
01:22:12,229 --> 01:22:10,560
or even artemis ii thank you for taking

2234
01:22:14,470 --> 01:22:12,239
our questions thank you

2235
01:22:15,910 --> 01:22:14,480
okay i'll try to answer that uh if i if

2236
01:22:16,629 --> 01:22:15,920
i heard it correctly and if i didn't you

2237
01:22:19,110 --> 01:22:16,639
can

2238
01:22:20,950 --> 01:22:19,120

ask again when i'm finished but um yes

2239
01:22:23,590 --> 01:22:20,960
throughout the mission we will be having

2240
01:22:25,189 --> 01:22:23,600
live stream uh imagery coming down uh

2241
01:22:27,189 --> 01:22:25,199
but it's in competition with all the

2242
01:22:29,110 --> 01:22:27,199
data that we need to get down as well uh

2243
01:22:31,590 --> 01:22:29,120
we we are limited on our data rates that

2244
01:22:33,510 --> 01:22:31,600
will be transmitting uh information down

2245
01:22:35,350 --> 01:22:33,520
from the from orion uh throughout the

2246
01:22:37,270 --> 01:22:35,360
mission uh there's periods where we'll

2247
01:22:39,430 --> 01:22:37,280
go to a higher day rate uh where we'll

2248
01:22:41,990 --> 01:22:39,440
be able to do imagery and then also keep

2249
01:22:43,910 --> 01:22:42,000
uh maintain our telemetry but

2250
01:22:46,790 --> 01:22:43,920
for a lot of these events we'll also be

2251
01:22:48,629 --> 01:22:46,800
uh recording the high resolution imagery

2252
01:22:51,830 --> 01:22:48,639
and then those would be downlinked after

2253
01:22:53,590 --> 01:22:51,840
the after the event um we have a

2254
01:22:56,070 --> 01:22:53,600
priority list of how we're going to

2255
01:22:58,550 --> 01:22:56,080
bring files off of the off of the uh

2256
01:22:59,750 --> 01:22:58,560
orion so it's it's going to take a

2257
01:23:01,270 --> 01:22:59,760
matter of time because there's a lot of

2258
01:23:04,470 --> 01:23:01,280
data that we'll be bringing down on a

2259
01:23:06,470 --> 01:23:04,480
continuous basis uh so it'll be after

2260
01:23:08,550 --> 01:23:06,480
somewhat after the event to get the real

2261
01:23:11,270 --> 01:23:08,560
high res but the intent also is to have

2262
01:23:13,270 --> 01:23:11,280
some streaming uh imagery throughout the

2263
01:23:15,110 --> 01:23:13,280

during these events as well

2264
01:23:17,189 --> 01:23:15,120
let's go to let's go to melissa real

2265
01:23:18,790 --> 01:23:17,199
quick so she wants to add a little bit

2266
01:23:21,350 --> 01:23:18,800
about what happens at the recovery phase

2267
01:23:23,030 --> 01:23:21,360
for imagery go ahead melissa

2268
01:23:25,189 --> 01:23:23,040
awesome thank you yes so we have about

2269
01:23:27,350 --> 01:23:25,199
17 cameras all over the ship in

2270
01:23:29,590 --> 01:23:27,360
helicopters in the open water

2271
01:23:31,189 --> 01:23:29,600
several of those are connected to

2272
01:23:33,590 --> 01:23:31,199
basically a satellite system that we

2273
01:23:36,070 --> 01:23:33,600
have on board that we will be able to

2274
01:23:39,350 --> 01:23:36,080
stream near real-time live video back to

2275
01:23:41,830 --> 01:23:39,360
johnson to be um sent over nasa tv so we

2276
01:23:44,070 --> 01:23:41,840
will you will be able to see um recovery

2277
01:23:46,149 --> 01:23:44,080
operations real time

2278
01:23:47,590 --> 01:23:46,159
very good let's also go to the phone

2279
01:23:49,590 --> 01:23:47,600
last one on the phone marcia dunn

2280
01:23:52,149 --> 01:23:49,600
associated press

2281
01:23:54,149 --> 01:23:52,159
yes hi um for read i was hoping you

2282
01:23:56,070 --> 01:23:54,159
could provide some details please on

2283
01:23:58,629 --> 01:23:56,080
what special traits or skills you're

2284
01:24:00,310 --> 01:23:58,639
looking for for the first two crews

2285
01:24:02,629 --> 01:24:00,320
and and will the first two crews come

2286
01:24:04,470 --> 01:24:02,639
from the 18 artemis team astronauts

2287
01:24:06,709 --> 01:24:04,480
announced announced a couple years back

2288
01:24:08,550 --> 01:24:06,719

or not necessarily because

2289
01:24:10,790 --> 01:24:08,560
today you seem to be indicating that any

2290
01:24:12,709 --> 01:24:10,800
of the 42 active astronauts could be in

2291
01:24:15,110 --> 01:24:12,719
the running at this point for artemis

2292
01:24:16,790 --> 01:24:15,120
two and three thanks so much

2293
01:24:19,270 --> 01:24:16,800
you bet marcia i'll start with the

2294
01:24:21,990 --> 01:24:19,280
second half which is um

2295
01:24:23,510 --> 01:24:22,000
the way i look at any any one of our 42

2296
01:24:25,510 --> 01:24:23,520
active astronauts is eligible for an

2297
01:24:28,390 --> 01:24:25,520
artemis mission we want to assemble the

2298
01:24:30,229 --> 01:24:28,400
the right team for this mission as for

2299
01:24:32,390 --> 01:24:30,239
what we're looking for in these first

2300
01:24:33,990 --> 01:24:32,400
few artemis missions but i would say

2301
01:24:35,910 --> 01:24:34,000
it's really what our astronaut core is

2302
01:24:38,310 --> 01:24:35,920
as a whole right now

2303
01:24:40,790 --> 01:24:38,320
first and foremost technical expertise

2304
01:24:42,310 --> 01:24:40,800
the ability to dive into literally any

2305
01:24:44,229 --> 01:24:42,320
situation

2306
01:24:45,910 --> 01:24:44,239
any technical need of the vehicle to

2307
01:24:47,270 --> 01:24:45,920
understand when things aren't going

2308
01:24:50,550 --> 01:24:47,280
quite right and to understand when they

2309
01:24:53,669 --> 01:24:50,560
are that is that is absolutely number

2310
01:24:55,270 --> 01:24:53,679
one uh and then beyond that it is are

2311
01:24:57,669 --> 01:24:55,280
you a team player

2312
01:24:59,910 --> 01:24:57,679
are you engaging can you work with our

2313
01:25:02,310 --> 01:24:59,920

flight directors that is exactly what

2314
01:25:04,790 --> 01:25:02,320
our astronaut corps is today we we pride

2315
01:25:05,830 --> 01:25:04,800
ourselves on long-duration space flight

2316
01:25:07,750 --> 01:25:05,840
six months to a year on the

2317
01:25:09,189 --> 01:25:07,760
international space station we pride

2318
01:25:10,390 --> 01:25:09,199
ourselves on

2319
01:25:12,390 --> 01:25:10,400
um

2320
01:25:14,390 --> 01:25:12,400
we call it expeditionary behavior uh of

2321
01:25:15,990 --> 01:25:14,400
being a good teammate of emptying the

2322
01:25:17,830 --> 01:25:16,000
trash can when it's full cleaning out

2323
01:25:19,669 --> 01:25:17,840
the dishwasher when your parents ask you

2324
01:25:20,790 --> 01:25:19,679
those sorts of things and that is really

2325
01:25:23,189 --> 01:25:20,800
what we're looking for in those first

2326
01:25:26,470 --> 01:25:23,199
artem's missions technical expertise

2327
01:25:28,390 --> 01:25:26,480
team player and and that's what we want

2328
01:25:30,870 --> 01:25:28,400
very good let's go back in the room

2329
01:25:33,830 --> 01:25:30,880
from meyer with ard german radio

2330
01:25:35,910 --> 01:25:33,840
television thank you for doing that um

2331
01:25:38,229 --> 01:25:35,920
i wondered if there are

2332
01:25:39,990 --> 01:25:38,239
since you made it clear that rms1 is

2333
01:25:43,590 --> 01:25:40,000
about collecting as much data as

2334
01:25:44,870 --> 01:25:43,600
possible are there any moments or points

2335
01:25:49,270 --> 01:25:44,880
throughout the mission where you're

2336
01:25:51,350 --> 01:25:49,280
gonna push the sls sls orion

2337
01:25:56,310 --> 01:25:51,360
closer to the limit than you would

2338
01:26:01,510 --> 01:25:57,830

i would say

2339
01:26:03,030 --> 01:26:01,520
probably not to any extreme events we

2340
01:26:04,950 --> 01:26:03,040
have you know most of our testing on the

2341
01:26:06,790 --> 01:26:04,960
ground covers those extreme corners so

2342
01:26:08,470 --> 01:26:06,800
when i talk about like parachute testing

2343
01:26:10,229 --> 01:26:08,480
a lot of parachute testing with a drogue

2344
01:26:11,669 --> 01:26:10,239
out or a main out what happens when that

2345
01:26:14,550 --> 01:26:11,679
happens so we try and catch the corners

2346
01:26:16,550 --> 01:26:14,560
of the boxes through our ground testing

2347
01:26:18,070 --> 01:26:16,560
so i think you know we're looking but we

2348
01:26:19,590 --> 01:26:18,080
use that ground testing to build models

2349
01:26:21,430 --> 01:26:19,600
on how the system's going to perform

2350
01:26:22,709 --> 01:26:21,440
across all environments so so really

2351
01:26:24,629 --> 01:26:22,719
during the mission we're capturing the

2352
01:26:27,590 --> 01:26:24,639
data what environment did we really fly

2353
01:26:28,950 --> 01:26:27,600
in and then um did that the response you

2354
01:26:30,390 --> 01:26:28,960
know in that environment did the thermal

2355
01:26:32,629 --> 01:26:30,400
and the pressures and the temperatures

2356
01:26:34,310 --> 01:26:32,639
or the the vibrations or whatever we're

2357
01:26:35,990 --> 01:26:34,320
collecting did it match the model

2358
01:26:37,510 --> 01:26:36,000
predictions that we have based on all of

2359
01:26:38,790 --> 01:26:37,520
our test data so

2360
01:26:40,310 --> 01:26:38,800
that's where i think we are i think

2361
01:26:41,510 --> 01:26:40,320
there probably are some operational

2362
01:26:43,189 --> 01:26:41,520
things that we'll be a little more

2363
01:26:45,189 --> 01:26:43,199

aggressive about because we don't have a

2364
01:26:47,270 --> 01:26:45,199
crew and our number one objective is to

2365
01:26:49,430 --> 01:26:47,280
get the heat shield data right so there

2366
01:26:50,629 --> 01:26:49,440
might be let's go for tli which we maybe

2367
01:26:52,149 --> 01:26:50,639
wouldn't have been the call if you had

2368
01:26:54,470 --> 01:26:52,159
crew on board but because that is our

2369
01:26:56,629 --> 01:26:54,480
primary objective absolutely you know we

2370
01:26:58,310 --> 01:26:56,639
might take a little more um i want to

2371
01:27:00,790 --> 01:26:58,320
say risk but you know a little more

2372
01:27:02,629 --> 01:27:00,800
flexibility there but i'll let that yeah

2373
01:27:05,110 --> 01:27:02,639
i think it's a good point

2374
01:27:06,709 --> 01:27:05,120
we established a philosophy on uh the

2375
01:27:09,430 --> 01:27:06,719
planning stages of this mission that we

2376
01:27:11,830 --> 01:27:09,440
would accept more risk so um

2377
01:27:13,350 --> 01:27:11,840
during the uh during the the leo phase

2378
01:27:15,910 --> 01:27:13,360
the low earth orbit phase before we do

2379
01:27:18,310 --> 01:27:15,920
that translunar injection if orion

2380
01:27:19,990 --> 01:27:18,320
sustained a failure that it rendered it

2381
01:27:22,310 --> 01:27:20,000
zero fault tolerant to being able to

2382
01:27:24,550 --> 01:27:22,320
recover safely recover and retrieve the

2383
01:27:25,430 --> 01:27:24,560
capsule uh we're going to lean forward

2384
01:27:27,510 --> 01:27:25,440
and we're going to press and we're going

2385
01:27:30,149 --> 01:27:27,520
to execute the translunar injection just

2386
01:27:31,590 --> 01:27:30,159
so we can achieve the number one mission

2387
01:27:32,709 --> 01:27:31,600
objective that getting that heat shield

2388
01:27:34,310 --> 01:27:32,719

data

2389
01:27:35,830 --> 01:27:34,320
while we get that we'll also be able to

2390
01:27:36,950 --> 01:27:35,840
pick up uh most of the other ones as

2391
01:27:39,830 --> 01:27:36,960
well we'll be able to operate the

2392
01:27:41,350 --> 01:27:39,840
vehicle in space we'll be able to

2393
01:27:43,270 --> 01:27:41,360
melissa and her team will be able to get

2394
01:27:45,110 --> 01:27:43,280
on site and recover it

2395
01:27:46,790 --> 01:27:45,120
you know because what we'll do is we'll

2396
01:27:48,950 --> 01:27:46,800
burn the translunar injection and then

2397
01:27:50,950 --> 01:27:48,960
we'll we'll select an early return

2398
01:27:52,950 --> 01:27:50,960
trajectory to bring orion back quickly

2399
01:27:54,709 --> 01:27:52,960
we won't make it to the moon uh we may

2400
01:27:56,950 --> 01:27:54,719
do a lunar flyby depending on the nature

2401
01:27:59,510 --> 01:27:56,960
of the failure um but

2402
01:28:01,990 --> 01:27:59,520
that is is so we can get that number one

2403
01:28:04,790 --> 01:28:02,000
priority uh objective and then safely

2404
01:28:05,750 --> 01:28:04,800
get the vehicle back and then on the sls

2405
01:28:07,910 --> 01:28:05,760
side

2406
01:28:10,070 --> 01:28:07,920
we don't have automatic aborts so we'll

2407
01:28:12,229 --> 01:28:10,080
have automatic aborts that uh for the

2408
01:28:13,590 --> 01:28:12,239
crude vehicle uh so they're all manual

2409
01:28:15,350 --> 01:28:13,600
boards at this point so that's we're

2410
01:28:16,950 --> 01:28:15,360
leaning forward and that that aspect for

2411
01:28:18,550 --> 01:28:16,960
the sls as well

2412
01:28:20,950 --> 01:28:18,560
and i guess one other item melissa may

2413
01:28:23,430 --> 01:28:20,960

want to jump in um after the re-entry

2414
01:28:25,030 --> 01:28:23,440
and splashdown uh you know she mentioned

2415
01:28:26,790 --> 01:28:25,040
that they have up to two hours from a

2416
01:28:28,070 --> 01:28:26,800
requirement standpoint to to get the

2417
01:28:29,910 --> 01:28:28,080
capsule and obviously think we're going

2418
01:28:31,669 --> 01:28:29,920
to beat that but i think on artemis one

2419
01:28:32,790 --> 01:28:31,679
we are doing leaving in the water for

2420
01:28:34,229 --> 01:28:32,800
two hours we're doing a thermal soak

2421
01:28:35,910 --> 01:28:34,239
back we want to understand what is that

2422
01:28:37,350 --> 01:28:35,920
thermal environment inside the capsule

2423
01:28:39,270 --> 01:28:37,360
when we finally have crew in there on

2424
01:28:40,390 --> 01:28:39,280
artemis ii did we predict correctly

2425
01:28:42,070 --> 01:28:40,400
because they're going to be in suits how

2426
01:28:44,310 --> 01:28:42,080
long can they stay in suits and stay

2427
01:28:46,870 --> 01:28:44,320
cooled so so in a case like that we are

2428
01:28:48,390 --> 01:28:46,880
pushing you know beyond what we expect

2429
01:28:52,390 --> 01:28:48,400
on the mission just to collect the data

2430
01:28:56,470 --> 01:28:54,550
yeah let's go ahead okay thanks uh joey

2431
01:28:57,830 --> 01:28:56,480
roulette with reuters um if i remember

2432
01:28:59,750 --> 01:28:57,840
correctly there's gonna be two

2433
01:29:01,270 --> 01:28:59,760
mannequins that are female and two that

2434
01:29:03,669 --> 01:29:01,280
are male on

2435
01:29:04,950 --> 01:29:03,679
artist one um and i guess this is for

2436
01:29:06,390 --> 01:29:04,960
debbie or reed is there a difference

2437
01:29:08,629 --> 01:29:06,400
between how

2438
01:29:11,350 --> 01:29:08,639

astronauts respond to radiation uh on

2439
01:29:14,070 --> 01:29:11,360
the on the capsule and if so how and

2440
01:29:15,510 --> 01:29:14,080
what um changes will you make to either

2441
01:29:17,110 --> 01:29:15,520
the spacecraft environment or the

2442
01:29:18,310 --> 01:29:17,120
spacesuit if you know depending on the

2443
01:29:20,709 --> 01:29:18,320
results

2444
01:29:21,910 --> 01:29:20,719
um so it was i think um and i'm not

2445
01:29:24,470 --> 01:29:21,920
fully up to speed on all the payloads

2446
01:29:26,470 --> 01:29:24,480
but there is one full mannequin called

2447
01:29:28,709 --> 01:29:26,480
munich and campos it was a naming

2448
01:29:29,910 --> 01:29:28,719
contest that happened several months ago

2449
01:29:32,870 --> 01:29:29,920
and then there's these two called

2450
01:29:34,070 --> 01:29:32,880
phantoms which are just torsos

2451
01:29:35,910 --> 01:29:34,080
one's gonna be wearing a radiation

2452
01:29:38,629 --> 01:29:35,920
protection vest and one is not so kind

2453
01:29:40,310 --> 01:29:38,639
of comparative um you know radiation

2454
01:29:41,350 --> 01:29:40,320
does affect women obviously differently

2455
01:29:42,790 --> 01:29:41,360
than men i don't know if there's

2456
01:29:44,070 --> 01:29:42,800
something else from the crew standpoint

2457
01:29:45,830 --> 01:29:44,080
you want to mention but that we're

2458
01:29:47,189 --> 01:29:45,840
collecting the data to understand did

2459
01:29:49,270 --> 01:29:47,199
the protection of the vehicle provide

2460
01:29:51,350 --> 01:29:49,280
what we expected so we

2461
01:29:53,030 --> 01:29:51,360
we used to have

2462
01:29:54,950 --> 01:29:53,040
i won't call them draconian but maybe i

2463
01:29:56,149 --> 01:29:54,960

said the word some some radiation limits

2464
01:29:57,910 --> 01:29:56,159
that were definitely different for men

2465
01:29:59,510 --> 01:29:57,920
and different for women and we have

2466
01:30:01,110 --> 01:29:59,520
worked very hard through our agency and

2467
01:30:03,270 --> 01:30:01,120
we've got some outstanding leadership at

2468
01:30:05,270 --> 01:30:03,280
headquarters right now uh and we have

2469
01:30:06,790 --> 01:30:05,280
equalized all radiation limits it does

2470
01:30:08,870 --> 01:30:06,800
not matter whether you're a man whether

2471
01:30:11,750 --> 01:30:08,880
you're a woman it is the exact same and

2472
01:30:13,750 --> 01:30:11,760
our end goal is uh you know the united

2473
01:30:16,070 --> 01:30:13,760
states of america is half man half women

2474
01:30:18,470 --> 01:30:16,080
well space should be at least that and

2475
01:30:19,669 --> 01:30:18,480
so if we cannot make these spacecraft

2476
01:30:21,830 --> 01:30:19,679
equitable

2477
01:30:23,510 --> 01:30:21,840
and we can't fly any type of person on

2478
01:30:25,910 --> 01:30:23,520
them then we need to look at our systems

2479
01:30:27,910 --> 01:30:25,920
and re-evaluate so from where we stand

2480
01:30:29,510 --> 01:30:27,920
there's absolutely no difference

2481
01:30:31,189 --> 01:30:29,520
all right last question

2482
01:30:33,590 --> 01:30:31,199
yeah scott johnson with space flight

2483
01:30:36,070 --> 01:30:33,600
insider

2484
01:30:38,310 --> 01:30:36,080
i think the rollout is about 13 days

2485
01:30:40,229 --> 01:30:38,320
away and then hopefully we have a launch

2486
01:30:43,110 --> 01:30:40,239
in about 24 days

2487
01:30:45,669 --> 01:30:43,120
uh are there currently any issues being

2488
01:30:48,709 --> 01:30:45,679

worked on the vehicle in the vab that

2489
01:30:51,030 --> 01:30:48,719
would affect either of those two dates

2490
01:30:52,950 --> 01:30:51,040
um i can speak from orion perspective um

2491
01:30:54,390 --> 01:30:52,960
the answer is no we're ready to go the

2492
01:30:55,750 --> 01:30:54,400
vehicle is powered down i think today

2493
01:30:58,470 --> 01:30:55,760
we're closing the hatches in a couple of

2494
01:30:59,750 --> 01:30:58,480
days um to prepare for roll out when it

2495
01:31:02,229 --> 01:30:59,760
gets out to the pad the hatches are

2496
01:31:04,390 --> 01:31:02,239
opened again for some other late load um

2497
01:31:05,590 --> 01:31:04,400
items but from an orion standpoint we

2498
01:31:07,110 --> 01:31:05,600
know we have some minor what they call

2499
01:31:09,350 --> 01:31:07,120
non-conformances when we process the

2500
01:31:10,709 --> 01:31:09,360
vehicle at kennedy but it's things like

2501
01:31:12,390 --> 01:31:10,719
you know touching up little paint or

2502
01:31:13,990 --> 01:31:12,400
things here so nothing right now on our

2503
01:31:16,950 --> 01:31:14,000
list that's withhold that's holding us

2504
01:31:19,030 --> 01:31:16,960
up we just completed our jsc center

2505
01:31:20,310 --> 01:31:19,040
director priya for our pre-flight

2506
01:31:21,830 --> 01:31:20,320
readiness review yesterday and

2507
01:31:23,350 --> 01:31:21,840
successfully passed that so we're good

2508
01:31:24,390 --> 01:31:23,360
to go i don't i can't speak for the

2509
01:31:26,229 --> 01:31:24,400
rocket i don't know if you guys have

2510
01:31:28,310 --> 01:31:26,239
more i'm not aware of any issues on the

2511
01:31:29,910 --> 01:31:28,320
rocket that they're working at this time

2512
01:31:34,470 --> 01:31:29,920
and we'll go to melissa to talk recovery

2513
01:31:37,189 --> 01:31:35,990

hey hey i was just going to comment on

2514
01:31:39,590 --> 01:31:37,199
the question you know i am here at

2515
01:31:41,270 --> 01:31:39,600
kennedy i do share a wall with um cliff

2516
01:31:42,790 --> 01:31:41,280
who is the

2517
01:31:44,790 --> 01:31:42,800
the one who's getting us ready to roll

2518
01:31:46,629 --> 01:31:44,800
out i could tell you that we at this

2519
01:31:48,149 --> 01:31:46,639
time are not working any show stoppers i

2520
01:31:50,149 --> 01:31:48,159
can't give you any technical details on

2521
01:31:51,750 --> 01:31:50,159
any of the non-conformance we have but

2522
01:31:54,229 --> 01:31:51,760
but we're looking pretty good right now

2523
01:31:56,070 --> 01:31:54,239
for holding both of those dates

2524
01:31:57,830 --> 01:31:56,080
excellent all right that'll wrap up our

2525
01:31:59,110 --> 01:31:57,840
time for questions thank you all for

2526
01:32:01,669 --> 01:31:59,120
submitting your questions and to our

2527
01:32:03,990 --> 01:32:01,679
briefers for uh taking the time

2528
01:32:06,470 --> 01:32:04,000
to do a detailed brief of the artemis

2529
01:32:09,830 --> 01:32:06,480
one mission uh you can follow more about

2530
01:32:11,669 --> 01:32:09,840
the mission.nasa.gov artemis-1

2531
01:32:13,189 --> 01:32:11,679
all these charts that you saw during

2532
01:32:14,629 --> 01:32:13,199
today's briefing will be available

2533
01:32:15,830 --> 01:32:14,639
online so we can point you in the

2534
01:32:17,350 --> 01:32:15,840
direction if you're interested in those

2535
01:32:30,230 --> 01:32:17,360
thanks again for joining us that will

2536
01:32:30,240 --> 01:32:47,110
[Music]

2537
01:33:01,990 --> 01:32:48,149
two

2538
01:33:02,000 --> 01:33:07,290

trajectory