

A woman with short brown hair and glasses, wearing a purple patterned blouse, is looking upwards in an office. The office has a drop ceiling with fluorescent lights and several small American flags on desks in the background.

Cathy Bupane
Mission Support
Cake Simulation Supervisor

1
00:00:13,990 --> 00:00:11,190
you go you're gonna go right down to

2
00:00:15,430 --> 00:00:14,000
zero boom the thing launches right yeah

3
00:00:16,790 --> 00:00:15,440
and then you go you'll take it you'll

4
00:00:18,630 --> 00:00:16,800
you know then the engines will cut after

5
00:00:20,950 --> 00:00:18,640
eight and a half minutes and either

6
00:00:22,390 --> 00:00:20,960
you're in orbit or today you mean on the

7
00:00:24,630 --> 00:00:22,400
real day you'll probably be in orbit

8
00:00:26,150 --> 00:00:24,640
after those eight minutes yes and then

9
00:00:28,230 --> 00:00:26,160
uh but if

10
00:00:30,550 --> 00:00:28,240
but what will happen today is probably

11
00:00:31,830 --> 00:00:30,560
not that on all the runs right probably

12
00:00:34,790 --> 00:00:31,840
not you know there's probably a good

13
00:00:36,549 --> 00:00:34,800

spread uh you know i'd say we practice a

14

00:00:38,470 --> 00:00:36,559

transatlantic abort landing we'll

15

00:00:39,670 --> 00:00:38,480

practice probably an rtls return to

16

00:00:42,549 --> 00:00:39,680

launch site

17

00:00:43,670 --> 00:00:42,559

we'll practice uh an abort to orbit

18

00:00:45,510 --> 00:00:43,680

there's a whole bunch of different

19

00:00:47,270 --> 00:00:45,520

flavors you know accent you got all

20

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

these different you know

21

00:00:51,670 --> 00:00:49,520

tangents that you can take yeah it's

22

00:00:53,670 --> 00:00:51,680

just uh all these different options and

23

00:00:56,229 --> 00:00:53,680

you gotta you know pick the the best

24

00:00:57,029 --> 00:00:56,239

option sometimes the best option isn't

25

00:01:00,229 --> 00:00:57,039

fun

26

00:01:01,830 --> 00:01:00,239

but it's the safest option at the time

27

00:01:04,070 --> 00:01:01,840

what do you what do you get out of these

28

00:01:06,950 --> 00:01:04,080

sims i mean because obviously you i mean

29

00:01:08,310 --> 00:01:06,960

you may i mean it might be that you're

30

00:01:09,510 --> 00:01:08,320

going to get a

31

00:01:11,990 --> 00:01:09,520

you might have to you might have to do

32

00:01:13,270 --> 00:01:12,000

one of these aborts for real but but

33

00:01:14,789 --> 00:01:13,280

you're getting more than that and it's

34

00:01:16,149 --> 00:01:14,799

not just practicing your board right

35

00:01:18,390 --> 00:01:16,159

what do you look to get out of your team

36

00:01:19,109 --> 00:01:18,400

today as the flight director

37

00:01:20,710 --> 00:01:19,119

you know

38

00:01:22,950 --> 00:01:20,720

i've been working with a lot of these

39

00:01:24,950 --> 00:01:22,960

guys for years now so i pretty much they

40

00:01:26,469 --> 00:01:24,960

know me i know them you have any ritual

41

00:01:27,749 --> 00:01:26,479

you'll do on that date no is there

42

00:01:30,069 --> 00:01:27,759

anything you have certain for breakfast

43

00:01:32,310 --> 00:01:30,079

or uh you know what you're gonna i i do

44

00:01:33,910 --> 00:01:32,320

wear a certain tie or anything the the

45

00:01:35,429 --> 00:01:33,920

tie um

46

00:01:37,030 --> 00:01:35,439

i'll figure that out i'm gonna have a

47

00:01:38,789 --> 00:01:37,040

nice tie you know

48

00:01:40,390 --> 00:01:38,799

um the nice one today thank you very

49

00:01:43,350 --> 00:01:40,400

very much appreciate that

50

00:01:45,350 --> 00:01:43,360

um but what i'll do is uh

51
00:01:47,270 --> 00:01:45,360
it's just uh you know the drive in just

52
00:01:49,030 --> 00:01:47,280
kind of get my my thoughts together

53
00:01:50,950 --> 00:01:49,040
that's that's kind of when i put stuff

54
00:01:54,950 --> 00:01:50,960
together and i always have listen to

55
00:01:58,630 --> 00:01:56,950
yeah sometimes it just depends on the

56
00:02:00,630 --> 00:01:58,640
morning but yeah usually i have a you

57
00:02:01,830 --> 00:02:00,640
know a diet coke or something i gotta

58
00:02:03,030 --> 00:02:01,840
get the diet

59
00:02:04,389 --> 00:02:03,040
so you know

60
00:02:05,749 --> 00:02:04,399
that's about the biggest ritual but

61
00:02:07,670 --> 00:02:05,759
that's every day all right how are you

62
00:02:09,669 --> 00:02:07,680
doing good good to see you man jim how

63
00:02:11,510 --> 00:02:09,679

you doing

64

00:02:13,750 --> 00:02:11,520

so where's your tie

65

00:02:15,910 --> 00:02:13,760

i only wear it on special occasions

66

00:02:18,229 --> 00:02:15,920

since i don't i don't usually dress up

67

00:02:19,910 --> 00:02:18,239

much yeah you got to save it just for

68

00:02:20,869 --> 00:02:19,920

the right time otherwise it's not

69

00:02:23,350 --> 00:02:20,879

special

70

00:02:24,869 --> 00:02:23,360

you know that's a good point yeah

71

00:02:26,790 --> 00:02:24,879

he looks the same way every time every

72

00:02:28,630 --> 00:02:26,800

day you know where your game jersey on

73

00:02:29,589 --> 00:02:28,640

uh on when you're practicing in the mud

74

00:02:31,190 --> 00:02:29,599

that's right

75

00:02:33,030 --> 00:02:31,200

he's got a good point there i get dirty

76

00:02:34,790 --> 00:02:33,040

i roll my sleeves up i get ready that's

77

00:02:36,630 --> 00:02:34,800

right i get ready to go that's right all

78

00:02:37,350 --> 00:02:36,640

right well we don't want to distract you

79

00:02:38,790 --> 00:02:37,360

what are you doing you're going to

80

00:02:40,949 --> 00:02:38,800

you're going to sign in yeah just

81

00:02:42,550 --> 00:02:40,959

getting everything set all right so we

82

00:02:45,110 --> 00:02:42,560

are getting ready for the asset sim this

83

00:02:46,070 --> 00:02:45,120

morning our fourth one with the 133 crew

84

00:02:46,949 --> 00:02:46,080

all right

85

00:02:48,550 --> 00:02:46,959

and what do you what are you guys going

86

00:02:50,550 --> 00:02:48,560

to be doing during this

87

00:02:53,430 --> 00:02:50,560

dub your ground control here's the thing

88

00:02:54,869 --> 00:02:53,440

right it says ground control

89

00:02:56,550 --> 00:02:54,879

controllers are responsible for the

90

00:02:58,470 --> 00:02:56,560

building itself making sure that

91

00:03:00,550 --> 00:02:58,480

everything is operating so that the rest

92

00:03:02,149 --> 00:03:00,560

of the team can get telemetry into the

93

00:03:04,390 --> 00:03:02,159

building we can get commands up to the

94

00:03:06,869 --> 00:03:04,400

arbiter also coordinating with the

95

00:03:08,550 --> 00:03:06,879

network in this case a simulated network

96

00:03:10,070 --> 00:03:08,560

that's generated by a model over in

97

00:03:11,589 --> 00:03:10,080

building 5 with where the other

98

00:03:14,070 --> 00:03:11,599

simulators are

99

00:03:16,229 --> 00:03:14,080

and our job is to make sure we have

100

00:03:18,390 --> 00:03:16,239

telemetry command and voice capability

101
00:03:20,149 --> 00:03:18,400
with the arbiter whatever that breaks

102
00:03:22,070 --> 00:03:20,159
which we're expecting to happen several

103
00:03:24,149 --> 00:03:22,080
times this morning okay then we've got

104
00:03:25,990 --> 00:03:24,159
to work with the team to restore it as

105
00:03:27,670 --> 00:03:26,000
quickly as possible all right and then

106
00:03:29,509 --> 00:03:27,680
it's saying one uh same thing during the

107
00:03:31,430 --> 00:03:29,519
flight safely

108
00:03:33,670 --> 00:03:31,440
tell us your name what are you doing uh

109
00:03:35,589 --> 00:03:33,680
i am mark mcdonald my name is margaret

110
00:03:39,110 --> 00:03:35,599
mcdonald and that's the spider this is

111
00:03:42,309 --> 00:03:40,710
did you go to boston you went to boston

112
00:03:44,070 --> 00:03:42,319
university i did that's pretty cool

113
00:03:45,350 --> 00:03:44,080

because most people go to texas to texas

114

00:03:46,550 --> 00:03:45,360

a m around there's a lot of those yeah

115

00:03:47,830 --> 00:03:46,560

yeah

116

00:03:49,990 --> 00:03:47,840

and i went to colorado you went to

117

00:03:52,070 --> 00:03:50,000

colorado along with our guidance officer

118

00:03:54,070 --> 00:03:52,080

really with the colorado too this is

119

00:03:55,190 --> 00:03:54,080

their it's the buff trench so this is

120

00:03:59,190 --> 00:03:55,200

like the 9th

121

00:04:01,990 --> 00:04:00,149

we are we don't nebraska know what he

122

00:04:03,030 --> 00:04:02,000

talked about the buff trench was that

123

00:04:04,949 --> 00:04:03,040

the bus

124

00:04:06,869 --> 00:04:04,959

hello i see but you grew up in that

125

00:04:09,270 --> 00:04:06,879

nebraska colorado river

126

00:04:10,630 --> 00:04:09,280

see i'm from new york i have no idea

127

00:04:12,229 --> 00:04:10,640

because we just have fights between

128

00:04:13,350 --> 00:04:12,239

families all right so uh what do we got

129

00:04:14,949 --> 00:04:13,360

what do we got going here what are you

130

00:04:16,390 --> 00:04:14,959

doing right now which what's going to be

131

00:04:18,310 --> 00:04:16,400

your job this morning uh what we

132

00:04:20,469 --> 00:04:18,320

typically do both pre-launch and

133

00:04:23,830 --> 00:04:20,479

pre-simulation as we get the uh the

134

00:04:26,550 --> 00:04:23,840

targets guidance targets uh ready for

135

00:04:28,390 --> 00:04:26,560

launch based on the station state vector

136

00:04:30,230 --> 00:04:28,400

okay so uh

137

00:04:31,270 --> 00:04:30,240

and then that's called the i wise so

138

00:04:34,070 --> 00:04:31,280

that's where the shuttle is going to

139

00:04:35,590 --> 00:04:34,080

steer too okay um so by target you mean

140

00:04:37,830 --> 00:04:35,600

like where you want to put the space

141

00:04:40,230 --> 00:04:37,840

shuttle so that it can correct hit the

142

00:04:41,909 --> 00:04:40,240

uh the space station correct so we're

143

00:04:43,830 --> 00:04:41,919

setting it up to ronnie on flight day

144

00:04:45,030 --> 00:04:43,840

three okay but you already know that

145

00:04:46,629 --> 00:04:45,040

right i mean you've figured this out for

146

00:04:47,909 --> 00:04:46,639

for years right i mean uh for a long

147

00:04:49,430 --> 00:04:47,919

time i mean you know where the station's

148

00:04:50,710 --> 00:04:49,440

gonna be right but is this something it

149

00:04:52,150 --> 00:04:50,720

might be a little bit you gotta it might

150

00:04:54,070 --> 00:04:52,160

be different today or is it gonna be

151

00:04:55,030 --> 00:04:54,080

different altitude will vary flight to

152

00:04:57,590 --> 00:04:55,040

flight

153

00:04:59,830 --> 00:04:57,600

and our uh topo officers keep track of

154

00:05:02,310 --> 00:04:59,840

that uh very closely they have to telpo

155

00:05:04,070 --> 00:05:02,320

what does that stand for that's uh

156

00:05:05,909 --> 00:05:04,080

operations thank you thank you

157

00:05:08,070 --> 00:05:05,919

operations officer that's the trajectory

158

00:05:10,469 --> 00:05:08,080

person on the station side

159

00:05:13,830 --> 00:05:10,479

i'm the fido lackey basically

160

00:05:15,110 --> 00:05:13,840

i provide things like that and coffee

161

00:05:16,550 --> 00:05:15,120

and of course they're having to maintain

162

00:05:18,629 --> 00:05:16,560

a trajectory in coordination with the

163

00:05:20,790 --> 00:05:18,639

russians and other uh partners to make

164

00:05:22,390 --> 00:05:20,800

sure that all the visiting vehicles are

165

00:05:23,510 --> 00:05:22,400

going to be able to rendezvous

166

00:05:25,510 --> 00:05:23,520

given their their performance

167

00:05:27,430 --> 00:05:25,520

capabilities in relation to the what's

168

00:05:29,430 --> 00:05:27,440

that what's that tell you mom that's a

169

00:05:30,550 --> 00:05:29,440

ring behind me

170

00:05:33,110 --> 00:05:30,560

mom i'm right in the middle of something

171

00:05:34,310 --> 00:05:33,120

all right tell me you're busy

172

00:05:35,670 --> 00:05:34,320

all right so

173

00:05:41,749 --> 00:05:35,680

you really didn't that's how you picked

174

00:05:45,990 --> 00:05:43,430

all right so we've got we've got brian

175

00:05:47,270 --> 00:05:46,000

lenny here you're a flight director good

176

00:05:48,790 --> 00:05:47,280

morning brian thanks for that you're

177

00:05:50,550 --> 00:05:48,800

very busy but we appreciate you taking a

178

00:05:52,790 --> 00:05:50,560

break glad to be here and you you're a

179

00:05:54,950 --> 00:05:52,800

flight director you've done uh

180

00:05:57,350 --> 00:05:54,960

you've done shuttle station

181

00:05:58,390 --> 00:05:57,360

you're also acid is that right okay if

182

00:05:59,749 --> 00:05:58,400

you can tell us what's going on back

183

00:06:01,110 --> 00:05:59,759

here so for each front row person

184

00:06:02,629 --> 00:06:01,120

there's usually a couple of back room

185

00:06:04,790 --> 00:06:02,639

people helping them out the back room

186

00:06:06,230 --> 00:06:04,800

position usually is a smaller piece of

187

00:06:08,309 --> 00:06:06,240

the front room position so that that

188

00:06:10,230 --> 00:06:08,319

individual can come in from college or

189

00:06:11,830 --> 00:06:10,240

whatever newer guy and learn that

190

00:06:13,590 --> 00:06:11,840

smaller piece learn the other smaller

191

00:06:15,830 --> 00:06:13,600

piece then move out to the front room

192

00:06:17,430 --> 00:06:15,840

right here we have the flight flight

193

00:06:19,029 --> 00:06:17,440

room yes sir

194

00:06:20,390 --> 00:06:19,039

mission control

195

00:06:22,390 --> 00:06:20,400

in the back rooms we have the flight

196

00:06:24,070 --> 00:06:22,400

dynamics mipser multi-purpose support

197

00:06:25,430 --> 00:06:24,080

room we call them okay and these folks

198

00:06:27,670 --> 00:06:25,440

are supporting the flight dynamics and

199

00:06:29,590 --> 00:06:27,680

the guidance and procedures officer here

200

00:06:31,350 --> 00:06:29,600

we have our navigation folks helping us

201
00:06:33,749 --> 00:06:31,360
figure out where we're at which is an

202
00:06:35,189 --> 00:06:33,759
important function we think right

203
00:06:36,390 --> 00:06:35,199
so these guys help us determine where

204
00:06:38,790 --> 00:06:36,400
we're at so that we know where we need

205
00:06:40,790 --> 00:06:38,800
to go that's good here we have dynamics

206
00:06:43,189 --> 00:06:40,800
folks okay they feed into who who are

207
00:06:45,350 --> 00:06:43,199
they fido flight dynamics officer okay

208
00:06:47,590 --> 00:06:45,360
guys the two guys down front okay that's

209
00:06:49,110 --> 00:06:47,600
so all these folks back here

210
00:06:51,270 --> 00:06:49,120
feed into those

211
00:06:53,110 --> 00:06:51,280
two positions in front most disciplines

212
00:06:54,950 --> 00:06:53,120
the systems disciplines will have one or

213
00:06:56,870 --> 00:06:54,960

two guys in the back room okay flight

214

00:06:58,070 --> 00:06:56,880

dynamics has a whole lot more it could

215

00:06:59,830 --> 00:06:58,080

because there's a whole lot more going

216

00:07:01,990 --> 00:06:59,840

on at those consoles and what they're

217

00:07:04,309 --> 00:07:02,000

supporting and plus it's only for ascent

218

00:07:05,990 --> 00:07:04,319

and entry that they do that and but why

219

00:07:07,510 --> 00:07:06,000

why is this so important during asset

220

00:07:09,189 --> 00:07:07,520

why is this uh

221

00:07:10,710 --> 00:07:09,199

obvious it's so dynamic yeah you got

222

00:07:12,790 --> 00:07:10,720

your three main engines driving you got

223

00:07:14,469 --> 00:07:12,800

your two big srbs driving and the

224

00:07:16,070 --> 00:07:14,479

vehicle's going uh hopefully in the

225

00:07:17,510 --> 00:07:16,080

right direction of course and they're

226
00:07:18,950 --> 00:07:17,520
monitoring the performance to be sure

227
00:07:20,629 --> 00:07:18,960
that we hit our mico targets at the

228
00:07:22,469 --> 00:07:20,639
right time and if you don't hit your

229
00:07:24,550 --> 00:07:22,479
miko target your ball engine cutoff

230
00:07:26,870 --> 00:07:24,560
sorry main engine cut off targets your

231
00:07:28,309 --> 00:07:26,880
velocity your glide path angle

232
00:07:29,430 --> 00:07:28,319
a couple other important parameters to

233
00:07:30,710 --> 00:07:29,440
make sure that

234
00:07:32,309 --> 00:07:30,720
you're going in the right direction in

235
00:07:34,150 --> 00:07:32,319
order to get the station if you don't do

236
00:07:35,510 --> 00:07:34,160
that correctly you may not even get to

237
00:07:36,870 --> 00:07:35,520
orbit right and what did what can they

238
00:07:37,990 --> 00:07:36,880

control because they could you know when

239

00:07:39,350 --> 00:07:38,000

you're inside the shuttle and the thing

240

00:07:40,550 --> 00:07:39,360

goes it's kind of like well this thing's

241

00:07:42,469 --> 00:07:40,560

on its way and we're going wherever we

242

00:07:44,070 --> 00:07:42,479

want but they can actually uh adjust

243

00:07:46,070 --> 00:07:44,080

what's going on while we're sitting here

244

00:07:48,230 --> 00:07:46,080

taking our ride they will ask the pilot

245

00:07:50,309 --> 00:07:48,240

to adjust for example a throttle setting

246

00:07:52,230 --> 00:07:50,319

okay change how fast the the throttles

247

00:07:54,390 --> 00:07:52,240

engines throttle up from 104 percent

248

00:07:56,309 --> 00:07:54,400

down to 66 percent for example or

249

00:07:57,909 --> 00:07:56,319

whatever they need to do okay sometimes

250

00:07:59,990 --> 00:07:57,919

you go to max throttles for certain main

251
00:08:01,990 --> 00:08:00,000
engine out cases in contingency abort

252
00:08:03,270 --> 00:08:02,000
cases right um one of the

253
00:08:04,309 --> 00:08:03,280
counter-intuitive things they'll ask you

254
00:08:06,469 --> 00:08:04,319
to do is

255
00:08:08,469 --> 00:08:06,479
throttle back so you can burn longer for

256
00:08:10,230 --> 00:08:08,479
towel targets which always makes people

257
00:08:11,909 --> 00:08:10,240
confuse going over the ocean if we

258
00:08:14,070 --> 00:08:11,919
measure there yes if we lose an engine

259
00:08:16,070 --> 00:08:14,080
early we end up going over lane aiming

260
00:08:17,990 --> 00:08:16,080
for landing in europe they'll ask them

261
00:08:19,749 --> 00:08:18,000
to throttle back so that we can go

262
00:08:21,909 --> 00:08:19,759
longer

263
00:08:23,589 --> 00:08:21,919

yeah it sort of helps us it helps the

264

00:08:25,430 --> 00:08:23,599

miko targets again the main engine cut

265

00:08:26,950 --> 00:08:25,440

off targets okay so on this side of the

266

00:08:28,230 --> 00:08:26,960

back that's what we got here you have

267

00:08:30,950 --> 00:08:28,240

the uh

268

00:08:31,990 --> 00:08:30,960

the system for the systems uh background

269

00:08:33,750 --> 00:08:32,000

personnel

270

00:08:35,909 --> 00:08:33,760

and uh for example right here we have

271

00:08:37,670 --> 00:08:35,919

the computer folks the

272

00:08:39,990 --> 00:08:37,680

data processing system

273

00:08:42,469 --> 00:08:40,000

uh supporting the the dps officer up

274

00:08:43,670 --> 00:08:42,479

front we have the enco back room who

275

00:08:45,509 --> 00:08:43,680

take care of the communications

276
00:08:47,110 --> 00:08:45,519
instrumentation on board okay making

277
00:08:48,150 --> 00:08:47,120
sure the s-band and the tdrs and the

278
00:08:49,670 --> 00:08:48,160
ground and

279
00:08:51,509 --> 00:08:49,680
talking to the myla crown sites are

280
00:08:53,190 --> 00:08:51,519
working well

281
00:08:55,509 --> 00:08:53,200
over on the far end you have the max

282
00:08:57,350 --> 00:08:55,519
mechanical focus taking care of all the

283
00:08:59,750 --> 00:08:57,360
mechanical devices on board the vent

284
00:09:01,110 --> 00:08:59,760
doors the landing gear all those big

285
00:09:03,190 --> 00:09:01,120
things like that

286
00:09:04,790 --> 00:09:03,200
and then the electrical folks are

287
00:09:06,150 --> 00:09:04,800
kind of in between there eagles

288
00:09:08,230 --> 00:09:06,160

supporting eagle they took care of the

289

00:09:09,509 --> 00:09:08,240

electro electrical fuel cells and

290

00:09:11,509 --> 00:09:09,519

distribution of electricity throughout

291

00:09:14,310 --> 00:09:11,519

the vehicle then the life support guys

292

00:09:16,070 --> 00:09:14,320

and the thermal guys support the ecom

293

00:09:18,150 --> 00:09:16,080

they take care of of course life support

294

00:09:19,829 --> 00:09:18,160

make sure the cabin air is good and the

295

00:09:21,750 --> 00:09:19,839

thermal make sure we're doing cooling on

296

00:09:23,190 --> 00:09:21,760

the vehicle of course the inside of the

297

00:09:24,870 --> 00:09:23,200

vehicle you generate a tremendous amount

298

00:09:25,990 --> 00:09:24,880

of heat from all the computers that are

299

00:09:27,990 --> 00:09:26,000

turned on

300

00:09:29,269 --> 00:09:28,000

so we can have water loops and frame

301
00:09:33,430 --> 00:09:29,279
loops that pull that heat out of the

302
00:09:37,750 --> 00:09:35,670
and also through the fence all right

303
00:09:39,750 --> 00:09:37,760
then over here we slap evacuate a flap

304
00:09:42,230 --> 00:09:39,760
evaporator memory system all right

305
00:09:43,910 --> 00:09:42,240
acronyms okay acronyms

306
00:09:45,430 --> 00:09:43,920
guidance navigation control this is the

307
00:09:47,269 --> 00:09:45,440
back room that makes sure they can

308
00:09:49,509 --> 00:09:47,279
control the vehicle we've got sensors

309
00:09:51,110 --> 00:09:49,519
and controls takes both so they're sort

310
00:09:52,870 --> 00:09:51,120
of the steering wheel if you will of the

311
00:09:54,150 --> 00:09:52,880
vehicle for a car

312
00:09:56,230 --> 00:09:54,160
and then on the far side you have the

313
00:09:57,430 --> 00:09:56,240

propulsion guys and the booster guys the

314

00:09:59,110 --> 00:09:57,440

prop guys

315

00:10:00,790 --> 00:09:59,120

do the ohms rcs which are the small

316

00:10:02,069 --> 00:10:00,800

rocket engines you don't see during

317

00:10:04,230 --> 00:10:02,079

launch

318

00:10:05,670 --> 00:10:04,240

but you do use during entry to the left

319

00:10:07,269 --> 00:10:05,680

of them is the booster mat back room

320

00:10:09,350 --> 00:10:07,279

that does the main engines that are the

321

00:10:11,509 --> 00:10:09,360

big rocket engines we see at launch

322

00:10:13,910 --> 00:10:11,519

so again the same idea take one

323

00:10:15,590 --> 00:10:13,920

discipline one systems guy out front and

324

00:10:17,670 --> 00:10:15,600

break his system up in a couple of small

325

00:10:19,750 --> 00:10:17,680

pieces and then divvy it up here in the

326

00:10:21,430 --> 00:10:19,760

back room for someone to specialize in

327

00:10:23,190 --> 00:10:21,440

so they can learn that discipline and

328

00:10:25,829 --> 00:10:23,200

then train them to help you out during

329

00:10:27,110 --> 00:10:25,839

the during the flight who made the cake

330

00:10:29,829 --> 00:10:27,120

you make the cake

331

00:10:32,310 --> 00:10:29,839

what's your name kathy b paint cathy

332

00:10:33,110 --> 00:10:32,320

what's your last name view pain

333

00:10:34,949 --> 00:10:33,120

uh-huh

334

00:10:37,269 --> 00:10:34,959

and you make every one of these cakes i

335

00:10:39,190 --> 00:10:37,279

do indeed i do i do every mission this

336

00:10:41,430 --> 00:10:39,200

is the special launch cake

337

00:10:43,269 --> 00:10:41,440

which is the carrot cake yes we've only

338

00:10:44,870 --> 00:10:43,279

changed it a couple times and they don't

339

00:10:46,069 --> 00:10:44,880

like it when we change it all right so

340

00:10:47,910 --> 00:10:46,079

this is why it is one of the reasons you

341

00:10:49,590 --> 00:10:47,920

simulate you have a simulation as well

342

00:10:51,110 --> 00:10:49,600

let's make sure everybody likes a cake

343

00:10:52,389 --> 00:10:51,120

yeah it's kind of a simple well we

344

00:10:53,910 --> 00:10:52,399

haven't had a mission in quite a while

345

00:10:55,670 --> 00:10:53,920

so i sim them every once in a while and

346

00:10:57,110 --> 00:10:55,680

i've discovered i have a thermal issue

347

00:10:58,710 --> 00:10:57,120

with my uh

348

00:11:00,710 --> 00:10:58,720

with my oven so it'll have to be fixed

349

00:11:02,389 --> 00:11:00,720

before we go to launch

350

00:11:03,910 --> 00:11:02,399

that's why we simulate it's not just to

351
00:11:05,110 --> 00:11:03,920
make sure that we know what we're doing

352
00:11:07,030 --> 00:11:05,120
with the space shuttles that you get the

353
00:11:08,870 --> 00:11:07,040
cake rice that's right and you can make

354
00:11:09,829 --> 00:11:08,880
changes you can adapt to the chicken all

355
00:11:11,590 --> 00:11:09,839
right so

356
00:11:12,630 --> 00:11:11,600
so they can't fly without my cake all

357
00:11:15,269 --> 00:11:12,640
right what else did you do here beside

358
00:11:16,790 --> 00:11:15,279
the cake though i used to be a tao i

359
00:11:18,949 --> 00:11:16,800
used to sit down the trajectory

360
00:11:20,870 --> 00:11:18,959
applications officer would manage the

361
00:11:22,310 --> 00:11:20,880
server that uh

362
00:11:24,949 --> 00:11:22,320
produces the trajectory during the

363
00:11:26,550 --> 00:11:24,959

flight but now i work for fdoc and so i

364

00:11:28,470 --> 00:11:26,560

think outside

365

00:11:30,710 --> 00:11:28,480

but what does yeah it's a new contract

366

00:11:33,110 --> 00:11:30,720

so i do mostly sustaining work and uh

367

00:11:35,110 --> 00:11:33,120

contract paperwork okay and and the

368

00:11:36,870 --> 00:11:35,120

cakes and the cake well yeah i come to

369

00:11:39,350 --> 00:11:36,880

do support for mission so i support the

370

00:11:41,110 --> 00:11:39,360

three primary phases so okay so it's the

371

00:11:43,590 --> 00:11:41,120

carrot cake for us

372

00:11:45,430 --> 00:11:43,600

there's a coffee cake for a rendezvous

373

00:11:46,550 --> 00:11:45,440

and there's a chocolate cherry cake for

374

00:11:48,389 --> 00:11:46,560

landing

375

00:11:52,470 --> 00:11:48,399

that's the final dc turn around for run

376

00:11:55,350 --> 00:11:52,480

number uh three colors

377

00:11:57,670 --> 00:11:55,360

all right so how'd it go wow that was a

378

00:11:58,870 --> 00:11:57,680

that was probably the oddest rtls i've

379

00:12:01,509 --> 00:11:58,880

ever seen i don't know if you guys saw

380

00:12:03,190 --> 00:12:01,519

the trajectory up front but uh we've i

381

00:12:04,310 --> 00:12:03,200

don't think we got any film of it but uh

382

00:12:05,430 --> 00:12:04,320

we can see a little bit over here can

383

00:12:07,430 --> 00:12:05,440

you see it what are we seeing here

384

00:12:09,509 --> 00:12:07,440

that's just the uh that's the nominal

385

00:12:13,030 --> 00:12:09,519

part that the the crew had to take

386

00:12:15,269 --> 00:12:13,040

manual control to overcome an engine out

387

00:12:16,870 --> 00:12:15,279

that was not recognized and

388

00:12:18,470 --> 00:12:16,880

uh gosh the

389

00:12:20,710 --> 00:12:18,480

it was it was a rough one but uh

390

00:12:22,710 --> 00:12:20,720

successful but you made it back yeah

391

00:12:23,509 --> 00:12:22,720

from the same perspective

392

00:12:25,910 --> 00:12:23,519

yes

393

00:12:27,910 --> 00:12:25,920

i am the acid entry econ for 133 okay

394

00:12:30,069 --> 00:12:27,920

which means what which means that i work

395

00:12:31,670 --> 00:12:30,079

launch and landing and i take care of

396

00:12:33,829 --> 00:12:31,680

all the environmental control systems

397

00:12:35,350 --> 00:12:33,839

from the shadows

398

00:12:36,389 --> 00:12:35,360

the air they breathe their temperature

399

00:12:38,470 --> 00:12:36,399

control

400

00:12:41,509 --> 00:12:38,480

the water they drink all the good stuff

401
00:12:46,389 --> 00:12:43,990
and uh what happened you've had two

402
00:12:48,150 --> 00:12:46,399
you've had this is a sim day simulation

403
00:12:50,230 --> 00:12:48,160
day morning

404
00:12:51,670 --> 00:12:50,240
but you can fit a few different runs of

405
00:12:53,430 --> 00:12:51,680
simulations in those four hours so

406
00:12:55,269 --> 00:12:53,440
you've had two so far how's it going so

407
00:12:57,430 --> 00:12:55,279
far um so far it's been pretty good we

408
00:12:58,629 --> 00:12:57,440
had a cabin leak the first run that we

409
00:13:00,150 --> 00:12:58,639
were able to i was coming out of the

410
00:13:01,990 --> 00:13:00,160
cabin all right you're able to stop it

411
00:13:03,509 --> 00:13:02,000
yeah it turned out it was in the airlock

412
00:13:05,110 --> 00:13:03,519
so thank goodness we were able to stop

413
00:13:06,870 --> 00:13:05,120

it well then you can't use the airlock

414

00:13:09,509 --> 00:13:06,880

right okay well it depends on the leak

415

00:13:10,870 --> 00:13:09,519

size if you can give it some consumables

416

00:13:12,629 --> 00:13:10,880

on board to be able to feed the lake

417

00:13:14,230 --> 00:13:12,639

then sometimes you can reopen the

418

00:13:15,670 --> 00:13:14,240

airlock just to get certain things out

419

00:13:16,870 --> 00:13:15,680

and then close it back up tight okay

420

00:13:18,069 --> 00:13:16,880

because you need that for the tunnel to

421

00:13:19,750 --> 00:13:18,079

get to the space station don't you

422

00:13:21,750 --> 00:13:19,760

exactly if you dock that could be an

423

00:13:24,069 --> 00:13:21,760

issue okay so you'd have if this was a

424

00:13:25,670 --> 00:13:24,079

real problem you'd be figuring out

425

00:13:27,509 --> 00:13:25,680

whether or not you could if we had

426
00:13:29,350 --> 00:13:27,519
enough gas on board to be able to feed

427
00:13:30,710 --> 00:13:29,360
the leak yeah and get things out and we

428
00:13:32,310 --> 00:13:30,720
have to go in there anyway and get out

429
00:13:34,389 --> 00:13:32,320
the suits because you don't want the

430
00:13:35,910 --> 00:13:34,399
suit the eva suits to get down to vacuum

431
00:13:37,350 --> 00:13:35,920
because that can decertify them so we

432
00:13:39,829 --> 00:13:37,360
got to go in there and pull those things

433
00:13:40,790 --> 00:13:39,839
out and close it all back up all right

434
00:13:42,470 --> 00:13:40,800
all right but you found out where the

435
00:13:44,629 --> 00:13:42,480
leak was did you end up stopping it then

436
00:13:46,069 --> 00:13:44,639
or no yeah we stopped it and we closed

437
00:13:47,750 --> 00:13:46,079
up the airlock completely made sure that

438
00:13:49,189 --> 00:13:47,760

we can completely isolate it and then

439

00:13:51,110 --> 00:13:49,199

once we knew that we could close it out

440

00:13:52,629 --> 00:13:51,120

then we reopened it got the suits out

441

00:13:54,150 --> 00:13:52,639

and closed it back up tight okay you did

442

00:13:55,509 --> 00:13:54,160

this after the afternoon launched and

443

00:13:56,710 --> 00:13:55,519

you had him doing this stuff we had him

444

00:13:57,670 --> 00:13:56,720

doing all this

445

00:13:58,949 --> 00:13:57,680

post

446

00:14:00,870 --> 00:13:58,959

okay so that's what you had the crew

447

00:14:02,310 --> 00:14:00,880

doing after that so you had to leak all

448

00:14:03,910 --> 00:14:02,320

the way through the ascent well we

449

00:14:05,509 --> 00:14:03,920

picked it up about i think about five

450

00:14:07,189 --> 00:14:05,519

minutes into the first place but it was

451
00:14:08,790 --> 00:14:07,199
until the crew got out of their seats to

452
00:14:10,230 --> 00:14:08,800
close it yeah there's some valves on the

453
00:14:12,710 --> 00:14:10,240
airlock couches that they close and

454
00:14:14,550 --> 00:14:12,720
that'll stop it okay good all right so

455
00:14:16,230 --> 00:14:14,560
uh that was the first drone you said

456
00:14:17,910 --> 00:14:16,240
yeah what happened on the second the

457
00:14:20,069 --> 00:14:17,920
second practice the second run we didn't

458
00:14:21,509 --> 00:14:20,079
have too much it was an rtl's run and so

459
00:14:22,870 --> 00:14:21,519
for us it was just monitoring all the

460
00:14:24,949 --> 00:14:22,880
numbers

461
00:14:26,310 --> 00:14:24,959
to come back around yes okay so we're

462
00:14:27,670 --> 00:14:26,320
monitoring all the normal stuff we're

463
00:14:29,750 --> 00:14:27,680

going through all of our different

464

00:14:31,670 --> 00:14:29,760

cooling configurations that we use going

465

00:14:33,750 --> 00:14:31,680

uphill and then coming back down

466

00:14:35,350 --> 00:14:33,760

so we were on the fest going uphill

467

00:14:36,870 --> 00:14:35,360

which is the flash flash evaporator

468

00:14:39,030 --> 00:14:36,880

system

469

00:14:40,949 --> 00:14:39,040

for a while and then post miko post

470

00:14:42,470 --> 00:14:40,959

engine shutdown then we go to ammonia

471

00:14:44,470 --> 00:14:42,480

and we use it we have ammonia cooling to

472

00:14:46,389 --> 00:14:44,480

the ground on an rtls so just monitoring

473

00:14:47,670 --> 00:14:46,399

all that phenomenal stuff making sure

474

00:14:49,350 --> 00:14:47,680

everything goes okay now you talked

475

00:14:51,110 --> 00:14:49,360

about breathing air for the crew and

476

00:14:52,710 --> 00:14:51,120

temperature for the for the crew but

477

00:14:54,230 --> 00:14:52,720

it's well it's temperature for this

478

00:14:55,829 --> 00:14:54,240

equipment too right because that's

479

00:14:57,189 --> 00:14:55,839

really what's i mean that's generates a

480

00:14:58,790 --> 00:14:57,199

lot of heat right i mean we have a lot

481

00:15:00,550 --> 00:14:58,800

of hot air

482

00:15:02,230 --> 00:15:00,560

but uh but it's also the heat from the

483

00:15:03,910 --> 00:15:02,240

uh from the equipment from the vehicle

484

00:15:05,590 --> 00:15:03,920

yeah the first run actually we did have

485

00:15:07,670 --> 00:15:05,600

some problems with cooling the flash

486

00:15:09,350 --> 00:15:07,680

evaporator shut down so we had to go

487

00:15:10,949 --> 00:15:09,360

through and do some restarts on that and

488

00:15:12,150 --> 00:15:10,959

restore cooling

489

00:15:13,590 --> 00:15:12,160

because if you get cooling on the

490

00:15:15,030 --> 00:15:13,600

vehicle you have to come home that's so

491

00:15:16,389 --> 00:15:15,040

good you need any time of cooling it's

492

00:15:17,750 --> 00:15:16,399

very important right all right so you

493

00:15:19,750 --> 00:15:17,760

handle the coil it's not just keeping

494

00:15:21,990 --> 00:15:19,760

the crew comfy but keeping the space

495

00:15:24,069 --> 00:15:22,000

shuttle the entire vehicle

496

00:15:25,430 --> 00:15:24,079

comfy when you've got you we saw some

497

00:15:26,870 --> 00:15:25,440

folks in your back room that are feeding

498

00:15:28,310 --> 00:15:26,880

you information and you're working here

499

00:15:29,829 --> 00:15:28,320

with the flight director right i have

500

00:15:31,670 --> 00:15:29,839

two great back rooms i have a life

501
00:15:32,949 --> 00:15:31,680
support and a thermal all right and if

502
00:15:35,189 --> 00:15:32,959
you do information so you can help make

503
00:15:36,790 --> 00:15:35,199
decisions based on the data here exactly

504
00:15:38,470 --> 00:15:36,800
how do you like doing this stuff i like

505
00:15:39,910 --> 00:15:38,480
it a lot it is you like coming to work

506
00:15:40,949 --> 00:15:39,920
this morning it was like oh darn it i've

507
00:15:43,030 --> 00:15:40,959
got to see

508
00:15:44,710 --> 00:15:43,040
what was it this is an exciting thing to

509
00:15:45,829 --> 00:15:44,720
be able to come and do yeah come in here

510
00:15:47,269 --> 00:15:45,839
and do that yeah it's really great

511
00:15:48,470 --> 00:15:47,279
training how'd you get to do this stuff

512
00:15:50,550 --> 00:15:48,480
is it something you want to do since you

513
00:15:51,749 --> 00:15:50,560

were younger i did actually i wanted to

514

00:15:53,590 --> 00:15:51,759

do it probably since i was in junior

515

00:15:55,829 --> 00:15:53,600

high so did you or what since i was in

516

00:15:56,949 --> 00:15:55,839

junior high probably junior high yeah so

517

00:15:58,790 --> 00:15:56,959

it's been a while would you grow up

518

00:16:00,389 --> 00:15:58,800

around here i did i grew up in clear

519

00:16:02,150 --> 00:16:00,399

lake went to clay lake high school oh so

520

00:16:05,509 --> 00:16:02,160

my kid's going out oh really yeah so

521

00:16:07,990 --> 00:16:05,519

maybe it was this home maybe

522

00:16:10,389 --> 00:16:08,000

that's a nice school to go to i did yeah

523

00:16:11,670 --> 00:16:10,399

yeah it was great okay all right so

524

00:16:12,790 --> 00:16:11,680

thanks very much for visiting with us

525

00:16:14,310 --> 00:16:12,800

you got another one coming up here

526

00:16:15,910 --> 00:16:14,320

quickly yeah a couple more i think we

527

00:16:18,150 --> 00:16:15,920

might have a break though first

528

00:16:19,829 --> 00:16:18,160

here okay what's going on for me with

529

00:16:21,189 --> 00:16:19,839

the crew right now yeah all right do you

530

00:16:22,310 --> 00:16:21,199

need to pay attention to what's going on

531

00:16:23,749 --> 00:16:22,320

i didn't have any failures so i'm

532

00:16:25,590 --> 00:16:23,759

probably okay

533

00:16:27,590 --> 00:16:25,600

thanks sarah

534

00:16:29,749 --> 00:16:27,600

you're the booster guy correct so we're

535

00:16:32,389 --> 00:16:29,759

looking at the three engines we're

536

00:16:34,790 --> 00:16:32,399

looking at data for the external tank

537

00:16:36,310 --> 00:16:34,800

data for the solid rocket boosters and

538

00:16:38,790 --> 00:16:36,320

data for some of the valves within the

539

00:16:40,310 --> 00:16:38,800

orbiter okay and some of our data was

540

00:16:42,230 --> 00:16:40,320

telling us that the center engine might

541

00:16:43,670 --> 00:16:42,240

have failed might have failed might have

542

00:16:44,949 --> 00:16:43,680

failed we couldn't confirm that it was

543

00:16:46,949 --> 00:16:44,959

out okay

544

00:16:48,949 --> 00:16:46,959

and so a lot of the discussion just just

545

00:16:50,550 --> 00:16:48,959

went on about how we could confirm that

546

00:16:53,189 --> 00:16:50,560

it was out if we didn't have some some

547

00:16:55,350 --> 00:16:53,199

backup cues all right and uh

548

00:16:57,990 --> 00:16:55,360

we ended up going on an rtls or return

549

00:16:59,350 --> 00:16:58,000

to launch site trajectory okay

550

00:17:00,710 --> 00:16:59,360

and you should but that was not the

551

00:17:02,389 --> 00:17:00,720

right thing maybe to do no it was the

552

00:17:04,710 --> 00:17:02,399

right thing to do the engine had failed

553

00:17:06,710 --> 00:17:04,720

it did yeah it took us about a minute to

554

00:17:09,110 --> 00:17:06,720

figure out that yes it was out

555

00:17:12,230 --> 00:17:09,120

and uh so we had the crew perform the

556

00:17:14,150 --> 00:17:12,240

rtls support okay so it'll work out okay

557

00:17:16,230 --> 00:17:14,160

it did all right what was it like for

558

00:17:17,909 --> 00:17:16,240

you was it pretty hairy it was hairy for

559

00:17:19,510 --> 00:17:17,919

the first couple minutes because you

560

00:17:21,029 --> 00:17:19,520

couldn't tell if that engine was running

561

00:17:23,029 --> 00:17:21,039

and the flight director is looking for

562

00:17:24,630 --> 00:17:23,039

you to to tell them yes or no and they

563

00:17:26,470 --> 00:17:24,640

just don't have any data telling you i'm

564

00:17:28,630 --> 00:17:26,480

telling you either way so what made you

565

00:17:29,990 --> 00:17:28,640

decide that it actually was out

566

00:17:32,549 --> 00:17:30,000

when we got to

567

00:17:35,590 --> 00:17:32,559

near we got near srv separation

568

00:17:37,270 --> 00:17:35,600

the acceleration was about

569

00:17:38,789 --> 00:17:37,280

0.6 g's

570

00:17:40,950 --> 00:17:38,799

and when the solid rockets were going to

571

00:17:42,549 --> 00:17:40,960

leave exactly right normally it's about

572

00:17:43,510 --> 00:17:42,559

0.9 g's

573

00:17:45,350 --> 00:17:43,520

so

574

00:17:47,909 --> 00:17:45,360

our inclination was that yeah it had

575

00:17:50,070 --> 00:17:47,919

failed and we told the crew to to get

576

00:17:51,909 --> 00:17:50,080

ready for the our tls aboard okay so

577

00:17:53,909 --> 00:17:51,919

that's what that's what it was all right

578

00:17:55,510 --> 00:17:53,919

cool so so how do you like doing this

579

00:17:58,549 --> 00:17:55,520

was it fun for you or was it oh it's a

580

00:18:01,029 --> 00:17:58,559

blast yeah it's stressful literally yeah

581

00:18:02,390 --> 00:18:01,039

yeah it's stressful but it's fun exactly

582

00:18:03,750 --> 00:18:02,400

yeah all right

583

00:18:05,270 --> 00:18:03,760

they have to make it stressful on us

584

00:18:07,510 --> 00:18:05,280

here in the simulations and give us a

585

00:18:09,750 --> 00:18:07,520

lot of crazy failures because you know

586

00:18:12,870 --> 00:18:09,760

when that one thing if one thing does

587

00:18:15,110 --> 00:18:12,880

fail on uh actual launch day it can be

588

00:18:17,909 --> 00:18:15,120

very stressful right and how long you've

589

00:18:19,669 --> 00:18:17,919

been doing this rick for just over four

590

00:18:22,230 --> 00:18:19,679

years four years and this

591

00:18:24,310 --> 00:18:22,240

this flight sts-133 will be my first

592

00:18:25,750 --> 00:18:24,320

flight as booster in the in the front

593

00:18:28,070 --> 00:18:25,760

room in the front room so you're pretty

594

00:18:29,909 --> 00:18:28,080

excited oh yeah yeah it'll be it'll be a