Orbital D-1 Rendezvous Profile

250 METERS TO CAPTURE

CAPTURE POINT = 10M — GO/NOGO

Hold Point - 30M — GO/NOGO

RANGE = 55M — DEMO 10

RANGE = 200M — DEMO 8, 9

Hold Point - 250M — APPROACH BURN 5 GO/NOGO

● Demo Objectives ▲ Go / No-Go Polls ◆ Approach Burns

1
00:00:05,349 --> 00:00:03,270
wyatt smith he's the chief training

2
00:00:06,470 --> 00:00:05,359
officer not only for our personnel down

3
00:00:09,990 --> 00:00:06,480
here on the ground but also our

4
00:00:13,910 --> 00:00:12,470
now why we just heard from ray

5
00:00:15,509 --> 00:00:13,920
members of this team you guys have been

6
00:00:16,710 --> 00:00:15,519
training for this first orbital flight

7
00:00:19,109 --> 00:00:16,720
for years

8
00:00:20,390 --> 00:00:19,119
so first off you know what what are just

9
00:00:22,150 --> 00:00:20,400
some of the things that you've been in

10
00:00:25,189 --> 00:00:22,160
charge of trying to get the ground team

11
00:00:26,150 --> 00:00:25,199
ready for this very historic flight

12
00:00:27,750 --> 00:00:26,160
um

13
00:00:31,429 --> 00:00:27,760

we've been working

14
00:00:33,750 --> 00:00:31,439
for about five years on development of

15
00:00:35,990 --> 00:00:33,760
all the training products and simulators

16
00:00:38,470 --> 00:00:36,000
that have gone into the training

17
00:00:40,709 --> 00:00:38,480
so there's been a lot of effort by

18
00:00:42,709 --> 00:00:40,719
the simulator development team

19
00:00:45,750 --> 00:00:42,719
and obviously the instructors to develop

20
00:00:47,750 --> 00:00:45,760
all the products the classroom lessons

21
00:00:50,790 --> 00:00:47,760
uh to get ready for this

22
00:00:53,350 --> 00:00:50,800
and so this is this is a first so i'm

23
00:00:55,750 --> 00:00:53,360
assuming anytime it's a first a lot of

24
00:00:57,189 --> 00:00:55,760
extra effort has to go in to preparing

25
00:00:58,709 --> 00:00:57,199
the team for something

26
00:01:01,029 --> 00:00:58,719
yeah there was a lot of effort that went

27
00:01:02,470 --> 00:01:01,039
into the development of all the the

28
00:01:04,070 --> 00:01:02,480
products

29
00:01:06,390 --> 00:01:04,080
i was involved very heavily in the

30
00:01:08,230 --> 00:01:06,400
development of the simulator

31
00:01:10,789 --> 00:01:08,240
interface that was used the actual

32
00:01:13,910 --> 00:01:10,799
simulator is located in dulles

33
00:01:15,030 --> 00:01:13,920
virginia at the orbital facility and we

34
00:01:16,870 --> 00:01:15,040
use our

35
00:01:19,190 --> 00:01:16,880
iss simulation

36
00:01:21,190 --> 00:01:19,200
here and interface the two together and

37
00:01:22,390 --> 00:01:21,200
that was a very lengthy effort that went

38
00:01:23,990 --> 00:01:22,400

into doing that

39
00:01:25,830 --> 00:01:24,000
but we were on a pretty short time frame

40
00:01:27,749 --> 00:01:25,840
so we had to do a lot of extra effort to

41
00:01:28,950 --> 00:01:27,759
get that working correctly there was

42
00:01:30,390 --> 00:01:28,960
also other simulators that were

43
00:01:31,670 --> 00:01:30,400
developed that the

44
00:01:33,749 --> 00:01:31,680
more small

45
00:01:36,390 --> 00:01:33,759
simulators that the crew would use and

46
00:01:38,710 --> 00:01:36,400
those were also developed in parallel

47
00:01:41,270 --> 00:01:38,720
so a lot of simulator development effort

48
00:01:43,429 --> 00:01:41,280
and obviously all the products that were

49
00:01:45,429 --> 00:01:43,439
used to train the crew and the ground

50
00:01:46,469 --> 00:01:45,439
personnel had to be you know built from

51
00:01:49,030 --> 00:01:46,479
scratch

52
00:01:52,149 --> 00:01:49,040
we had a few things to use as

53
00:01:54,149 --> 00:01:52,159
sort of models from like htv or other

54
00:01:55,590 --> 00:01:54,159
vehicles cargo crash wasn't the first

55
00:01:58,469 --> 00:01:55,600
time that we've done things like this

56
00:02:00,550 --> 00:01:58,479
but uh the vehicle is unique uh in its

57
00:02:01,830 --> 00:02:00,560
own way and so we had to

58
00:02:03,109 --> 00:02:01,840
uh

59
00:02:04,389 --> 00:02:03,119
work pretty hard to get all that stuff

60
00:02:06,149 --> 00:02:04,399
complete

61
00:02:09,190 --> 00:02:06,159
okay and you talk you talk a lot about

62
00:02:11,029 --> 00:02:09,200
simulators now the entire team is just

63
00:02:12,710 --> 00:02:11,039

going through you know simulation after

64
00:02:13,990 --> 00:02:12,720
simulation of just

65
00:02:15,750 --> 00:02:14,000
everything that could possibly happen

66
00:02:17,350 --> 00:02:15,760
with this vehicle is that what's is that

67
00:02:18,309 --> 00:02:17,360
what's going on

68
00:02:20,229 --> 00:02:18,319
um

69
00:02:20,949 --> 00:02:20,239
well there's a couple different aspects

70
00:02:29,110 --> 00:02:20,959
the

71
00:02:31,509 --> 00:02:29,120
um

72
00:02:34,790 --> 00:02:31,519
maybe the last couple hours or maybe

73
00:02:37,030 --> 00:02:34,800
even the last hour of the of the event

74
00:02:38,869 --> 00:02:37,040
and it's really on that focus is really

75
00:02:41,030 --> 00:02:38,879
on their their tasks that they have to

76
00:02:42,790 --> 00:02:41,040
perform at that time what is what is

77
00:02:44,630 --> 00:02:42,800
what would the crew's task be in that

78
00:02:46,630 --> 00:02:44,640
final those final moments um the crew is

79
00:02:49,350 --> 00:02:46,640
responsible since this is a demo mission

80
00:02:51,110 --> 00:02:49,360
the crew is responsible for um watching

81
00:02:53,509 --> 00:02:51,120
the vehicle come up what's called the r

82
00:02:54,949 --> 00:02:53,519
bar so from underneath iss

83
00:02:56,790 --> 00:02:54,959
they'll be monitoring the vehicle make

84
00:02:57,830 --> 00:02:56,800
sure that it's on its correct trajectory

85
00:03:00,790 --> 00:02:57,840
toward

86
00:03:02,869 --> 00:03:00,800
the grapple point and also they perform

87
00:03:04,790 --> 00:03:02,879
some demonstrated

88
00:03:06,470 --> 00:03:04,800

demo objectives that are

89
00:03:08,630 --> 00:03:06,480
where they they pause the vehicle and

90
00:03:10,149 --> 00:03:08,640
make it go away using a command panel

91
00:03:11,750 --> 00:03:10,159
that they have

92
00:03:14,710 --> 00:03:11,760
so they have to report to the ground how

93
00:03:16,790 --> 00:03:14,720
the vehicle is performing with a lot of

94
00:03:18,149 --> 00:03:16,800
visual aids that they have

95
00:03:19,430 --> 00:03:18,159
and then they actually do the grapple

96
00:03:21,509 --> 00:03:19,440
with the arm

97
00:03:23,670 --> 00:03:21,519
the ground personnel are watching from

98
00:03:24,949 --> 00:03:23,680
much further out on the orbital team you

99
00:03:28,149 --> 00:03:24,959
know they obviously watch the whole

100
00:03:30,630 --> 00:03:28,159
entire uh rendezvous and then there's a

101
00:03:33,750 --> 00:03:30,640
joint operations phase that occurs

102
00:03:36,149 --> 00:03:33,760
uh maybe for the last four hours of the

103
00:03:37,589 --> 00:03:36,159
the flight in which the team here is

104
00:03:38,550 --> 00:03:37,599
heavily involved in monitoring the

105
00:03:41,350 --> 00:03:38,560
vehicle

106
00:03:43,910 --> 00:03:41,360
and some demo things that happen

107
00:03:45,670 --> 00:03:43,920
but during the simulations uh we we do

108
00:03:47,350 --> 00:03:45,680
all the nominal operations we verify all

109
00:03:49,350 --> 00:03:47,360
the procedures are correct

110
00:03:50,789 --> 00:03:49,360
and we also put in

111
00:03:53,670 --> 00:03:50,799
i'm the evil guy

112
00:03:55,509 --> 00:03:53,680
so our team gets to put in a lot of

113
00:03:57,350 --> 00:03:55,519

malfunctions and make sure that the

114
00:03:59,190 --> 00:03:57,360
ground team and the crew respond

115
00:04:00,550 --> 00:03:59,200
correctly to what the malfunctions are

116
00:04:02,309 --> 00:04:00,560
you get to try and trip them up have a

117
00:04:03,190 --> 00:04:02,319
little we try our hardest to trip them

118
00:04:04,390 --> 00:04:03,200
up

119
00:04:06,710 --> 00:04:04,400
you know we have to make sure they can

120
00:04:09,190 --> 00:04:06,720
do all the nominal procedures correctly

121
00:04:10,949 --> 00:04:09,200
but we do

122
00:04:12,630 --> 00:04:10,959
try to put some things in there that are

123
00:04:15,589 --> 00:04:12,640
that are helping them learn and

124
00:04:16,990 --> 00:04:15,599
exercising flight rules that we have

125
00:04:19,270 --> 00:04:17,000
so it's

126
00:04:20,870 --> 00:04:19,280
it's good to see the you know the teams

127
00:04:22,550 --> 00:04:20,880
come together

128
00:04:24,629 --> 00:04:22,560
and perform well

129
00:04:26,469 --> 00:04:24,639
and you said with the last in the last

130
00:04:29,110 --> 00:04:26,479
few hours is really joint operation

131
00:04:30,950 --> 00:04:29,120
between nasa and orbital it's not just

132
00:04:32,629 --> 00:04:30,960
you know one or the other

133
00:04:35,350 --> 00:04:32,639
um what are what are some of the things

134
00:04:37,189 --> 00:04:35,360
you've learned or experienced uh in

135
00:04:39,350 --> 00:04:37,199
joint training with orbital i mean has

136
00:04:42,230 --> 00:04:39,360
it been vastly different

137
00:04:44,390 --> 00:04:42,240
say from training for an atv or an htv

138
00:04:46,550 --> 00:04:44,400

international partner vastly different

139
00:04:47,749 --> 00:04:46,560
from training for spacex

140
00:04:51,670 --> 00:04:47,759
similar

141
00:04:53,590 --> 00:04:51,680
that i saw was that you know orbital had

142
00:04:55,350 --> 00:04:53,600
a certain way of operating

143
00:04:56,870 --> 00:04:55,360
they've operated satellites for years

144
00:04:58,469 --> 00:04:56,880
you know in-house

145
00:05:01,110 --> 00:04:58,479
but then you bring the nasa team in and

146
00:05:03,590 --> 00:05:01,120
so there's a different element of of

147
00:05:05,110 --> 00:05:03,600
information exchange that occurs in the

148
00:05:06,310 --> 00:05:05,120
nominal procedures

149
00:05:07,990 --> 00:05:06,320
and

150
00:05:09,510 --> 00:05:08,000
i think that you know the first few

151
00:05:11,029 --> 00:05:09,520
simulations we did really brought out

152
00:05:12,710 --> 00:05:11,039
that that's going to be a little bit of

153
00:05:14,950 --> 00:05:12,720
a difficult choreography to pull all

154
00:05:17,110 --> 00:05:14,960
that together so they they worked real

155
00:05:18,710 --> 00:05:17,120
hard and i think you know in the last

156
00:05:20,629 --> 00:05:18,720
few simulations we really saw it being

157
00:05:22,550 --> 00:05:20,639
very crisp and clean

158
00:05:24,150 --> 00:05:22,560
so they you know they kind of started

159
00:05:26,469 --> 00:05:24,160
off with you know what do we say and how

160
00:05:27,749 --> 00:05:26,479
do we do this and it has evolved

161
00:05:29,189 --> 00:05:27,759
there's also

162
00:05:30,950 --> 00:05:29,199
jax's involved

163
00:05:33,990 --> 00:05:30,960

so we had those those guys in

164
00:05:36,390 --> 00:05:34,000
simulations because orbital uses the the

165
00:05:38,230 --> 00:05:36,400
proc system in the gym to get radio

166
00:05:40,790 --> 00:05:38,240
communication with their vehicle when

167
00:05:43,110 --> 00:05:40,800
it's within range so we had

168
00:05:45,990 --> 00:05:43,120
trilateral simulation simulations with

169
00:05:48,310 --> 00:05:46,000
um with the jaxa guys and uh that just

170
00:05:50,790 --> 00:05:48,320
you know added a third element of of

171
00:05:51,590 --> 00:05:50,800
complexity to it but can't make things

172
00:05:53,670 --> 00:05:51,600
easy

173
00:05:55,189 --> 00:05:53,680
well it all worked out and i think that

174
00:05:57,430 --> 00:05:55,199
everybody's prepared

175
00:05:59,029 --> 00:05:57,440
okay is now in the in the training flow

176
00:06:00,950 --> 00:05:59,039
for everything is there any uh

177
00:06:02,950 --> 00:06:00,960
particular moment in this demo mission

178
00:06:05,510 --> 00:06:02,960
that has received you know special focus

179
00:06:07,270 --> 00:06:05,520
required a lot of training something

180
00:06:09,270 --> 00:06:07,280
maybe that hasn't been done yet or

181
00:06:10,950 --> 00:06:09,280
because it is obviously a lot of it's

182
00:06:12,230 --> 00:06:10,960
all new because it's a new vehicle but

183
00:06:15,189 --> 00:06:12,240
is there any part of the training flow

184
00:06:17,430 --> 00:06:15,199
that really you guys had to hone in on

185
00:06:19,670 --> 00:06:17,440
um i think the last two hours of the the

186
00:06:22,870 --> 00:06:19,680
rendezvous are are probably what got the

187
00:06:26,070 --> 00:06:24,150
you know that's when you know the

188
00:06:27,909 --> 00:06:26,080

vehicle is getting closer and things are

189
00:06:29,990 --> 00:06:27,919
getting a little bit more

190
00:06:31,510 --> 00:06:30,000
uh fast-paced

191
00:06:33,029 --> 00:06:31,520
and uh

192
00:06:34,469 --> 00:06:33,039
so

193
00:06:35,909 --> 00:06:34,479
i think that's you know where the crew

194
00:06:37,110 --> 00:06:35,919
gets really involved and there's a lot

195
00:06:38,390 --> 00:06:37,120
of you know

196
00:06:40,150 --> 00:06:38,400
once the vehicles

197
00:06:41,430 --> 00:06:40,160
you know within a a couple hundred

198
00:06:42,870 --> 00:06:41,440
meters of station you know you want to

199
00:06:44,790 --> 00:06:42,880
make sure that everything goes good so

200
00:06:46,469 --> 00:06:44,800
we we certainly did that on most of the

201
00:06:47,990 --> 00:06:46,479
simulations we also did some departure

202
00:06:50,629 --> 00:06:48,000
simulations but those are a little

203
00:06:52,629 --> 00:06:50,639
little more easy to do than the

204
00:06:53,270 --> 00:06:52,639
really close end stuff

205
00:06:54,870 --> 00:06:53,280
and

206
00:06:56,790 --> 00:06:54,880
right right before this you told me you

207
00:06:58,309 --> 00:06:56,800
guys have been preparing for this you

208
00:07:00,710 --> 00:06:58,319
know for years

209
00:07:02,790 --> 00:07:00,720
you and the team i've done a lot of hard

210
00:07:04,870 --> 00:07:02,800
work you guys kind of excited to finally

211
00:07:06,150 --> 00:07:04,880
see it all come to fruition yeah we're

212
00:07:08,070 --> 00:07:06,160
very excited there's been a lot of

213
00:07:09,830 --> 00:07:08,080

delays that have happened over the past

214
00:07:11,350 --> 00:07:09,840
couple years because of various

215
00:07:13,350 --> 00:07:11,360
different things that have happened in

216
00:07:14,390 --> 00:07:13,360
the vehicle development

217
00:07:15,670 --> 00:07:14,400
and uh

218
00:07:18,390 --> 00:07:15,680
it's hard to believe that it's finally

219
00:07:20,870 --> 00:07:18,400
here and uh we're certainly very excited

220
00:07:23,589 --> 00:07:20,880
about it um this this week i think one

221
00:07:25,350 --> 00:07:23,599
thing that comes to mind is that we do

222
00:07:27,350 --> 00:07:25,360
we also do onboard training for the crew

223
00:07:29,110 --> 00:07:27,360
so the crew has a small simulator on

224
00:07:30,710 --> 00:07:29,120
board and we do various different

225
00:07:32,390 --> 00:07:30,720
briefings with the crew

226
00:07:34,710 --> 00:07:32,400
and and this started this past monday

227
00:07:37,510 --> 00:07:34,720
and it goes to um

228
00:07:38,950 --> 00:07:37,520
the arrival date in a couple weeks and

229
00:07:40,230 --> 00:07:38,960
it's real exciting to see that happen

230
00:07:42,150 --> 00:07:40,240
because that kind of shows you that it's

231
00:07:43,749 --> 00:07:42,160
real and it's actually going to happen

232
00:07:46,790 --> 00:07:43,759
so we're we're excited to finally

233
00:07:48,070 --> 00:07:46,800
finally get that part of it going and

234
00:07:50,230 --> 00:07:48,080
have a success

235
00:07:51,990 --> 00:07:50,240
all right and it is a very exciting time

236
00:07:54,309 --> 00:07:52,000
again wyatt smith he's our chief

237
00:07:56,070 --> 00:07:54,319
training officer for our teams down here

238
00:07:57,990 --> 00:07:56,080

and for our astronauts getting ready for

239
00:07:59,830 --> 00:07:58,000
that first orbital demonstration mission

240
00:08:01,990 --> 00:07:59,840
to the international space station

241
00:08:05,029 --> 00:08:02,000
launching on september 17th grapple and

242
00:08:07,350 --> 00:08:05,039
docking on september 22nd so why thanks

243
00:08:09,350 --> 00:08:07,360
so much uh great job to you and the team

244
00:08:11,350 --> 00:08:09,360
really looking forward to watching a

245
00:08:13,990 --> 00:08:11,360
successful operation know you it's in