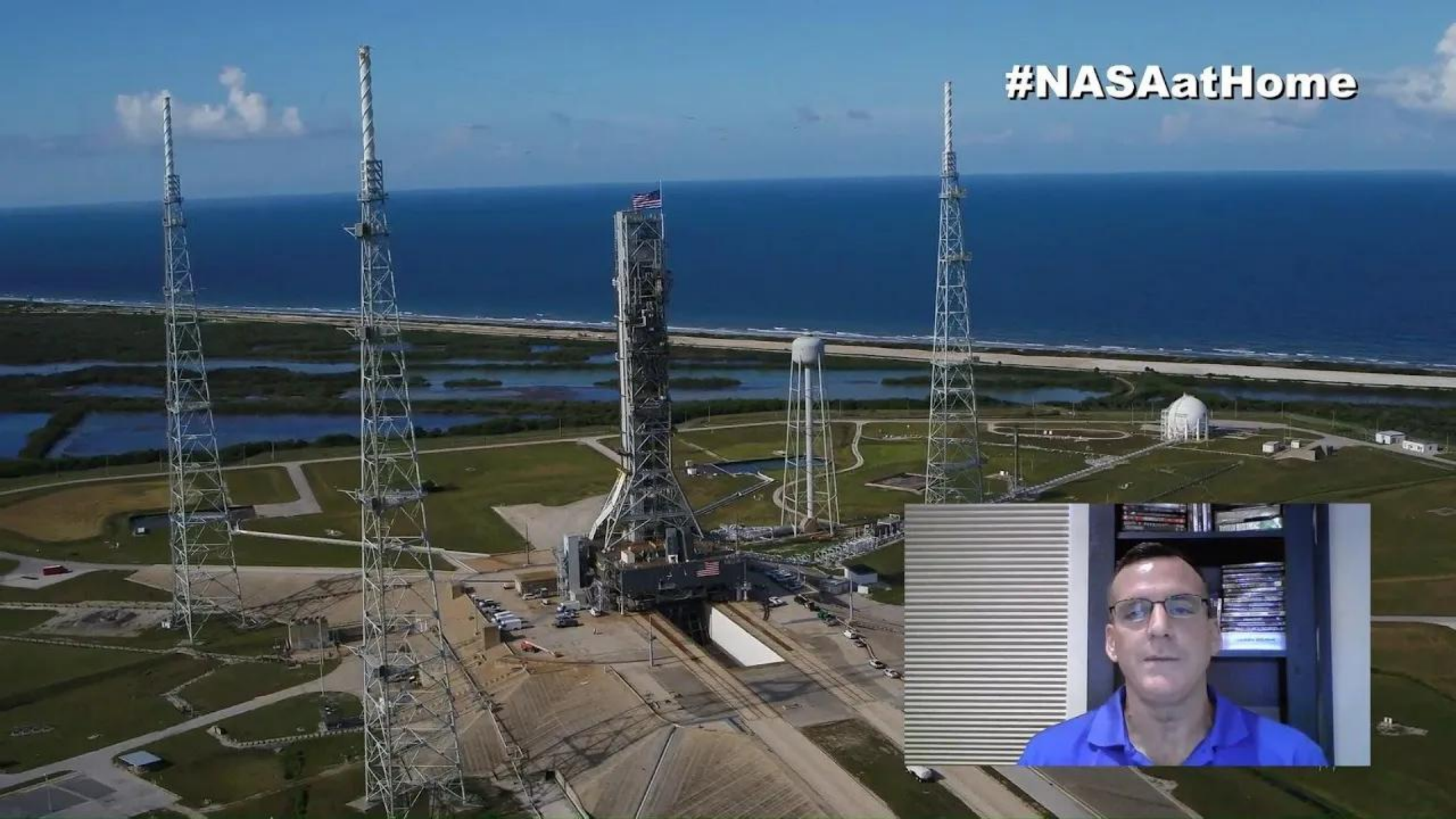
#NASAatHome

1
00:01:19,910 --> 00:00:55,810
[Music]

2
00:01:24,900 --> 00:01:22,859
hey what's going on welcome I am Joshua

3
00:01:26,040 --> 00:01:24,910
Santora and I'm coming to you live from

4
00:01:27,990 --> 00:01:26,050
the Kennedy Space Center

5
00:01:29,940 --> 00:01:28,000
sort of that's my traditional work

6
00:01:31,859 --> 00:01:29,950
environment but obviously with the state

7
00:01:33,060 --> 00:01:31,869
of things I'm at home working like most

8
00:01:35,730 --> 00:01:33,070
of America working like most of the

9
00:01:38,219 --> 00:01:35,740
agency trying to stay busy certainly

10
00:01:40,350 --> 00:01:38,229
busy putting on things like this glad

11
00:01:42,780 --> 00:01:40,360
you could join us today we have a very

12
00:01:46,710 --> 00:01:42,790
special treat we're gonna be talking

13
00:01:49,080 --> 00:01:46,720

about one of NASA's treasures this is

14
00:01:51,150 --> 00:01:49,090
the mobile launcher NASA's mobile

15
00:01:53,490 --> 00:01:51,160
launcher there on the top left you can

16
00:01:55,350 --> 00:01:53,500
see in the distance launch complex 39b

17
00:01:56,490 --> 00:01:55,360
we'll talk more about that today and

18
00:01:59,370 --> 00:01:56,500
then the mobile launcher on the

19
00:02:01,800 --> 00:01:59,380
right-hand side a massive literally

20
00:02:04,770 --> 00:02:01,810
massive massive structure that we are

21
00:02:08,699 --> 00:02:04,780
gonna be launching the next NASA's next

22
00:02:10,530 --> 00:02:08,709
deep deep space rocket into orbit and to

23
00:02:12,810 --> 00:02:10,540
do that we have an expert here joining

24
00:02:15,090 --> 00:02:12,820
us in just a few minutes but wanted to

25
00:02:17,220 --> 00:02:15,100
call attention to the fact that as we

26
00:02:18,780 --> 00:02:17,230
talk about this spaceport series we're

27
00:02:20,699 --> 00:02:18,790
looking at the Kennedy Space Center and

28
00:02:22,979 --> 00:02:20,709
the Kennedy's spaceport as I love to

29
00:02:26,130 --> 00:02:22,989
affectionately call it and specifically

30
00:02:29,039 --> 00:02:26,140
we're looking at exploration ground

31
00:02:31,199 --> 00:02:29,049
systems today so we're talking about EGS

32
00:02:33,569 --> 00:02:31,209
as we love to call it they're working on

33
00:02:36,449 --> 00:02:33,579
developing the infrastructure to launch

34
00:02:38,280 --> 00:02:36,459
the world's most powerful rocket so we

35
00:02:41,310 --> 00:02:38,290
are super excited for that and let me go

36
00:02:46,170 --> 00:02:41,320
ahead and welcome in now my very special

37
00:02:48,000 --> 00:02:46,180
guest this is cliff let me make sure get

38
00:02:52,080 --> 00:02:48,010

this right lanham cliff how are you

39
00:02:54,720 --> 00:02:52,090
today doing well Josh thanks hey thanks

40
00:02:56,520 --> 00:02:54,730
for joining us obviously you two are not

41
00:02:58,830 --> 00:02:56,530
at the Space Center you are at home

42
00:03:01,860 --> 00:02:58,840
working so appreciate you joining us I'm

43
00:03:04,470 --> 00:03:01,870
glad to have you on board thanks Josh

44
00:03:05,789 --> 00:03:04,480
good to be here and hopefully give some

45
00:03:07,940 --> 00:03:05,799
people some insight on the mobile

46
00:03:10,050 --> 00:03:07,950
launcher yeah and as we talk today

47
00:03:12,479 --> 00:03:10,060
obviously your title there at senior

48
00:03:15,210 --> 00:03:12,489
senior project manager I'm so a very big

49
00:03:16,650 --> 00:03:15,220
deal I want to also call out hey feel

50
00:03:18,480 --> 00:03:16,660
free to shoot us questions

51
00:03:20,130 --> 00:03:18,490
in the chat window feel free to shoot us

52
00:03:23,070 --> 00:03:20,140
questions using the hashtag and not

53
00:03:24,660 --> 00:03:23,080
excuse me hashtag Nessa at home and so

54
00:03:26,970 --> 00:03:24,670
lots of opportunity there to engage with

55
00:03:28,710 --> 00:03:26,980
us please continue to do that over not

56
00:03:29,520 --> 00:03:28,720
only this time but also more let's jump

57
00:03:32,040 --> 00:03:29,530
right in

58
00:03:33,870 --> 00:03:32,050
cliff so as part of NASA's Artemis

59
00:03:35,730 --> 00:03:33,880
program hopefully everyone's heard of

60
00:03:37,350 --> 00:03:35,740
the Artemis program it's how we're

61
00:03:40,500 --> 00:03:37,360
sending the next or excuse me the first

62
00:03:42,660 --> 00:03:40,510
woman and next man to the moon and that

63
00:03:45,660 --> 00:03:42,670

launch complex 39b and mobile launcher

64
00:03:48,740 --> 00:03:45,670
are critical to that so can you tell me

65
00:03:53,280 --> 00:03:48,750
more about what is this huge undertaking

66
00:03:57,090 --> 00:03:53,290
sure Josh so the mobile launcher is the

67
00:03:59,750 --> 00:03:57,100
primary structural element that'll the

68
00:04:01,830 --> 00:03:59,760
rocket is actually assembled on so

69
00:04:03,980 --> 00:04:01,840
essentially the mobile launcher will be

70
00:04:06,950 --> 00:04:03,990
in the Vehicle Assembly Building and

71
00:04:09,690 --> 00:04:06,960
high-bay three of that building and then

72
00:04:11,820 --> 00:04:09,700
essentially gets connected up to the

73
00:04:13,830 --> 00:04:11,830
Vehicle Assembly Building and then we

74
00:04:16,470 --> 00:04:13,840
start stacking the rocket on the mobile

75
00:04:18,510 --> 00:04:16,480
launcher or on base essentially the

76
00:04:22,020 --> 00:04:18,520
boosters get stacked followed by the

77
00:04:24,810 --> 00:04:22,030
core stage the upper stage and then the

78
00:04:29,070 --> 00:04:24,820
Orion service module will get stacked as

79
00:04:30,630 --> 00:04:29,080
well the mobile launcher so from as far

80
00:04:33,180 --> 00:04:30,640
as the mobile launcher in building it

81
00:04:36,540 --> 00:04:33,190
just to kind of give people a feel for

82
00:04:38,450 --> 00:04:36,550
how big it is basically it's almost four

83
00:04:43,860 --> 00:04:38,460
hundred feet from the ground to the top

84
00:04:46,410 --> 00:04:43,870
the base itself is two levels deep it's

85
00:04:48,480 --> 00:04:46,420
roughly the size surface area of which a

86
00:04:49,980 --> 00:04:48,490
baseball infield a major league baseball

87
00:04:55,370 --> 00:04:49,990
infield kind of give you some

88
00:04:58,380 --> 00:04:55,380

perspective there 153 feet by 133 feet

89
00:05:06,540 --> 00:04:58,390
basically it weighs and 1/2 million

90
00:05:08,250 --> 00:05:06,550
pounds I think you just I think you just

91
00:05:10,350 --> 00:05:08,260
said what I heard you say was ten and a

92
00:05:13,230 --> 00:05:10,360
half million pounds is that is that a

93
00:05:15,690 --> 00:05:13,240
correct number that is a correct number

94
00:05:18,600 --> 00:05:15,700
and it's a lot of Steel making up the

95
00:05:20,370 --> 00:05:18,610
mobile launcher short that's incredible

96
00:05:21,600 --> 00:05:20,380
so ultimately we say it's a mobile

97
00:05:23,700 --> 00:05:21,610
launcher and I want people to appreciate

98
00:05:24,930 --> 00:05:23,710
that that it's not something that you

99
00:05:26,880 --> 00:05:24,940
build in place it's one thing to build

100
00:05:28,469 --> 00:05:26,890
something in place that's 10 million

101
00:05:29,730 --> 00:05:28,479
pounds it's a whole different game to

102
00:05:32,279 --> 00:05:29,740
build something

103
00:05:32,999 --> 00:05:32,289
million pounds that you move that's

104
00:05:35,490 --> 00:05:33,009
correct

105
00:05:37,830 --> 00:05:35,500
we're like the kind of analogy of it we

106
00:05:40,909 --> 00:05:37,840
built a skyscraper that we removed

107
00:05:43,469 --> 00:05:40,919
around and launched a rocket from so

108
00:05:46,650 --> 00:05:43,479
it's it's a it's a massive structure

109
00:05:47,779 --> 00:05:46,660
it's taken a while to get it built it's

110
00:05:49,890 --> 00:05:47,789
very complex

111
00:05:54,540 --> 00:05:49,900
that's what I always like to tell people

112
00:05:56,219 --> 00:05:54,550
is the technology is not off the charts

113
00:05:57,900 --> 00:05:56,229

you know mind-bending like maybe some of

114
00:06:00,210 --> 00:05:57,910
the spacecraft going out the bars and

115
00:06:01,559 --> 00:06:00,220
all sure the complexity of the systems

116
00:06:04,350 --> 00:06:01,569
and trying to make them all work

117
00:06:06,600 --> 00:06:04,360
together is off the chart yes so

118
00:06:09,330 --> 00:06:06,610
currently I know we're targeting a 2021

119
00:06:11,040 --> 00:06:09,340
time for our first launch of the Artemis

120
00:06:12,839 --> 00:06:11,050
program which will use that mobile

121
00:06:14,820 --> 00:06:12,849
launcher so thinking about that

122
00:06:17,040 --> 00:06:14,830
obviously we're looking at about a year

123
00:06:18,510 --> 00:06:17,050
out so where are we in the process we've

124
00:06:20,760 --> 00:06:18,520
been here four years kind of developing

125
00:06:24,420 --> 00:06:20,770
and getting ready so so what's the big

126
00:06:26,249 --> 00:06:24,430
picture timeline wise so let me go back

127
00:06:28,170 --> 00:06:26,259
just for a second I'll go back in time a

128
00:06:29,430 --> 00:06:28,180
little bit so the original mobile one

129
00:06:30,600 --> 00:06:29,440
this mobile launcher was originally

130
00:06:32,909 --> 00:06:30,610
built for the constellation program

131
00:06:34,879 --> 00:06:32,919
which is going to take astronauts into

132
00:06:37,620 --> 00:06:34,889
low-earth orbit ultimately to the moon

133
00:06:41,700 --> 00:06:37,630
so it was a much smaller rocket than the

134
00:06:43,499 --> 00:06:41,710
SLS Orion will be so what we did was we

135
00:06:45,510 --> 00:06:43,509
had to go and modify the mobile launcher

136
00:06:47,790 --> 00:06:45,520
and what we did we tripled the size of

137
00:06:50,219 --> 00:06:47,800
the flame hole because now we have two

138
00:06:52,920 --> 00:06:50,229

boosters and a core stage with four

139
00:06:54,839 --> 00:06:52,930
engines on it within that you know area

140
00:06:57,779 --> 00:06:54,849
of the flame hole so we had to do that

141
00:06:59,490 --> 00:06:57,789
that was a single contract and then we

142
00:07:02,279 --> 00:06:59,500
just now the contract we're currently

143
00:07:04,649 --> 00:07:02,289
wrapping up at this time is the ground

144
00:07:06,749 --> 00:07:04,659
support equipment contract all the

145
00:07:09,149 --> 00:07:06,759
ground support equipment is what's there

146
00:07:12,089 --> 00:07:09,159
to support and provide your commodities

147
00:07:14,700 --> 00:07:12,099
their services your power your fuels for

148
00:07:17,670 --> 00:07:14,710
the rocket there's mechanical systems

149
00:07:21,570 --> 00:07:17,680
that would be you know on there they

150
00:07:23,370 --> 00:07:21,580
would include the umbilicals that type

151
00:07:24,890 --> 00:07:23,380
of stuff then you got the electrical

152
00:07:27,689 --> 00:07:24,900
systems which would have power

153
00:07:30,809 --> 00:07:27,699
instrumentation the ground control

154
00:07:34,920 --> 00:07:30,819
system and comm which could be cameras

155
00:07:37,020 --> 00:07:34,930
and communications cables there's also

156
00:07:39,689 --> 00:07:37,030
fluid system so the fluid systems would

157
00:07:41,339 --> 00:07:39,699
include your cryogenic fuels your liquid

158
00:07:43,110 --> 00:07:41,349
oxygen your liquid hi you getting all

159
00:07:46,600 --> 00:07:43,120
flow through the

160
00:07:48,879 --> 00:07:46,610
first mass umbilical to the rocket so

161
00:07:50,020 --> 00:07:48,889
it's a lot of systems going in and then

162
00:07:52,629 --> 00:07:50,030
we have to interconnect all their

163
00:07:54,730 --> 00:07:52,639

systems so essentially we had close to

164
00:07:56,950 --> 00:07:54,740
5,000 cables that you know have to

165
00:08:00,189 --> 00:07:56,960
spiderweb their way and connect bubbles

166
00:08:01,570 --> 00:08:00,199
we have moving that runs everywhere on

167
00:08:04,089 --> 00:08:01,580
the mobile launcher I don't even know

168
00:08:06,430 --> 00:08:04,099
how many miles even quantify that but

169
00:08:08,290 --> 00:08:06,440
there's miles and miles of tubing

170
00:08:10,990 --> 00:08:08,300
connecting all these systems together

171
00:08:14,170 --> 00:08:11,000
and then there's pipe that connects the

172
00:08:15,809 --> 00:08:14,180
cryo systems all together so it was a

173
00:08:21,159 --> 00:08:15,819
it's a massive undertaking

174
00:08:22,570 --> 00:08:21,169
we are 99.9 percent there currently

175
00:08:25,120 --> 00:08:22,580
we're finishing up some structural

176
00:08:27,309 --> 00:08:25,130
modifications to a major trust that

177
00:08:30,040 --> 00:08:27,319
supports the tower the weight of the

178
00:08:32,740 --> 00:08:30,050
tower and the rocket but it's a major

179
00:08:34,300 --> 00:08:32,750
trust we found we had to go and

180
00:08:37,510 --> 00:08:34,310
reinforce that so we're wrapping that up

181
00:08:39,570 --> 00:08:37,520
now we're also we found we had some

182
00:08:42,010 --> 00:08:39,580
corrosion on some of our fire detection

183
00:08:43,630 --> 00:08:42,020
system and you know it's a very

184
00:08:45,100 --> 00:08:43,640
important system for the safety of the

185
00:08:46,900 --> 00:08:45,110
workers the crew who everybody's the

186
00:08:49,829 --> 00:08:46,910
fire detection we're wrapping that up as

187
00:08:52,120 --> 00:08:49,839
well and then we finished up our

188
00:08:53,889 --> 00:08:52,130

verification and validation testing but

189
00:08:55,810 --> 00:08:53,899
there were a few non-conformance as we

190
00:08:58,329 --> 00:08:55,820
call them or you know issues with tastic

191
00:09:01,090 --> 00:08:58,339
sure and we're wrapping up a couple of

192
00:09:03,040 --> 00:09:01,100
system that had a few problems and so

193
00:09:06,910 --> 00:09:03,050
we're wrapping things up and getting

194
00:09:08,380 --> 00:09:06,920
ready for operation man so it's

195
00:09:10,660 --> 00:09:08,390
impressive just thinking about that as

196
00:09:12,790 --> 00:09:10,670
you talk about like 5,000 cables you

197
00:09:15,130 --> 00:09:12,800
just kind of list it off like laundry

198
00:09:17,019 --> 00:09:15,140
list these systems and I think it's easy

199
00:09:18,610 --> 00:09:17,029
again to kind of overlook the complexity

200
00:09:21,190 --> 00:09:18,620
of this of you have something on the

201
00:09:24,240 --> 00:09:21,200
order of a 32 story tall building that

202
00:09:26,319 --> 00:09:24,250
you're running 5,000 cables through and

203
00:09:27,880 --> 00:09:26,329
kind of along those same lines kind of

204
00:09:29,620 --> 00:09:27,890
just the complexity and the magnitude

205
00:09:32,139 --> 00:09:29,630
here we did have a social question come

206
00:09:33,730 --> 00:09:32,149
in here how do you weigh the mobile

207
00:09:35,319 --> 00:09:33,740
launcher because ultimately like is

208
00:09:37,329 --> 00:09:35,329
there is there a point to where like

209
00:09:38,650 --> 00:09:37,339
we're kind of guessing like we're pretty

210
00:09:40,060 --> 00:09:38,660
we know it's pretty close because of the

211
00:09:42,910 --> 00:09:40,070
steel we're putting on it or do we

212
00:09:44,440 --> 00:09:42,920
actually weigh this thing somehow no we

213
00:09:46,360 --> 00:09:44,450

actually weigh it so there's a couple

214
00:09:48,490 --> 00:09:46,370
ways we weigh it first the

215
00:09:50,410 --> 00:09:48,500
crawler-transporter which is actually

216
00:09:52,030 --> 00:09:50,420
the tractor if you will that picks up

217
00:09:55,300 --> 00:09:52,040
the mobile launcher and moves it from

218
00:09:56,590 --> 00:09:55,310
the VAB to the pad so that that has

219
00:09:58,180 --> 00:09:56,600
instrumentation that allows

220
00:10:01,290 --> 00:09:58,190
the way it when it picks up the mobile

221
00:10:05,160 --> 00:10:01,300
launcher and then there you see it video

222
00:10:07,660 --> 00:10:05,170
underneath the ml and then also the

223
00:10:10,090 --> 00:10:07,670
support mounts at the pad and then the

224
00:10:12,009 --> 00:10:10,100
Vav have instrumentation on them that

225
00:10:14,530 --> 00:10:12,019
allow us to get the weight of the mobile

226
00:10:16,930 --> 00:10:14,540
launcher as well so again even that

227
00:10:19,660 --> 00:10:16,940
requiring just some incredibly complex

228
00:10:21,550 --> 00:10:19,670
equipment you can't just use your

229
00:10:23,889 --> 00:10:21,560
bathroom scale to go away a mobile

230
00:10:25,569 --> 00:10:23,899
launcher which is awesome and I'm

231
00:10:28,420 --> 00:10:25,579
assuming that it takes something of a

232
00:10:32,350 --> 00:10:28,430
small army to create this because you

233
00:10:35,019 --> 00:10:32,360
kind of again it's a 32 story tall

234
00:10:36,069 --> 00:10:35,029
building that's a engineering marvel in

235
00:10:38,319 --> 00:10:36,079
a sense because you have all these

236
00:10:39,670 --> 00:10:38,329
systems integrated into it can you spit

237
00:10:41,079 --> 00:10:39,680
blow me like how many teams are we

238
00:10:47,530 --> 00:10:41,089

talking how many people are working on

239
00:10:49,389 --> 00:10:47,540
this that's a good one so at different

240
00:10:52,240 --> 00:10:49,399
times there's different types of people

241
00:10:55,059 --> 00:10:52,250
and different teams so in the design and

242
00:10:57,550 --> 00:10:55,069
development phase which again we're

243
00:10:59,379 --> 00:10:57,560
pretty much done it had themes for all

244
00:11:02,410 --> 00:10:59,389
the different systems there was over 40

245
00:11:05,199 --> 00:11:02,420
ground support equipment systems rattled

246
00:11:07,269 --> 00:11:05,209
off a couple earlier those systems each

247
00:11:10,360 --> 00:11:07,279
had teams you know teams who provide

248
00:11:12,639 --> 00:11:10,370
analysis design for those teams project

249
00:11:14,559 --> 00:11:12,649
management for those teams so they had

250
00:11:16,480 --> 00:11:14,569
teams individually and there was overlap

251
00:11:19,780 --> 00:11:16,490
in the people some people had more than

252
00:11:25,449 --> 00:11:19,790
one system to work other work some of

253
00:11:27,999 --> 00:11:25,459
that beefy Donovan was our main

254
00:11:31,240 --> 00:11:28,009
contractor and with five subcontractors

255
00:11:32,949 --> 00:11:31,250
helping him do the grant installing all

256
00:11:37,379 --> 00:11:32,959
this equipment and all this cabling and

257
00:11:39,759 --> 00:11:37,389
at times they were up around 300 workers

258
00:11:42,900 --> 00:11:39,769
actually out on the mobile launcher

259
00:11:46,600 --> 00:11:42,910
welding putting in cables testing cables

260
00:11:49,300 --> 00:11:46,610
putting cryo systems in so up around 300

261
00:11:51,129 --> 00:11:49,310
now as we transition towards operations

262
00:11:54,220 --> 00:11:51,139
and into operations

263
00:11:55,300 --> 00:11:54,230

Jacob SAR operations contractor you know

264
00:11:56,769 --> 00:11:55,310
they have people out there doing

265
00:11:59,319 --> 00:11:56,779
operations and maintenance on all these

266
00:12:01,569 --> 00:11:59,329
systems now they're doing testing

267
00:12:03,189 --> 00:12:01,579
they're doing the flow management the

268
00:12:04,990 --> 00:12:03,199
operations management of who's doing

269
00:12:07,870 --> 00:12:05,000
what because we're now into more of an

270
00:12:08,920 --> 00:12:07,880
operational you know transitioning into

271
00:12:12,129 --> 00:12:08,930
that operational

272
00:12:14,470 --> 00:12:12,139
so I couldn't hazard a guess other than

273
00:12:15,960 --> 00:12:14,480
times it's probably going to be you know

274
00:12:19,720 --> 00:12:15,970
when we're actually stuck in the rocket

275
00:12:22,269 --> 00:12:19,730
we're gonna be in the thousand range

276
00:12:24,850 --> 00:12:22,279
we've been at many many hundreds times

277
00:12:28,329 --> 00:12:24,860
around the park site building the mobile

278
00:12:29,710 --> 00:12:28,339
launcher and in the Vav test yeah and

279
00:12:32,290 --> 00:12:29,720
you mentioned a really good point there

280
00:12:33,309 --> 00:12:32,300
about the idea of operations and I don't

281
00:12:35,139 --> 00:12:33,319
want people to take that for granted

282
00:12:37,179 --> 00:12:35,149
again so much of this is kind of putting

283
00:12:38,710 --> 00:12:37,189
things in context because we've been

284
00:12:40,119 --> 00:12:38,720
working on the development of this for

285
00:12:41,829 --> 00:12:40,129
years and then you're gonna take a

286
00:12:43,329 --> 00:12:41,839
workforce and kind of move towards

287
00:12:45,639 --> 00:12:43,339
operations as we start to see Hardware

288
00:12:47,290 --> 00:12:45,649

come in as early as this summer there's

289
00:12:51,400 --> 00:12:47,300
even some pieces that are on center now

290
00:12:53,559 --> 00:12:51,410
so as we move forward what's that like

291
00:12:55,150 --> 00:12:53,569
for that team to kind of kind of shake

292
00:12:58,079 --> 00:12:55,160
off like that okay we've designed that

293
00:13:01,299 --> 00:12:58,089
now we have to go use it to fly a rocket

294
00:13:03,999 --> 00:13:01,309
right so what I would say is we started

295
00:13:06,910 --> 00:13:04,009
this transition operations a couple

296
00:13:09,790 --> 00:13:06,920
years ago actually in in essence in

297
00:13:12,009 --> 00:13:09,800
trying to get the teams ready for when

298
00:13:13,660 --> 00:13:12,019
we hit this point in time and actually

299
00:13:15,400 --> 00:13:13,670
operating the system so we were doing

300
00:13:17,769 --> 00:13:15,410
testing out at the park site which is

301
00:13:21,220 --> 00:13:17,779
our construction area on the mobile

302
00:13:23,710 --> 00:13:21,230
launcher and the operations test teams

303
00:13:26,829 --> 00:13:23,720
would come out and do some small minor

304
00:13:29,400 --> 00:13:26,839
individual testing as we went out to the

305
00:13:31,840 --> 00:13:29,410
pad and the VAB to do our multi element

306
00:13:33,369 --> 00:13:31,850
verification and validation testing you

307
00:13:35,290 --> 00:13:33,379
know which is essentially our testing

308
00:13:38,110 --> 00:13:35,300
that we did for spore against our

309
00:13:40,269 --> 00:13:38,120
requirements those teams increased and

310
00:13:42,280 --> 00:13:40,279
they started getting more and more

311
00:13:45,160 --> 00:13:42,290
involved in actually performing the

312
00:13:47,110 --> 00:13:45,170
tests which allowed them to run their

313
00:13:49,689 --> 00:13:47,120

procedures allow them to get training on

314
00:13:52,030 --> 00:13:49,699
the systems of learn the system but now

315
00:13:54,429 --> 00:13:52,040
as we transition once we return from the

316
00:13:57,220 --> 00:13:54,439
pad back in December from our multi

317
00:14:00,579 --> 00:13:57,230
element testing and have declared that

318
00:14:02,319 --> 00:14:00,589
complete opted to we kind of flip the

319
00:14:05,379 --> 00:14:02,329
switch as a program that went to

320
00:14:08,949 --> 00:14:05,389
operations now we have a flow manager

321
00:14:12,189 --> 00:14:08,959
who and this team basically integrates

322
00:14:14,259 --> 00:14:12,199
much more highly integrated in terms of

323
00:14:16,179 --> 00:14:14,269
everybody's work when we were in

324
00:14:18,309 --> 00:14:16,189
development you know the project teams

325
00:14:20,980 --> 00:14:18,319
the mobile launcher to be a be you know

326
00:14:21,790 --> 00:14:20,990
kind of off though in their instruction

327
00:14:24,310 --> 00:14:21,800
in front of

328
00:14:26,440 --> 00:14:24,320
in their area now we're all highly

329
00:14:30,220 --> 00:14:26,450
integrated it's going into it casually

330
00:14:32,889 --> 00:14:30,230
to find you know hazardous areas the

331
00:14:35,230 --> 00:14:32,899
hazardous testing everybody can kind of

332
00:14:37,480 --> 00:14:35,240
now you know needs to be integrated and

333
00:14:39,100 --> 00:14:37,490
but that's what we're headed and you

334
00:14:41,889 --> 00:14:39,110
know procedurally everything's

335
00:14:45,550 --> 00:14:41,899
controlled procedurally as we do our

336
00:14:46,960 --> 00:14:45,560
work awesome so that's been for today

337
00:14:50,710 --> 00:14:46,970
cliff but I wanted to ask you as we get

338
00:14:52,780 --> 00:14:50,720

towards launch what is what's gonna be

339
00:14:54,009 --> 00:14:52,790
your role obviously you're kind of

340
00:14:56,110 --> 00:14:54,019
working on the project management side

341
00:14:59,050 --> 00:14:56,120
for getting this thing ready and as we

342
00:15:00,430 --> 00:14:59,060
transition to operations where are you

343
00:15:01,720 --> 00:15:00,440
gonna be when we're talking about launch

344
00:15:03,160 --> 00:15:01,730
day what are you gonna be kind of

345
00:15:06,670 --> 00:15:03,170
feeling and experiencing as we as we

346
00:15:09,190 --> 00:15:06,680
near a huge milestone for NASA good

347
00:15:15,009 --> 00:15:09,200
question um I'll go wherever they send

348
00:15:17,050 --> 00:15:15,019
me right now I'm supporting as the you

349
00:15:19,630 --> 00:15:17,060
know as the deputy to the project

350
00:15:21,340 --> 00:15:19,640
management division chief so just

351
00:15:23,740 --> 00:15:21,350
because we're entering operations does

352
00:15:27,160 --> 00:15:23,750
it mean the construction in the project

353
00:15:29,500 --> 00:15:27,170
side of the program ends and we have

354
00:15:31,150 --> 00:15:29,510
modifications to do to the mobile

355
00:15:33,639 --> 00:15:31,160
launcher to add an emergency egress

356
00:15:36,940 --> 00:15:33,649
system for the Artemis to Mission when

357
00:15:38,410 --> 00:15:36,950
we fly crew so there's work there got to

358
00:15:42,280 --> 00:15:38,420
go through the whole design development

359
00:15:44,319 --> 00:15:42,290
process there we're also putting

360
00:15:47,530 --> 00:15:44,329
environmental control systems at the pad

361
00:15:50,139 --> 00:15:47,540
and in the VAB new systems so there are

362
00:15:52,480 --> 00:15:50,149
big projects so there's plenty for me to

363
00:15:56,079 --> 00:15:52,490

do supporting my boss and all the

364
00:15:58,150 --> 00:15:56,089
project management areas and we'll keep

365
00:16:01,150 --> 00:15:58,160
on doing that so once we launch you know

366
00:16:04,389 --> 00:16:01,160
we go right back into some project

367
00:16:07,930 --> 00:16:04,399
development so it's a it's a relentless

368
00:16:08,500 --> 00:16:07,940
cycle be cool well if it sounds like

369
00:16:11,079 --> 00:16:08,510
you're having fun

370
00:16:12,639 --> 00:16:11,089
appreciate you joining us tonight and I

371
00:16:14,620 --> 00:16:12,649
wish you the best going forward and I am

372
00:16:16,260 --> 00:16:14,630
just so excited to see this thing fly

373
00:16:19,620 --> 00:16:16,270
someday very soon

374
00:16:23,130 --> 00:16:19,630
me too and I can't wait Thank You cliff

375
00:16:27,490 --> 00:16:25,269
alright so want to transition really

376
00:16:29,170 --> 00:16:27,500
fast now to some some current events

377
00:16:33,220 --> 00:16:29,180
things that are going on want to make

378
00:16:35,000 --> 00:16:33,230
sure that you are aware that we have a

379
00:16:36,800 --> 00:16:35,010
great resource available NASA

380
00:16:38,450 --> 00:16:36,810
/ NASA at home especially if you've got

381
00:16:40,550 --> 00:16:38,460
kids or if you just want some

382
00:16:43,700 --> 00:16:40,560
entertainment in general by all means

383
00:16:46,400 --> 00:16:43,710
you are welcome to check that out it's

384
00:16:47,420 --> 00:16:46,410
again a great space to find all sorts of

385
00:16:50,570 --> 00:16:47,430
cool things wanted to highlight a couple

386
00:16:53,960 --> 00:16:50,580
of those things for you right now we

387
00:16:56,480 --> 00:16:53,970
have the we'll go here first this is the

388
00:16:58,910 --> 00:16:56,490

homepage for NASA at nasa.gov slash NASA

389
00:17:01,160 --> 00:16:58,920
at home so those big tiles they're

390
00:17:03,740 --> 00:17:01,170
leading you on to kind of some specifics

391
00:17:05,990 --> 00:17:03,750
and then even more specifically today

392
00:17:08,510 --> 00:17:06,000
one of the highlight for you the stem at

393
00:17:10,790 --> 00:17:08,520
home section which is a really great

394
00:17:13,040 --> 00:17:10,800
resource for students of all ages to

395
00:17:15,760 --> 00:17:13,050
kind of learn things have fun engage

396
00:17:18,319 --> 00:17:15,770
with NASA missions and activities and

397
00:17:21,319 --> 00:17:18,329
yeah just a great experience great

398
00:17:25,250 --> 00:17:21,329
resource available also wanted to call

399
00:17:27,620 --> 00:17:25,260
out some some interesting social media

400
00:17:29,510 --> 00:17:27,630
activities this week this weekend

401
00:17:33,800 --> 00:17:29,520
actually so things are just moving so

402
00:17:35,690 --> 00:17:33,810
fast all the time we have this one which

403
00:17:39,170 --> 00:17:35,700
is a great example of kind of this

404
00:17:41,210 --> 00:17:39,180
planning happening as we proceed we're

405
00:17:42,740 --> 00:17:41,220
moving at an incredible rate so excited

406
00:17:45,760 --> 00:17:42,750
to be able to share this this past week

407
00:17:47,930 --> 00:17:45,770
this is the plan leading to our

408
00:17:49,760 --> 00:17:47,940
understanding and of what we're planning

409
00:17:51,680 --> 00:17:49,770
to do for the moon in them and going to

410
00:17:54,200 --> 00:17:51,690
Mars after we're done with the moon or

411
00:17:56,780 --> 00:17:54,210
as we as we master the moon so to speak

412
00:17:57,950 --> 00:17:56,790
so we're not just going for a short trip

413
00:18:00,260 --> 00:17:57,960

to the moon we want a sustainable

414
00:18:02,840 --> 00:18:00,270
presence we're saying 2024 we want boots

415
00:18:05,780 --> 00:18:02,850
on the moon 2028 is this a sustainable

416
00:18:07,160 --> 00:18:05,790
presence and that's with Mars our eyes

417
00:18:07,490 --> 00:18:07,170
towards Mars and so that's what this is

418
00:18:10,310 --> 00:18:07,500
about

419
00:18:11,720 --> 00:18:10,320
looking ahead towards Mars and laying

420
00:18:14,720 --> 00:18:11,730
out this roadmap for us for the future

421
00:18:17,510 --> 00:18:14,730
also another great highlight Mars 2020

422
00:18:19,190 --> 00:18:17,520
also named perseverance super excited

423
00:18:20,390 --> 00:18:19,200
about that there's actually there's a

424
00:18:23,330 --> 00:18:20,400
really cool thing happening where we're

425
00:18:25,310 --> 00:18:23,340
sending up almost 11 million names of

426
00:18:28,190 --> 00:18:25,320
people that will be going on board this

427
00:18:28,580 --> 00:18:28,200
ship here this plate they'll be going to

428
00:18:30,320 --> 00:18:28,590
Mars

429
00:18:31,910 --> 00:18:30,330
so this rover is getting ready for

430
00:18:35,480 --> 00:18:31,920
launch in July and they'll be taking

431
00:18:37,160 --> 00:18:35,490
this up to onboard now it was 5:00 to

432
00:18:38,960 --> 00:18:37,170
launch the summer all the way to Mars

433
00:18:43,130 --> 00:18:38,970
and then just release this afternoon

434
00:18:45,710 --> 00:18:43,140
some really cool imagery of an emergency

435
00:18:47,080 --> 00:18:45,720
egress test that was done for SpaceX as

436
00:18:48,620 --> 00:18:47,090
a part of the Commercial Crew program

437
00:18:50,480 --> 00:18:48,630
essentially this is

438
00:18:52,820 --> 00:18:50,490

you through the process of if there's a

439
00:18:54,740 --> 00:18:52,830
bad day to launchpad how do we know that

440
00:18:57,110 --> 00:18:54,750
our crew can get out safely and so they

441
00:18:59,120 --> 00:18:57,120
ran an end-to-end test basically from

442
00:19:01,340 --> 00:18:59,130
the top of the tower down to the ground

443
00:19:03,260 --> 00:19:01,350
and away from the launchpad to safety so

444
00:19:06,140 --> 00:19:03,270
really really cool kind of experience

445
00:19:07,130 --> 00:19:06,150
there definitely be sure to check that

446
00:19:09,590 --> 00:19:07,140
out check out all of our social media

447
00:19:13,490 --> 00:19:09,600
online there's so much going on want to

448
00:19:16,640 --> 00:19:13,500
also make sure that I plug the nasa.gov

449
00:19:18,230 --> 00:19:16,650
slash EGS that's where cliff works the

450
00:19:19,730 --> 00:19:18,240
exploration ground systems appreciate

451
00:19:22,220 --> 00:19:19,740
all their hard work getting ready for

452
00:19:24,140 --> 00:19:22,230
Artemis a ton to look at on nasa.gov in

453
00:19:26,720 --> 00:19:24,150
general but that is gonna do it for me

454
00:19:29,410 --> 00:19:26,730
tonight I wish you all the best be safe