



1  
00:00:06,230 --> 00:00:04,430  
good afternoon everybody and welcome to

2  
00:00:07,940 --> 00:00:06,240  
the Kennedy Space Center my name is

3  
00:00:09,620 --> 00:00:07,950  
Jason Townsend i'm the NASA's deputy

4  
00:00:11,180 --> 00:00:09,630  
social media manager and I'd like to

5  
00:00:13,430 --> 00:00:11,190  
welcome you to today's program for the

6  
00:00:15,470 --> 00:00:13,440  
NASA social we're here to celebrate the

7  
00:00:16,970 --> 00:00:15,480  
journey of the Atlantis space shuttle as

8  
00:00:19,160 --> 00:00:16,980  
it moves to its final home

9  
00:00:21,349 --> 00:00:19,170  
this is the last NASA social event of

10  
00:00:22,880 --> 00:00:21,359  
the space shuttle program it's kind of

11  
00:00:25,609 --> 00:00:22,890  
incredible where we've come from here

12  
00:00:28,820 --> 00:00:25,619  
it all started many many many years ago

13  
00:00:31,009 --> 00:00:28,830

in 2009 out at JPL for the very first

14  
00:00:33,049 --> 00:00:31,019  
NASA Tweetup since then we've grown and

15  
00:00:35,299 --> 00:00:33,059  
expanded from just being a Twitter based

16  
00:00:36,889 --> 00:00:35,309  
program and we include more and more

17  
00:00:39,590 --> 00:00:36,899  
people now from other platforms such as

18  
00:00:40,400 --> 00:00:39,600  
Facebook and Google+ we're excited that

19  
00:00:41,750 --> 00:00:40,410  
we're able to bring these

20  
00:00:43,580 --> 00:00:41,760  
behind-the-scenes experiences to

21  
00:00:44,990 --> 00:00:43,590  
everybody who follows us and who's our

22  
00:00:47,090 --> 00:00:45,000  
fan on all of our social media platforms

23  
00:00:48,950 --> 00:00:47,100  
it's really a chance for us to show

24  
00:00:50,600 --> 00:00:48,960  
exactly what we have going on pull that

25  
00:00:52,540 --> 00:00:50,610  
curtain back and kind of put a nice face

26  
00:00:54,260 --> 00:00:52,550  
on what we have going on here at NASA

27  
00:00:56,240 --> 00:00:54,270  
the thing that's really interesting

28  
00:00:57,500 --> 00:00:56,250  
about this is that the connections that

29  
00:00:59,689 --> 00:00:57,510  
are built in the community that's made

30  
00:01:01,369 --> 00:00:59,699  
out there on social media it is really

31  
00:01:03,170 --> 00:01:01,379  
really interesting to see exactly how

32  
00:01:05,030 --> 00:01:03,180  
the community has grown we've had over

33  
00:01:07,100 --> 00:01:05,040  
800 people who now are alumni of the

34  
00:01:08,750 --> 00:01:07,110  
NASA social program and to this day

35  
00:01:10,670 --> 00:01:08,760  
several of them are still very actively

36  
00:01:13,490 --> 00:01:10,680  
involved online and sharing the space

37  
00:01:15,560 --> 00:01:13,500  
news that we as NASA are generating it's

38  
00:01:16,910 --> 00:01:15,570

an interesting time for the agency we're

39

00:01:18,530 --> 00:01:16,920

looking at growing and going to new

40

00:01:20,690 --> 00:01:18,540

places and doing new things and

41

00:01:21,590 --> 00:01:20,700

developing new technologies so today

42

00:01:23,510 --> 00:01:21,600

we're going to share a little bit about

43

00:01:25,550 --> 00:01:23,520

what that transformation has been and

44

00:01:27,530 --> 00:01:25,560

where we're headed in the future so

45

00:01:29,359 --> 00:01:27,540

without any further ado I'd like to

46

00:01:30,679 --> 00:01:29,369

welcome everybody and first off to

47

00:01:32,569 --> 00:01:30,689

welcome you to Kennedy Space Center is

48

00:01:39,590 --> 00:01:32,579

the director of public affairs here miss

49

00:01:41,060 --> 00:01:39,600

Lisa Malone thank you Jason and it's my

50

00:01:43,399 --> 00:01:41,070

pleasure to welcome all of you here to

51  
00:01:45,679 --> 00:01:43,409  
Kennedy Space Center as Jason mentioned

52  
00:01:47,300 --> 00:01:45,689  
we've had several successful social

53  
00:01:49,340 --> 00:01:47,310  
media events here at Kennedy and

54  
00:01:51,469 --> 00:01:49,350  
everyone who comes and participates

55  
00:01:53,060 --> 00:01:51,479  
really enjoys it they'd like to learn

56  
00:01:54,770 --> 00:01:53,070  
more about Kennedy Space Center and and

57  
00:01:56,330 --> 00:01:54,780  
see what's going on here so you're gonna

58  
00:01:58,789 --> 00:01:56,340  
hear a lot and see a lot today and hope

59  
00:02:01,580 --> 00:01:58,799  
you enjoy it and please ask questions

60  
00:02:02,810 --> 00:02:01,590  
along the way and just to enjoy

61  
00:02:04,670 --> 00:02:02,820  
everything that you that you're gonna

62  
00:02:05,929 --> 00:02:04,680  
see and learn some of the things you're

63  
00:02:08,089 --> 00:02:05,939

going to hear about today in this

64

00:02:10,490 --> 00:02:08,099

briefing are about how Kennedy Space

65

00:02:12,530 --> 00:02:10,500

Center is transforming to become a

66

00:02:13,640 --> 00:02:12,540

multi-user facility and how we're going

67

00:02:16,100 --> 00:02:13,650

to be the

68

00:02:19,190 --> 00:02:16,110

militating commercial space companies to

69

00:02:21,199 --> 00:02:19,200

use the facilities here and also the

70

00:02:22,670 --> 00:02:21,209

next program that NASA has which is the

71

00:02:25,009 --> 00:02:22,680

Space Launch System you're going to hear

72

00:02:26,809 --> 00:02:25,019

a little bit about that as well and then

73

00:02:29,030 --> 00:02:26,819

you're gonna hear about a program that

74

00:02:30,649 --> 00:02:29,040

Kennedy has had for many years the

75

00:02:33,170 --> 00:02:30,659

launch services program that is still

76  
00:02:35,599 --> 00:02:33,180  
active we're launching rockets that look

77  
00:02:38,449 --> 00:02:35,609  
out into the deep space look back at

78  
00:02:41,000 --> 00:02:38,459  
Earth and course go to other planets in

79  
00:02:42,679 --> 00:02:41,010  
the case of Mars which some of you may

80  
00:02:45,289 --> 00:02:42,689  
have had there dissipated to some of

81  
00:02:47,390 --> 00:02:45,299  
those social media events as well so

82  
00:02:49,069 --> 00:02:47,400  
we'd like to start it off with a video

83  
00:07:44,809 --> 00:02:49,079  
and then we'll get right into the

84  
00:07:48,689 --> 00:07:47,189  
so today we've got several presenters

85  
00:07:50,070 --> 00:07:48,699  
who are gonna be talking some about what

86  
00:07:52,619 --> 00:07:50,080  
you've just seen in this video here

87  
00:07:54,089 --> 00:07:52,629  
first up we're gonna have Scott Colorado

88  
00:07:55,769 --> 00:07:54,099

the chief architect of the ground

89

00:07:56,909 --> 00:07:55,779

systems development operation program

90

00:08:00,499 --> 00:07:56,919

here at Kennedy Space Center to talk

91

00:08:07,469 --> 00:08:05,159

thank you okay hopefully that video was

92

00:08:10,109 --> 00:08:07,479

useful to you I understand y'all been

93

00:08:11,939 --> 00:08:10,119

around a little bit here at Kennedy VAB

94

00:08:13,649 --> 00:08:11,949

today and the visitors center later and

95

00:08:16,919 --> 00:08:13,659

around a little bit first of all my name

96

00:08:18,989 --> 00:08:16,929

is co ll o re do you're gonna see that

97

00:08:20,399 --> 00:08:18,999

again later on today my better half will

98

00:08:22,169 --> 00:08:20,409

be speaking to you as well so if that

99

00:08:24,439 --> 00:08:22,179

sounds like a coincidence we're not like

100

00:08:27,059 --> 00:08:24,449

all half named Colorado here that is

101  
00:08:28,229 --> 00:08:27,069  
it's no coincidence so and spell that

102  
00:08:30,209 --> 00:08:28,239  
right because my mom will really

103  
00:08:32,369 --> 00:08:30,219  
appreciate being they'll find me if you

104  
00:08:35,069 --> 00:08:32,379  
do any twittering or anything like that

105  
00:08:36,689 --> 00:08:35,079  
or tweeting I guess it's a great time so

106  
00:08:38,309 --> 00:08:36,699  
yeah I am the chief architect a lot of

107  
00:08:40,649 --> 00:08:38,319  
what you just saw in the video is the

108  
00:08:42,540 --> 00:08:40,659  
kind of thing that we're working on we

109  
00:08:44,699 --> 00:08:42,550  
work on launch pads if you're familiar

110  
00:08:46,769 --> 00:08:44,709  
with you know the way we're set up here

111  
00:08:48,929 --> 00:08:46,779  
it's the massive VAB that's where all

112  
00:08:50,249 --> 00:08:48,939  
the big pieces come together they get

113  
00:08:53,429 --> 00:08:50,259

stacked on what's called a mobile

114

00:08:54,720 --> 00:08:53,439

launcher a big item the original rover I

115

00:08:55,949 --> 00:08:54,730

keep saying this little Rover the

116

00:08:58,139 --> 00:08:55,959

parently he's got a lot of press in the

117

00:08:59,759 --> 00:08:58,149

last couple years which is great the big

118

00:09:02,129 --> 00:08:59,769

one that we have here the five and a

119

00:09:03,240 --> 00:09:02,139

half million pound one we developed that

120

00:09:05,069 --> 00:09:03,250

here and we're actually going to reuse

121

00:09:06,679 --> 00:09:05,079

it for the next program so kind of

122

00:09:09,300 --> 00:09:06,689

jumping out a script a little bit

123

00:09:11,160 --> 00:09:09,310

probably talk first I know you're gonna

124

00:09:14,160 --> 00:09:11,170

hear from SLS the Space Launch System

125

00:09:16,559 --> 00:09:14,170

right and I think later I heard a Ryan

126

00:09:18,179 --> 00:09:16,569

spacecraft right so I guess what I

127

00:09:20,939 --> 00:09:18,189

probably like to tell you about not to

128

00:09:22,379 --> 00:09:20,949

steal their thunder is to tell you a

129

00:09:23,759 --> 00:09:22,389

little bit about the rocket just to show

130

00:09:26,790 --> 00:09:23,769

you that it's what we call an inline

131

00:09:27,990 --> 00:09:26,800

configuration the spacecraft is in line

132

00:09:30,179 --> 00:09:28,000

with the vehicle and he'll tell you all

133

00:09:31,559 --> 00:09:30,189

about it I'm sure it is different from

134

00:09:34,079 --> 00:09:31,569

shuttle that's probably the main thing

135

00:09:35,790 --> 00:09:34,089

to cover its shuttles what we call a

136

00:09:37,410 --> 00:09:35,800

side mount when you see the big orbiter

137

00:09:40,470 --> 00:09:37,420

the spacecraft which are all here to see

138

00:09:42,449 --> 00:09:40,480

tomorrow is mounted to the external tank

139

00:09:44,610 --> 00:09:42,459

and in such a way as you see in this

140

00:09:46,079 --> 00:09:44,620

model over here you see that what we're

141

00:09:47,819 --> 00:09:46,089

dealing with now so it's dramatically

142

00:09:49,259 --> 00:09:47,829

different from that standpoint a lot of

143

00:09:51,299 --> 00:09:49,269

the same components with some sheral

144

00:09:54,000 --> 00:09:51,309

cover from our standpoint from the

145

00:09:56,190 --> 00:09:54,010

ground our main purpose in life is

146

00:09:58,110 --> 00:09:56,200

- is to convert Kennedy to support this

147

00:09:59,700 --> 00:09:58,120

rocket we're doing some other things as

148

00:10:01,590 --> 00:09:59,710

well but the main thing is to convert

149

00:10:03,510 --> 00:10:01,600

Kennedy just to launch this rocket and

150

00:10:06,750 --> 00:10:03,520

this giant mosquito that you see on here

151  
00:10:10,410 --> 00:10:06,760  
I guess that's about 12 feet long if you

152  
00:10:13,500 --> 00:10:10,420  
scaled him up looks like an old one of

153  
00:10:15,360 --> 00:10:13,510  
those monster movies so anyway this is

154  
00:10:17,820 --> 00:10:15,370  
this is the rocket we'll be launching a

155  
00:10:19,980 --> 00:10:17,830  
Space Launch System and our purpose is

156  
00:10:22,650 --> 00:10:19,990  
to transform Kennedy and I'll I'll talk

157  
00:10:24,660 --> 00:10:22,660  
a little bit about what our kind of our

158  
00:10:26,370 --> 00:10:24,670  
approach right now is in kind of a big

159  
00:10:28,290 --> 00:10:26,380  
picture from what this video showed you

160  
00:10:29,820 --> 00:10:28,300  
a little bit is our exploration

161  
00:10:31,550 --> 00:10:29,830  
enterprise we call it where we have

162  
00:10:35,700 --> 00:10:31,560  
three programs the Space Launch System

163  
00:10:37,980 --> 00:10:35,710

the Orion multi-purpose crew vehicle and

164

00:10:39,780 --> 00:10:37,990

ground systems development operations

165

00:10:42,330 --> 00:10:39,790

we're all working together to create

166

00:10:43,860 --> 00:10:42,340

this capability where as a system we can

167

00:10:46,080 --> 00:10:43,870

go virtually anywhere you know I think

168

00:10:47,670 --> 00:10:46,090

most of you or follow this kind of thing

169

00:10:50,430 --> 00:10:47,680

or familiar shuttles gone to low-earth

170

00:10:52,800 --> 00:10:50,440

orbit the last 30 plus years and that's

171

00:10:54,180 --> 00:10:52,810

been great so awesome program you know

172

00:10:55,650 --> 00:10:54,190

now that it's retired we have the money

173

00:10:56,730 --> 00:10:55,660

to develop something to go beyond that

174

00:10:59,820 --> 00:10:56,740

you're gonna hear about other low-earth

175

00:11:02,310 --> 00:10:59,830

orbit enterprises but our focus is

176

00:11:03,420 --> 00:11:02,320

beyond low-earth orbit and the ultimate

177

00:11:05,010 --> 00:11:03,430

destination if you've heard an

178

00:11:06,270 --> 00:11:05,020

administrator talk about it as Mars

179

00:11:08,340 --> 00:11:06,280

that's a big deal that's what we

180

00:11:10,020 --> 00:11:08,350

ultimately want to be we haven't yet

181

00:11:13,140 --> 00:11:10,030

determined what path will take to get

182

00:11:15,180 --> 00:11:13,150

there between now and Mars I think right

183

00:11:17,580 --> 00:11:15,190

now the the plan is to I know the plan

184

00:11:19,380 --> 00:11:17,590

is to develop the capabilities to go

185

00:11:22,350 --> 00:11:19,390

just about anywhere we can as it showed

186

00:11:24,240 --> 00:11:22,360

in the video Phobos to go back to the

187

00:11:27,150 --> 00:11:24,250

moon at least in what they call cislunar

188

00:11:29,520 --> 00:11:27,160

space where you orbit the moon various

189

00:11:31,260 --> 00:11:29,530

Nia's near Earth or asteroids or other

190

00:11:32,850 --> 00:11:31,270

opportunities so we're looking at all

191

00:11:35,130 --> 00:11:32,860

those meanwhile we're already making

192

00:11:38,070 --> 00:11:35,140

progress developing the launch pad the

193

00:11:39,420 --> 00:11:38,080

Vehicle Assembly Building the mobile

194

00:11:41,370 --> 00:11:39,430

launcher which I'll talk a little bit

195

00:11:42,900 --> 00:11:41,380

about did you see the MLPs today by

196

00:11:44,790 --> 00:11:42,910

chance the mobile launch platforms they

197

00:11:46,410 --> 00:11:44,800

might want the big steel structures we

198

00:11:47,910 --> 00:11:46,420

had three of those four shuttle had kind

199

00:11:50,490 --> 00:11:47,920

of a higher flight rate we flew more

200

00:11:52,650 --> 00:11:50,500

often what we're now building if you saw

201  
00:11:54,150 --> 00:11:52,660  
the big one north of the VAB have no

202  
00:11:56,220 --> 00:11:54,160  
idea what direction it is from this room

203  
00:11:58,860 --> 00:11:56,230  
but somewhere outside here the big tower

204  
00:12:00,660 --> 00:11:58,870  
that's just outside the VAB that's what

205  
00:12:03,090 --> 00:12:00,670  
we actually originally built that for

206  
00:12:04,560 --> 00:12:03,100  
Ares one since that program was

207  
00:12:06,210 --> 00:12:04,570  
cancelled now we're converting it for

208  
00:12:06,750 --> 00:12:06,220  
the Space Launch System so excited about

209  
00:12:08,280 --> 00:12:06,760  
that

210  
00:12:09,780 --> 00:12:08,290  
kind of a big five we'd like to talk

211  
00:12:11,790 --> 00:12:09,790  
about which is the mobile launcher it's

212  
00:12:16,170 --> 00:12:11,800  
a kind of the key piece the other four

213  
00:12:17,340 --> 00:12:16,180

the launch pad 39b the VAB the always

214

00:12:18,930 --> 00:12:17,350

lose these and have to write them down

215

00:12:20,730 --> 00:12:18,940

to myself and I get in front of people

216

00:12:22,800 --> 00:12:20,740

all the crawler-transporter

217

00:12:24,720 --> 00:12:22,810

and the firing room out of those big

218

00:12:27,150 --> 00:12:24,730

five four of those we're designing is

219

00:12:30,180 --> 00:12:27,160

multi-purpose so virtually any rocket

220

00:12:31,439 --> 00:12:30,190

that looks anything like this would be

221

00:12:33,389 --> 00:12:31,449

able to launch from Kennedy and so

222

00:12:34,949 --> 00:12:33,399

that's really our focus now is make it

223

00:12:36,269 --> 00:12:34,959

evolvable because I'm sure I'll tell you

224

00:12:38,610 --> 00:12:36,279

about how this will evolve from

225

00:12:40,139 --> 00:12:38,620

different configurations but we also

226

00:12:41,910 --> 00:12:40,149

want to be able to support other users

227

00:12:43,680 --> 00:12:41,920

could as of now we're launching this

228

00:12:45,900 --> 00:12:43,690

less often than we like and certainly

229

00:12:47,639 --> 00:12:45,910

less often than shuttle so our plan is

230

00:12:51,000 --> 00:12:47,649

to fill those gaps with other users

231

00:12:52,410 --> 00:12:51,010

potentially we're also developing at

232

00:12:54,300 --> 00:12:52,420

least we have plans to develop we're in

233

00:12:56,220 --> 00:12:54,310

the design of the shuttle landing

234

00:12:58,170 --> 00:12:56,230

facility for familiar with that slf

235

00:13:00,750 --> 00:12:58,180

where shuttle landed all those years

236

00:13:01,980 --> 00:13:00,760

that that job is now done we're looking

237

00:13:03,629 --> 00:13:01,990

at converting that we actually already

238

00:13:05,699 --> 00:13:03,639

have one user signed up so they're

239

00:13:07,710 --> 00:13:05,709

actually going to be doing the future is

240

00:13:09,150 --> 00:13:07,720

now kind of thing we're horizontal

241

00:13:11,189 --> 00:13:09,160

launches and landings will be occurring

242

00:13:12,600 --> 00:13:11,199

out there we have one user signed up

243

00:13:14,910 --> 00:13:12,610

officially and we're working on three or

244

00:13:17,009 --> 00:13:14,920

four others so a lot of people think

245

00:13:18,870 --> 00:13:17,019

about 39 a and B if once you get

246

00:13:22,079 --> 00:13:18,880

familiar with Kennedy that's kind of our

247

00:13:23,579 --> 00:13:22,089

main area our flagship launch sites but

248

00:13:25,800 --> 00:13:23,589

we're really looking at turning the slf

249

00:13:27,569 --> 00:13:25,810

into a third one so we're excited about

250

00:13:30,449 --> 00:13:27,579

that as well and so again we're

251

00:13:32,309 --> 00:13:30,459

converting to a multi-use capability

252

00:13:33,990 --> 00:13:32,319

it's a term we use you know we really

253

00:13:36,420 --> 00:13:34,000

were shuttle focus for the last thirty

254

00:13:38,400 --> 00:13:36,430

years now we want to allow ourselves to

255

00:13:41,699 --> 00:13:38,410

think about other things and commercial

256

00:13:43,290 --> 00:13:41,709

users from any other program are able to

257

00:13:48,150 --> 00:13:43,300

come here and ask for our services and

258

00:13:49,470 --> 00:13:48,160

we think we can provide that so I don't

259

00:13:51,210 --> 00:13:49,480

know is it - already to answer questions

260

00:13:56,460 --> 00:13:51,220

I got some more things to say but you

261

00:14:06,420 --> 00:14:04,500

oh yeah it's so it's official in spoke

262

00:14:08,940 --> 00:14:06,430

as a company called XCore it's a

263

00:14:11,400 --> 00:14:08,950

horizontal launcher and it's basically a

264

00:14:13,920 --> 00:14:11,410

fully reusable single stage to

265

00:14:16,410 --> 00:14:13,930

suborbital vehicle and they're already

266

00:14:19,100 --> 00:14:16,420

test flying various configurations out

267

00:14:21,390 --> 00:14:19,110

in Mojave spaceport in California and

268

00:14:22,770 --> 00:14:21,400

they've officially signed I'm not sure

269

00:14:24,570 --> 00:14:22,780

exactly how the agreements written but

270

00:14:26,880 --> 00:14:24,580

they're officially signed with coming to

271

00:14:28,440 --> 00:14:26,890

Florida with combination of space

272

00:14:30,090 --> 00:14:28,450

Florida and Kennedy Space Center so

273

00:14:31,260 --> 00:14:30,100

we've actually got an office here called

274

00:14:33,420 --> 00:14:31,270

the center planning and development

275

00:14:35,190 --> 00:14:33,430

office we work closely with them and

276

00:14:37,500 --> 00:14:35,200

they nurture those capabilities and

277

00:14:38,640 --> 00:14:37,510

XCore is the first one and I can tell

278

00:14:40,140 --> 00:14:38,650

you I think it's pretty public there's

279

00:14:41,940 --> 00:14:40,150

some others like straddle launch is one

280

00:14:43,890 --> 00:14:41,950

that's talking to us and there are

281

00:14:48,330 --> 00:14:43,900

others out there that are considering

282

00:14:51,870 --> 00:14:50,310

any other question I've got I've got one

283

00:14:53,760 --> 00:14:51,880

if you if you run if you don't have any

284

00:14:56,910 --> 00:14:53,770

I can feel I can feel my own time if

285

00:14:57,360 --> 00:14:56,920

needed hey thanks for spending time with

286

00:14:59,040 --> 00:14:57,370

us today

287

00:15:02,160 --> 00:14:59,050

I guess a question for you in the ground

288

00:15:04,620 --> 00:15:02,170

systems work that's going on what do you

289

00:15:06,930 --> 00:15:04,630

see the biggest challenge for the

290

00:15:10,440 --> 00:15:06,940

program between now and 2017 with the

291

00:15:12,510 --> 00:15:10,450

targeted block one launch of SLS I think

292

00:15:15,090 --> 00:15:12,520

the the biggest challenge has to be

293

00:15:17,340 --> 00:15:15,100

affordability and that's really our our

294

00:15:19,680 --> 00:15:17,350

goal is to make this more affordable you

295

00:15:22,230 --> 00:15:19,690

know government is not known you know

296

00:15:24,750 --> 00:15:22,240

quite honestly to be efficient or to be

297

00:15:27,720 --> 00:15:24,760

cheap I guess or efficient we're more

298

00:15:29,550 --> 00:15:27,730

optimized around being fair so trying to

299

00:15:32,340 --> 00:15:29,560

be efficient and fair at the same time

300

00:15:34,020 --> 00:15:32,350

it's tough we've got an expression we

301

00:15:35,730 --> 00:15:34,030

use a lot you'll hear a lot come flat is

302

00:15:37,920 --> 00:15:35,740

a new up that's our that's our budget

303

00:15:40,380 --> 00:15:37,930

now and honestly flat is almost the new

304

00:15:41,700 --> 00:15:40,390

down because we're down is the new up so

305

00:15:43,830 --> 00:15:41,710

to speak because correcting for

306

00:15:46,230 --> 00:15:43,840

inflation we're actually losing over

307

00:15:47,700 --> 00:15:46,240

time as far as what our budget is but so

308

00:15:48,930 --> 00:15:47,710

you traditionally and I don't know if I

309

00:15:50,850 --> 00:15:48,940

guess y'all can see this and I guess

310

00:15:52,440 --> 00:15:50,860

we're used to talking on telecoms and

311

00:15:55,860 --> 00:15:52,450

making hands and nobody can see them but

312

00:15:57,870 --> 00:15:55,870

a traditional development curve has a

313

00:15:59,130 --> 00:15:57,880

big spike in it where you develop doing

314

00:16:01,110 --> 00:15:59,140

what we're doing now it's not much you

315

00:16:02,580 --> 00:16:01,120

see and people you know by the way think

316

00:16:03,840 --> 00:16:02,590

we're closed out here which couldn't be

317

00:16:05,430 --> 00:16:03,850

further from the truth we get that

318

00:16:07,500 --> 00:16:05,440

question a lot so anything y'all can do

319

00:16:09,000 --> 00:16:07,510

to dispel that myth I hope you're seeing

320

00:16:10,740 --> 00:16:09,010

a lot of progress going on out here

321

00:16:13,770 --> 00:16:10,750

but what you'd like to have in the

322

00:16:15,780 --> 00:16:13,780

initial part of a program is a nice big

323

00:16:17,790 --> 00:16:15,790

spike to develop the facilities develop

324

00:16:19,290 --> 00:16:17,800

the rocket develop the spacecraft

325

00:16:21,660 --> 00:16:19,300

everything and then it smoothes out and

326

00:16:22,770 --> 00:16:21,670

operationally you can kind of flap now

327

00:16:25,170 --> 00:16:22,780

to get into more your long-term

328

00:16:27,360 --> 00:16:25,180

recurring cost but we've been given this

329

00:16:30,000 --> 00:16:27,370

flat as the new up kind of thing and so

330

00:16:31,560 --> 00:16:30,010

we're having to develop more serially

331

00:16:34,010 --> 00:16:31,570

than we'd like we'd like to just hit it

332

00:16:36,420 --> 00:16:34,020

and hit it hard and be done with it but

333

00:16:39,300 --> 00:16:36,430

the way it's set up is we don't launch

334

00:16:40,860 --> 00:16:39,310

till 2017 so basically our our budget is

335

00:16:42,720 --> 00:16:40,870

flat and tilt in so we'll develop

336

00:16:45,930 --> 00:16:42,730

between now and then but that's easily

337

00:16:47,850 --> 00:16:45,940

the biggest challenge is making it come

338

00:16:50,010 --> 00:16:47,860

in on on budget and then right behind

339

00:16:51,600 --> 00:16:50,020

that is schedule because schedule is

340

00:16:58,190 --> 00:16:51,610

very important to us we got we have to

341

00:17:02,070 --> 00:17:00,450

anybody will know how much the crawler

342

00:17:04,319 --> 00:17:02,080

can pick up that was once always a good

343

00:17:06,390 --> 00:17:04,329

one you know do you want to know anybody

344

00:17:07,980 --> 00:17:06,400

okay not it can't be a NASA employee

345

00:17:10,740 --> 00:17:07,990

that's asking me a question I don't

346

00:17:12,449 --> 00:17:10,750

think I think that's illegal now that is

347

00:17:14,340 --> 00:17:12,459

one count of G with I always have people

348

00:17:15,840 --> 00:17:14,350

guess and they'll guess about 300

349

00:17:17,699 --> 00:17:15,850

thousand pounds or may you know a big

350

00:17:20,010 --> 00:17:17,709

one or fifty tons or something but we

351  
00:17:21,390 --> 00:17:20,020  
rolled out shuttle on an MLP and all the

352  
00:17:23,490 --> 00:17:21,400  
way back to Saturn which is the same

353  
00:17:25,020 --> 00:17:23,500  
crawler that we have today right around

354  
00:17:26,760 --> 00:17:25,030  
twelve million pounds is what we have to

355  
00:17:29,100 --> 00:17:26,770  
pick up for the crawler and the cool

356  
00:17:31,020 --> 00:17:29,110  
factor here with the SLS it's a bigger

357  
00:17:33,600 --> 00:17:31,030  
vehicle it's bigger rocket it's heavier

358  
00:17:34,650 --> 00:17:33,610  
weight more on the launcher to support

359  
00:17:37,500 --> 00:17:34,660  
all that and we're actually designing

360  
00:17:39,960 --> 00:17:37,510  
redesigning crawler 2 to crawler crawler

361  
00:17:42,360 --> 00:17:39,970  
2 is being redesigned to handle 18

362  
00:17:44,340 --> 00:17:42,370  
million pounds so so it's another 50%

363  
00:17:45,810 --> 00:17:44,350

more capacity and kind of like that a

364

00:17:47,910 --> 00:17:45,820

lot of things we're doing clean pad

365

00:17:50,510 --> 00:17:47,920

where we're making it very generic the

366

00:17:52,770 --> 00:17:50,520

plan is to make everything just is

367

00:17:54,150 --> 00:17:52,780

capable as possible so that another

368

00:17:56,310 --> 00:17:54,160

vehicle comes along we don't have to

369

00:17:58,050 --> 00:17:56,320

make any big changes okay there's a

370

00:18:07,770 --> 00:17:58,060

question I guess I can't ask my own

371

00:18:14,540 --> 00:18:11,460

on 39b and and i suppose maybe

372

00:18:20,430 --> 00:18:14,550

eventually 39a do you actually have any

373

00:18:21,390 --> 00:18:20,440

known interested customers or users in

374

00:18:25,440 --> 00:18:21,400

addition to nasa

375

00:18:26,790 --> 00:18:25,450

for either 39a and 39b yeah we have now

376

00:18:28,850 --> 00:18:26,800

those we're not we can't really talk

377

00:18:31,140 --> 00:18:28,860

about but it's known and interested yeah

378

00:18:33,420 --> 00:18:31,150

approved you know that's that's a bigger

379

00:18:35,430 --> 00:18:33,430

because it's it's actually somewhat

380

00:18:37,680 --> 00:18:35,440

revolutionary to design a multi-use

381

00:18:40,560 --> 00:18:37,690

launchpad at that scale you know we're

382

00:18:42,270 --> 00:18:40,570

talking you know our marshall guys call

383

00:18:44,340 --> 00:18:42,280

us a heavy-lift this is really a super

384

00:18:46,200 --> 00:18:44,350

heavy lift way bigger than anything we

385

00:18:49,080 --> 00:18:46,210

do around here we've ever done other

386

00:18:50,670 --> 00:18:49,090

than Saturn 5 really and so to do

387

00:18:52,830 --> 00:18:50,680

something like this multi-use on that

388

00:18:55,020 --> 00:18:52,840

scale is pretty novel in the comfort

389

00:18:56,100 --> 00:18:55,030

level and you know lining up everything

390

00:18:57,990 --> 00:18:56,110

at the right time and the right

391

00:19:00,060 --> 00:18:58,000

opportunities it's tough but we are

392

00:19:01,860 --> 00:19:00,070

talking to several companies about it we

393

00:19:04,440 --> 00:19:01,870

have been and will continue to do we

394

00:19:06,690 --> 00:19:04,450

don't have anybody signed up yet but we

395

00:19:09,480 --> 00:19:06,700

expect to and just for your information

396

00:19:11,850 --> 00:19:09,490

those at artists familiars James is 39a

397

00:19:13,800 --> 00:19:11,860

is instilling shuttle configuration if

398

00:19:15,060 --> 00:19:13,810

you went out there you see the rotating

399

00:19:17,040 --> 00:19:15,070

service structure fixed service

400

00:19:18,780 --> 00:19:17,050

structure you know all the shuttle

401  
00:19:20,970 --> 00:19:18,790  
specific capabilities we're leaving

402  
00:19:22,110 --> 00:19:20,980  
those in place there's a way we're doing

403  
00:19:24,630 --> 00:19:22,120  
a lot of things is we're leaving

404  
00:19:27,060 --> 00:19:24,640  
essentially one string and shuttle

405  
00:19:29,880 --> 00:19:27,070  
configuration and one we're rehaul and

406  
00:19:31,440 --> 00:19:29,890  
for overhauling for SLS and so there's

407  
00:19:33,230 --> 00:19:31,450  
depending on the company and what their

408  
00:19:35,730 --> 00:19:33,240  
use is they're more interested in a or b

409  
00:19:39,240 --> 00:19:35,740  
so we're still talking but we have

410  
00:19:41,490 --> 00:19:39,250  
nobody signed up yet if you elaborate

411  
00:19:43,710 --> 00:19:41,500  
any on 39a and you've talked about that

412  
00:19:46,670 --> 00:19:43,720  
or KSC has talked about that as that's

413  
00:19:49,710 --> 00:19:46,680

becoming a quote unquote commercial path

414

00:19:53,040 --> 00:19:49,720

in what way will you make that that pad

415

00:19:56,700 --> 00:19:53,050

available to other users will it be

416

00:19:58,290 --> 00:19:56,710

given to a company that steps forward to

417

00:20:02,670 --> 00:19:58,300

ask for it or is it is it also a

418

00:20:04,560 --> 00:20:02,680

multi-use ban it's for CP do I think I

419

00:20:06,060 --> 00:20:04,570

can wing it a little bit I mean it's it

420

00:20:08,430 --> 00:20:06,070

would it would also be multi-use

421

00:20:10,620 --> 00:20:08,440

presumably I mean we you know one thing

422

00:20:12,630 --> 00:20:10,630

about it took us about five or six years

423

00:20:14,340 --> 00:20:12,640

to build 39a in the first place and that

424

00:20:16,710 --> 00:20:14,350

was back in the 60s when you just said

425

00:20:18,180 --> 00:20:16,720

free reign on budget and environmental

426

00:20:20,010 --> 00:20:18,190

concerns and also we're really humping

427

00:20:21,600 --> 00:20:20,020

it to get it built so we don't want to

428

00:20:23,250 --> 00:20:21,610

we don't want to repeat that again so we

429

00:20:25,320 --> 00:20:23,260

treasure those two even though we don't

430

00:20:27,360 --> 00:20:25,330

need two launch pads for SLS because the

431

00:20:30,180 --> 00:20:27,370

flight rates lower we aren't holding on

432

00:20:31,919 --> 00:20:30,190

to both of them to some extent but so

433

00:20:33,960 --> 00:20:31,929

that so they are talking agreements and

434

00:20:36,750 --> 00:20:33,970

things like that but we we want to be as

435

00:20:40,940 --> 00:20:36,760

flexible as possible so I would say that

436

00:20:43,500 --> 00:20:40,950

more than likely it would be multiple

437

00:20:45,360 --> 00:20:43,510

open to multiple users and I don't know

438

00:20:47,840 --> 00:20:45,370

how the specific agreements and I would

439

00:20:49,980 --> 00:20:47,850

be written but we're not inclined to

440

00:20:53,669 --> 00:20:49,990

dedicate it to one thing and forevermore

441

00:20:55,140 --> 00:20:53,679

be that uh I think our our gut feel is

442

00:20:58,950 --> 00:20:55,150

that we need to keep it as open as

443

00:21:00,510 --> 00:20:58,960

possible so again I would say virtually

444

00:21:02,400 --> 00:21:00,520

everything the crawler the firing rooms

445

00:21:03,720 --> 00:21:02,410

the launch pads for the most part the

446

00:21:05,610 --> 00:21:03,730

mobile launcher is the one thing that

447

00:21:07,320 --> 00:21:05,620

just to kind of go back to that it's so

448

00:21:09,390 --> 00:21:07,330

close to the vehicle and has to be so

449

00:21:11,160 --> 00:21:09,400

specific to the vehicles needs that's

450

00:21:13,470 --> 00:21:11,170

the one thing we struggle with to being

451  
00:21:15,240 --> 00:21:13,480  
as open and generic and multi-purpose is

452  
00:21:17,040 --> 00:21:15,250  
everything else but everything else

453  
00:21:18,180 --> 00:21:17,050  
we're going to try to keep that way now

454  
00:21:20,220 --> 00:21:18,190  
if it comes a point in time where it

455  
00:21:28,140 --> 00:21:20,230  
makes more sense to dedicate it we may

456  
00:21:30,330 --> 00:21:28,150  
do that so okay wanting more partners

457  
00:21:32,100 --> 00:21:30,340  
with the launch capability are you

458  
00:21:33,680 --> 00:21:32,110  
looking at specifically us-based are you

459  
00:21:36,030 --> 00:21:33,690  
also looking at international partners

460  
00:21:38,520 --> 00:21:36,040  
when you say looked at we we wait till

461  
00:21:40,860 --> 00:21:38,530  
they come to us we put out or actually

462  
00:21:43,050 --> 00:21:40,870  
RC video friends put out a notice of

463  
00:21:44,370 --> 00:21:43,060

availability it's called and various

464

00:21:46,590 --> 00:21:44,380

things to tell the world that we're

465

00:21:49,290 --> 00:21:46,600

available so far they've only been

466

00:21:51,240 --> 00:21:49,300

domestic but if an international came to

467

00:21:52,800 --> 00:21:51,250

us we would be open to that I mean

468

00:21:54,750 --> 00:21:52,810

obviously it'd be more complicated and

469

00:21:57,690 --> 00:21:54,760

you know relations and things like that

470

00:21:59,400 --> 00:21:57,700

but physically like I say we're trying

471

00:22:01,020 --> 00:21:59,410

to build this and just to highlight a

472

00:22:02,220 --> 00:22:01,030

couple of that you said last question so

473

00:22:06,090 --> 00:22:02,230

I can make my answer as long as I want

474

00:22:07,260 --> 00:22:06,100

right buy more time that way but one of

475

00:22:08,910 --> 00:22:07,270

the things you'll notice if you go by

476  
00:22:10,230 --> 00:22:08,920  
the pad we what we call the universal

477  
00:22:12,570 --> 00:22:10,240  
lightning protection system there's

478  
00:22:14,850 --> 00:22:12,580  
three towers and catenary wires that

479  
00:22:16,740 --> 00:22:14,860  
provide a Faraday cage protection that

480  
00:22:18,390 --> 00:22:16,750  
protects any rocket even bigger than

481  
00:22:20,460 --> 00:22:18,400  
this on down basically if it rolls out

482  
00:22:22,200 --> 00:22:20,470  
of the VAB we can protect it with the

483  
00:22:24,690 --> 00:22:22,210  
lightning protection we've also just

484  
00:22:27,060 --> 00:22:24,700  
been able to officially say that we've

485  
00:22:28,560 --> 00:22:27,070  
designed a multi-use or a universal

486  
00:22:29,930 --> 00:22:28,570  
flame deflector which is kind of a big

487  
00:22:31,980 --> 00:22:29,940  
deal at the bottom of the rocket

488  
00:22:32,910 --> 00:22:31,990

especially the big Rockets they need a

489

00:22:35,340 --> 00:22:32,920

lot of

490

00:22:36,840 --> 00:22:35,350

directional thrusts help so you don't

491

00:22:38,400 --> 00:22:36,850

want to just reverberating and creating

492

00:22:39,750 --> 00:22:38,410

a pressure wave and foreign object

493

00:22:41,940 --> 00:22:39,760

debris and all that coming back at the

494

00:22:43,710 --> 00:22:41,950

rocket so for the first time as far as

495

00:22:45,690 --> 00:22:43,720

we know and particularly on this scale

496

00:22:47,820 --> 00:22:45,700

we designed it to be Universal so

497

00:22:50,070 --> 00:22:47,830

practically any vehicle could launch off

498

00:22:52,710 --> 00:22:50,080

the pad and be fun so those kind of

499

00:22:54,810 --> 00:22:52,720

things we think will and enhance the

500

00:22:56,610 --> 00:22:54,820

capability that virtually any rocket at

501  
00:23:01,010 --> 00:22:56,620  
least a vertically launch rocket would

502  
00:23:15,510 --> 00:23:14,070  
okay all right so I hope everybody's

503  
00:23:17,670 --> 00:23:15,520  
following along online if you are a

504  
00:23:20,580 --> 00:23:17,680  
hashtag for today's event is pound NASA

505  
00:23:22,050 --> 00:23:20,590  
social and you can also use for the

506  
00:23:23,130 --> 00:23:22,060  
Atlantis move that's happening tomorrow

507  
00:23:25,170 --> 00:23:23,140  
and everything you can use pound

508  
00:23:27,300 --> 00:23:25,180  
Atlantis and we are streaming this

509  
00:23:28,740 --> 00:23:27,310  
online on the media channel of NASA

510  
00:23:31,530 --> 00:23:28,750  
television so hopefully you guys are

511  
00:23:33,450 --> 00:23:31,540  
watching online as well next up we have

512  
00:23:35,580 --> 00:23:33,460  
Tom herb Minh he's the deputy manager of

513  
00:23:40,950 --> 00:23:35,590

the Space Launch System resident office

514

00:23:44,880 --> 00:23:40,960

here at Kennedy Space Center so tom well

515

00:23:46,440 --> 00:23:44,890

thank you all for coming so I've been

516

00:23:48,840 --> 00:23:46,450

working for NASA a little over 20 years

517

00:23:50,940 --> 00:23:48,850

I've been fortunate enough to work on

518

00:23:52,890 --> 00:23:50,950

the space shuttle and also International

519

00:23:54,810 --> 00:23:52,900

Space Station's a number of payloads

520

00:23:57,930 --> 00:23:54,820

that have flown and so now we're

521

00:24:00,120 --> 00:23:57,940

starting to look at the SLS vehicle yes

522

00:24:02,280 --> 00:24:00,130

a bad boy this is gonna be bigger than

523

00:24:05,100 --> 00:24:02,290

any rocket by far we've ever built in us

524

00:24:07,830 --> 00:24:05,110

in this country in the world and we're

525

00:24:10,980 --> 00:24:07,840

trying to focus 100% on affordability

526

00:24:12,780 --> 00:24:10,990

and sustainability so we first talked

527

00:24:15,620 --> 00:24:12,790

about affordability you know trying to

528

00:24:18,630 --> 00:24:15,630

keep within a Scott set a flat budget or

529

00:24:20,850 --> 00:24:18,640

reducing budget we try to leverage off

530

00:24:22,680 --> 00:24:20,860

the old shuttle hardware knowledge we've

531

00:24:25,050 --> 00:24:22,690

done and you can see here the shuttle is

532

00:24:26,880 --> 00:24:25,060

two solid rocket boosters they're four

533

00:24:29,010 --> 00:24:26,890

segments so we're gonna look at for the

534

00:24:30,780 --> 00:24:29,020

SLS we're gonna have two solid rocket

535

00:24:32,400 --> 00:24:30,790

boosters that are five segments so

536

00:24:34,770 --> 00:24:32,410

increase the thrust and the performance

537

00:24:36,930 --> 00:24:34,780

of the vehicle Space Shuttle main

538

00:24:39,150 --> 00:24:36,940

engines rs.25 engines you have three of

539

00:24:41,430 --> 00:24:39,160

them on the shuttle here we're gonna

540

00:24:44,820 --> 00:24:41,440

leverage off that I'm gonna four rs.25

541

00:24:46,710 --> 00:24:44,830

engines the external tank we're using

542

00:24:48,779 --> 00:24:46,720

the same facility up and miss you

543

00:24:51,330 --> 00:24:48,789

to use the same technology in the same

544

00:24:52,799 --> 00:24:51,340

resources to build the core stage here

545

00:24:54,930 --> 00:24:52,809

the course age it's going to be

546

00:24:58,529 --> 00:24:54,940

redesigned by Boeing the contracts being

547

00:25:00,600 --> 00:24:58,539

reviewed now and then for the upper

548

00:25:03,180 --> 00:25:00,610

stage we're leveraging off the Delta for

549

00:25:05,250 --> 00:25:03,190

the Delta for ICPs it's called the

550

00:25:08,039 --> 00:25:05,260

interim cryogenic propulsion system

551  
00:25:11,279 --> 00:25:08,049  
we're going to modify that two-man rate

552  
00:25:13,919 --> 00:25:11,289  
it so that'll be a first block one

553  
00:25:15,810 --> 00:25:13,929  
engine they call POC one rocket that

554  
00:25:18,000 --> 00:25:15,820  
will make it sustainable so we'll

555  
00:25:20,610 --> 00:25:18,010  
upgrade it over time and eventually

556  
00:25:22,830 --> 00:25:20,620  
we'll change out we have a RFP out now

557  
00:25:24,990 --> 00:25:22,840  
for advanced boosters to give us again

558  
00:25:28,080 --> 00:25:25,000  
more thrust the upper stage will be

559  
00:25:30,630 --> 00:25:28,090  
changed to a j-2x engine to give us more

560  
00:25:32,880 --> 00:25:30,640  
capability and the final goal is to be

561  
00:25:37,350 --> 00:25:32,890  
able to launch up to 130 metric tonnes

562  
00:25:39,120 --> 00:25:37,360  
in the low-earth orbit and if you look

563  
00:25:41,370 --> 00:25:39,130

at the power that this that she's gonna

564

00:25:44,159 --> 00:25:41,380

be able put out you talked about 8.4

565

00:25:45,779 --> 00:25:44,169

million pounds of thrust at liftoff and

566

00:25:47,820 --> 00:25:45,789

try to put that in perspective for all

567

00:25:49,529 --> 00:25:47,830

the car buffs out there that's

568

00:25:52,470 --> 00:25:49,539

equivalent to about a hundred and sixty

569

00:25:56,190 --> 00:25:52,480

thousand Corvette engines firing all at

570

00:25:59,340 --> 00:25:56,200

the same time and the common question is

571

00:26:01,799 --> 00:25:59,350

why do we want SLS what is SLS ba why is

572

00:26:03,870 --> 00:26:01,809

America going to invest this money in

573

00:26:05,520 --> 00:26:03,880

this vehicle you know right now we have

574

00:26:07,169 --> 00:26:05,530

as you'll hear the Commercial Crew folks

575

00:26:08,700 --> 00:26:07,179

they're gonna be launching folks into

576

00:26:10,200 --> 00:26:08,710

low-earth orbit you know they get up to

577

00:26:13,770 --> 00:26:10,210

the space station space station any

578

00:26:15,720 --> 00:26:13,780

given times between 220 230 miles above

579

00:26:18,450 --> 00:26:15,730

Earth orbit you know but if you want to

580

00:26:21,450 --> 00:26:18,460

go in a deep space you need a big rocket

581

00:26:23,880 --> 00:26:21,460

to launch large mass if you want to go

582

00:26:25,680 --> 00:26:23,890

to the moon moon somewhere around 220

583

00:26:27,659 --> 00:26:25,690

230 thousand miles

584

00:26:30,390 --> 00:26:27,669

now Scott said if you want to go to Mars

585

00:26:32,700 --> 00:26:30,400

which NASA administrators keeps talking

586

00:26:35,850 --> 00:26:32,710

about that's approximately 23 million

587

00:26:43,360 --> 00:26:35,860

miles from Earth and so that's a quite a

588

00:26:54,970 --> 00:26:50,080

that makes it easy know how much of the

589

00:27:00,160 --> 00:26:54,980

SLS is reusable or recoverable just the

590

00:27:01,600 --> 00:27:00,170

Orion spacecraft is recoverable are you

591

00:27:05,020 --> 00:27:01,610

going to reuse it or is that just a

592

00:27:06,670 --> 00:27:05,030

one-time use only it's reusable you know

593

00:27:08,620 --> 00:27:06,680

again it's a three program system

594

00:27:10,720 --> 00:27:08,630

Marshalls responsible for the vehicle

595

00:27:13,270 --> 00:27:10,730

JSC is responsible for the Orion

596

00:27:15,430 --> 00:27:13,280

spacecraft on the main portion so Ryan's

597

00:27:23,580 --> 00:27:15,440

spacecraft will splash down and will be

598

00:27:26,620 --> 00:27:23,590

reusable reusable don't you reuse the

599

00:27:28,810 --> 00:27:26,630

Boosters because you did reuse them for

600

00:27:30,610 --> 00:27:28,820

the shuttle system we reuse the boosters

601  
00:27:32,860 --> 00:27:30,620  
on space shuttle

602  
00:27:38,049 --> 00:27:32,870  
but for SLS we have no plans to reuse

603  
00:27:39,340 --> 00:27:38,059  
them the five stages we looked at you

604  
00:27:42,070 --> 00:27:39,350  
know again we're going to go to a new

605  
00:27:44,470 --> 00:27:42,080  
upgraded booster format so we have

606  
00:27:46,810 --> 00:27:44,480  
enough hardware left over from the space

607  
00:27:48,520 --> 00:27:46,820  
shuttle to do our first two launches

608  
00:27:55,120 --> 00:27:48,530  
using the Boosters we currently have and

609  
00:27:57,100 --> 00:27:55,130  
there's no benefit to reuse them I got a

610  
00:28:01,030 --> 00:27:57,110  
question for you here it's a Hello

611  
00:28:02,560 --> 00:28:01,040  
this rocket compared to the Saturn 5 SLS

612  
00:28:04,810 --> 00:28:02,570  
when I say it's the biggest rocket it's

613  
00:28:08,290 --> 00:28:04,820

about 10 percent more thrust at liftoff

614

00:28:10,690 --> 00:28:08,300

than the Saturn 5 was to this quite a

615

00:28:12,220 --> 00:28:10,700

bit more capable than that you know we

616

00:28:14,320 --> 00:28:12,230

try to make it sustainable again the

617

00:28:17,230 --> 00:28:14,330

payload fairing so you know right now we

618

00:28:19,030 --> 00:28:17,240

have Orion in there but we want to have

619

00:28:21,010 --> 00:28:19,040

it so you could launch large telescopes

620

00:28:23,799 --> 00:28:21,020

of large science missions to Jupiter

621

00:28:25,570 --> 00:28:23,809

Saturn whatever it's trying to make it

622

00:28:27,330 --> 00:28:25,580

as diverse sustainable and affordable as

623

00:28:31,000 --> 00:28:27,340

we possibly can

624

00:28:33,490 --> 00:28:31,010

DuckDuckGo lofty ambitions blog in knox

625

00:28:35,140 --> 00:28:33,500

college magazine with the 10% increase

626

00:28:37,930 --> 00:28:35,150

in thrust has that done anything to

627

00:28:40,990 --> 00:28:37,940

change the pad to firing room safety

628

00:28:45,669 --> 00:28:41,000

margin I think that would be more of a

629

00:28:47,260 --> 00:28:45,679

Scott question they're launching with

630

00:28:50,530 --> 00:28:47,270

the added thrust in the capability of a

631

00:28:53,650 --> 00:28:50,540

SLS vehicle does that put the LCC in the

632

00:28:55,450 --> 00:28:53,660

blast zone no I think we're fine

633

00:28:56,680 --> 00:28:55,460

basically we've cited it all the way

634

00:28:58,930 --> 00:28:56,690

back to Saturn is

635

00:29:01,060 --> 00:28:58,940

the blast debris area the BDA we call it

636

00:29:11,589 --> 00:29:01,070

as there's plenty of margin there we're

637

00:29:13,509 --> 00:29:11,599

okay so a question for you I know the

638

00:29:17,769 --> 00:29:13,519

current schedule calls for first flight

639

00:29:20,019 --> 00:29:17,779

2017 second flight I think em2 is 2021

640

00:29:23,759 --> 00:29:20,029

is there concern about the lapse between

641

00:29:26,409 --> 00:29:23,769

unmanned and manned mission in terms of

642

00:29:28,570 --> 00:29:26,419

staleness of staleness of data the

643

00:29:30,009 --> 00:29:28,580

workforce so on and so forth I think

644

00:29:31,479 --> 00:29:30,019

we're going to be doing constant

645

00:29:33,879 --> 00:29:31,489

upgrades like I've said between the

646

00:29:35,560 --> 00:29:33,889

Boosters the engines so the workforce at

647

00:29:38,019 --> 00:29:35,570

KSC is gonna be upgrading their

648

00:29:39,609 --> 00:29:38,029

facilities the design teams up in

649

00:29:42,129 --> 00:29:39,619

Huntsville or working on fly back

650

00:29:46,379 --> 00:29:42,139

boosters and I think there's enough work

651  
00:29:51,159 --> 00:29:49,419  
James DeMuth floor today it sounds like

652  
00:29:52,839 --> 00:29:51,169  
you're gonna have a lot more capability

653  
00:29:56,440 --> 00:29:52,849  
than you need just to launch a crew

654  
00:29:58,479 --> 00:29:56,450  
inside Orion come 2021 and certainly for

655  
00:30:01,320 --> 00:29:58,489  
missions that follow so is there any

656  
00:30:04,210 --> 00:30:01,330  
expectation for you know will you be

657  
00:30:10,089 --> 00:30:04,220  
lifting more than just a Ryan will there

658  
00:30:10,629 --> 00:30:10,099  
be systems hardware you need for to

659  
00:30:12,070 --> 00:30:10,639  
complete

660  
00:30:15,279 --> 00:30:12,080  
you know missions once they're at an

661  
00:30:17,529 --> 00:30:15,289  
orbiter well I think 2021 trying to send

662  
00:30:20,499 --> 00:30:17,539  
a manned crew around the moon will be

663  
00:30:25,210 --> 00:30:20,509

pushing the SLS capability it won't be

664

00:30:26,619 --> 00:30:25,220

excess capacity okay I thought I thought

665

00:30:28,599 --> 00:30:26,629

there might be but but but moving

666

00:30:30,549 --> 00:30:28,609

forward the intention obviously of

667

00:30:35,259 --> 00:30:30,559

evolving to a larger vehicle is that you

668

00:30:37,210 --> 00:30:35,269

would be lifting landers and other

669

00:30:39,310 --> 00:30:37,220

systems in addition to a crew capsule

670

00:30:41,109 --> 00:30:39,320

yeah hopefully we'll be lifting larger

671

00:30:44,499 --> 00:30:41,119

structures that will be made it up in

672

00:30:46,029 --> 00:30:44,509

space to take the mankind into deep

673

00:30:47,440 --> 00:30:46,039

space somewhere wherever the American

674

00:30:49,149 --> 00:30:47,450

public and the president directs us to

675

00:30:54,460 --> 00:30:49,159

this vehicle will give us that

676  
00:30:57,009 --> 00:30:54,470  
capability to do that Robby Adams from a

677  
00:31:00,399 --> 00:30:57,019  
knight Foundation are there components

678  
00:31:02,289 --> 00:31:00,409  
that are waiting to be lifted to the to

679  
00:31:04,060 --> 00:31:02,299  
the International Space Station that

680  
00:31:05,379 --> 00:31:04,070  
that would this would be capable with

681  
00:31:08,019 --> 00:31:05,389  
lifting that you don't maybe have the

682  
00:31:10,040 --> 00:31:08,029  
capacity for with current systems right

683  
00:31:11,480 --> 00:31:10,050  
now we don't have any plans for that

684  
00:31:13,840 --> 00:31:11,490  
you know like we are relying on our

685  
00:31:16,040 --> 00:31:13,850  
commercial partners to haul up the

686  
00:31:18,350 --> 00:31:16,050  
astronauts to the space station and

687  
00:31:23,870 --> 00:31:18,360  
bring it back down and haul up science

688  
00:31:25,370 --> 00:31:23,880

back and forth thank you are there any

689

00:31:28,700 --> 00:31:25,380

other use cases driving the development

690

00:31:30,770 --> 00:31:28,710

of the SLS besides Mars well I think

691

00:31:32,450 --> 00:31:30,780

it's diverse enough work to go anywhere

692

00:31:36,230 --> 00:31:32,460

in deep space if you want to go the moon

693

00:31:38,150 --> 00:31:36,240

Mars Lagrange points anywhere that we

694

00:31:42,500 --> 00:31:38,160

are directed to go this vehicle will

695

00:31:44,720 --> 00:31:42,510

take us I think we have an overall goal

696

00:31:46,900 --> 00:31:44,730

we would all like to go to Mars but we

697

00:32:11,150 --> 00:31:46,910

need a some clear direction for that

698

00:32:12,710 --> 00:32:11,160

thank you thank you very much from the

699

00:32:14,900 --> 00:32:12,720

Commercial Crew program we have Lisa

700

00:32:22,490 --> 00:32:14,910

Colorado she's the associate manager of

701  
00:32:24,620 --> 00:32:22,500  
the CCP kind of unfortunate we have a

702  
00:32:26,180 --> 00:32:24,630  
name like Colorado it sticks out we

703  
00:32:28,640 --> 00:32:26,190  
couldn't have Smith or something you

704  
00:32:31,160 --> 00:32:28,650  
know we all know there's like a couple

705  
00:32:33,920 --> 00:32:31,170  
of thousand civil servants out here and

706  
00:32:35,660 --> 00:32:33,930  
every once in a while both of us line up

707  
00:32:37,520 --> 00:32:35,670  
I did not he neither of us knew we were

708  
00:32:39,260 --> 00:32:37,530  
both speaking in this until we saw the

709  
00:32:41,990 --> 00:32:39,270  
agenda a couple days ago and I'm like

710  
00:32:44,920 --> 00:32:42,000  
are you talking about that so but I'm

711  
00:32:48,080 --> 00:32:44,930  
from the Commercial Crew program we're

712  
00:32:49,730 --> 00:32:48,090  
relatively new here at Kennedy the the

713  
00:32:51,680 --> 00:32:49,740

program was formed a couple of years ago

714

00:32:53,870 --> 00:32:51,690

so we're central here and we're reside

715

00:32:56,960 --> 00:32:53,880

here the program does but we're really

716

00:32:59,270 --> 00:32:56,970

we have about half of our people at JSC

717

00:33:02,600 --> 00:32:59,280

also so it's really across the two

718

00:33:04,880 --> 00:33:02,610

programs our whole mission is about

719

00:33:08,390 --> 00:33:04,890

getting our US astronauts to the space

720

00:33:10,160 --> 00:33:08,400

station so after and you know I know

721

00:33:13,190 --> 00:33:10,170

that's why y'all are here after the

722

00:33:16,280 --> 00:33:13,200

shuttle program was is retired was

723

00:33:19,670 --> 00:33:16,290

retiring they decided that we would have

724

00:33:22,100 --> 00:33:19,680

to rely on the Russian Soyuz to get our

725

00:33:23,930 --> 00:33:22,110

US astronauts back up to the station and

726

00:33:27,050 --> 00:33:23,940

we and we do that now

727

00:33:29,330 --> 00:33:27,060

and we will until we have our capability

728

00:33:32,270 --> 00:33:29,340

ready to go and they're great partners

729

00:33:36,290 --> 00:33:32,280

but you know it's not a good place to be

730

00:33:40,850 --> 00:33:36,300

to have one one provider for that kind

731

00:33:44,350 --> 00:33:40,860

of service and we have we have a lot of

732

00:33:48,020 --> 00:33:44,360

work going on you heard earlier from the

733

00:33:52,010 --> 00:33:48,030

SLS MPCV they have like three programs

734

00:33:54,380 --> 00:33:52,020

kind of running one vehicle we have kind

735

00:33:57,020 --> 00:33:54,390

of one program running three vehicles

736

00:33:58,910 --> 00:33:57,030

right now and I'll explain more we're

737

00:34:01,940 --> 00:33:58,920

kind of give you a background on where

738

00:34:06,500 --> 00:34:01,950

we are and the whole progression so we

739

00:34:08,360 --> 00:34:06,510

started with agreements to have we are

740

00:34:11,090 --> 00:34:08,370

called Commercial Crew development we

741

00:34:13,550 --> 00:34:11,100

had CC dev 1 and CC - those are

742

00:34:15,620 --> 00:34:13,560

Commercial Crew development 1 and 2 we

743

00:34:18,290 --> 00:34:15,630

had agreements with different commercial

744

00:34:21,590 --> 00:34:18,300

industry and the first round was all

745

00:34:23,720 --> 00:34:21,600

about developing concepts and then the

746

00:34:26,419 --> 00:34:23,730

second round was more on subsystem

747

00:34:29,630 --> 00:34:26,429

development and mainly around the

748

00:34:32,300 --> 00:34:29,640

spacecraft itself we're now entering and

749

00:34:35,150 --> 00:34:32,310

we just started we awarded a new round

750

00:34:38,150 --> 00:34:35,160

of agreements to three partners just a

751  
00:34:40,700 --> 00:34:38,160  
couple of months ago in August and those

752  
00:34:43,640 --> 00:34:40,710  
are all the integrated system so this is

753  
00:34:46,190 --> 00:34:43,650  
the first time we have it but it's

754  
00:34:47,330 --> 00:34:46,200  
centered around the launch vehicle they

755  
00:34:49,820 --> 00:34:47,340  
have to have an integrated system it's

756  
00:34:52,340 --> 00:34:49,830  
an launch vehicle the spacecraft the

757  
00:34:53,810 --> 00:34:52,350  
ground systems mission ops the whole the

758  
00:34:56,510 --> 00:34:53,820  
whole thing all the way from start to

759  
00:34:59,270 --> 00:34:56,520  
finish so that is just started and we

760  
00:35:01,270 --> 00:34:59,280  
have three partners that we have that

761  
00:35:03,470 --> 00:35:01,280  
are in work and one is Sierra Nevada

762  
00:35:06,320 --> 00:35:03,480  
Corporation the other one is Boeing and

763  
00:35:08,510 --> 00:35:06,330

then SpaceX so I wanted to and then

764

00:35:11,150 --> 00:35:08,520

pretty soon we're gonna be starting

765

00:35:13,520 --> 00:35:11,160

going into this NASA certification

766

00:35:14,990 --> 00:35:13,530

process so right now it's the design and

767

00:35:16,820 --> 00:35:15,000

development on the systems and soon

768

00:35:19,250 --> 00:35:16,830

we're going to enter into the NASA

769

00:35:21,140 --> 00:35:19,260

certification of those systems so again

770

00:35:22,910 --> 00:35:21,150

ultimately what we want to do is buy a

771

00:35:25,280 --> 00:35:22,920

ride so eventually that's what we're

772

00:35:27,500 --> 00:35:25,290

gonna get so before I go any further I

773

00:35:29,570 --> 00:35:27,510

did want to show you a video of our

774

00:35:32,270 --> 00:35:29,580

three partners I'm not really sure what

775

00:35:33,500 --> 00:35:32,280

this video shows so I might have to talk

776

00:36:09,490 --> 00:35:33,510

through it I don't know that I've seen

777

00:36:16,270 --> 00:36:11,880

looks a little bit like a mini shuttle

778

00:36:18,480 --> 00:36:16,280

much smaller and what they're doing is

779

00:36:21,880 --> 00:36:18,490

testing their aerodynamics of their

780

00:36:27,870 --> 00:36:21,890

design learned a lot making some changes

781

00:36:35,220 --> 00:36:30,600

and this is SpaceX's vehicle it's a

782

00:36:38,370 --> 00:36:35,230

falcon 9 and the dragon placing this in

783

00:36:40,710 --> 00:36:38,380

the news lately it's not quite the same

784

00:36:42,870 --> 00:36:40,720

ours as the crew crew version of that

785

00:36:45,780 --> 00:36:42,880

what you've seen in the papers and read

786

00:36:51,050 --> 00:36:45,790

about lately is their big success on the

787

00:36:57,090 --> 00:36:54,900

and this is Boeing's cst-100 they're

788

00:37:01,050 --> 00:36:57,100

doing a drop test and you'll see they're

789

00:37:06,510 --> 00:37:01,060

going to test out their pairs or their

790

00:37:09,810 --> 00:37:08,460

and this is our engine testing I don't

791

00:37:13,560 --> 00:37:09,820

know I guess we don't have them the

792

00:37:15,120 --> 00:37:13,570

landing sorry about that I said I didn't

793

00:37:19,370 --> 00:37:15,130

get to see the video around if I've seen

794

00:37:42,390 --> 00:37:23,280

yeah there's leaning so that's the

795

00:37:42,400 --> 00:37:47,150

Thanks

796

00:37:55,610 --> 00:37:51,250

I know you saw in the earlier video that

797

00:37:57,350 --> 00:37:55,620

heavy SOS and MPCV were about on the

798

00:38:00,140 --> 00:37:57,360

same schedule so maybe it's a little bit

799

00:38:04,120 --> 00:38:00,150

of a race for internally our schedule

800

00:38:07,730 --> 00:38:04,130

has us have being ready around 2017 also

801  
00:38:10,100 --> 00:38:07,740  
depending on the budget we get obviously

802  
00:38:13,310 --> 00:38:10,110  
but it's right around the same time that

803  
00:38:14,780 --> 00:38:13,320  
sls and PCV they're planning the same

804  
00:38:18,050 --> 00:38:14,790  
time so we'll see who gets there first

805  
00:38:20,870 --> 00:38:18,060  
we think it's going to be us so where we

806  
00:38:23,990 --> 00:38:20,880  
are right now with the the integrated

807  
00:38:26,900 --> 00:38:24,000  
capability it's called ccicap recently

808  
00:38:28,310 --> 00:38:26,910  
just to tie it in to what's going on at

809  
00:38:31,790 --> 00:38:28,320  
the Kennedy because I think that's the

810  
00:38:33,950 --> 00:38:31,800  
theme of transforming Kennedy here our

811  
00:38:37,550 --> 00:38:33,960  
Boeing partners just finish their

812  
00:38:39,920 --> 00:38:37,560  
production development review and it was

813  
00:38:41,870 --> 00:38:39,930

all about laying out the production

814

00:38:44,180 --> 00:38:41,880

capabilities that they're gonna have

815

00:38:46,430 --> 00:38:44,190

here at Kennedy Space Center converting

816

00:38:49,670 --> 00:38:46,440

the what was that were processing

817

00:38:51,950 --> 00:38:49,680

facility Bay 3 to their facility which i

818

00:38:53,390 --> 00:38:51,960

think is called CC 3 PF which is

819

00:38:56,270 --> 00:38:53,400

Commercial Crew and cargo processing

820

00:38:58,010 --> 00:38:56,280

facility I believe and it was all about

821

00:39:00,790 --> 00:38:58,020

the production they're going to do

822

00:39:03,500 --> 00:39:00,800

they're transforming and modifying the

823

00:39:05,510 --> 00:39:03,510

facility right now tearing out some of

824

00:39:07,310 --> 00:39:05,520

the old platforms and things they don't

825

00:39:10,880 --> 00:39:07,320

need clearing it out building all their

826

00:39:13,220 --> 00:39:10,890

news so that was just done this week we

827

00:39:16,970 --> 00:39:13,230

are off and running I can't tell you I

828

00:39:20,120 --> 00:39:16,980

mean as soon as those I kept awards were

829

00:39:23,000 --> 00:39:20,130

made our team we have just been non-stop

830

00:39:25,730 --> 00:39:23,010

there's there's a lot going on for three

831

00:39:28,790 --> 00:39:25,740

partners so we had the production design

832

00:39:32,120 --> 00:39:28,800

review all of them all of our partners

833

00:39:34,430 --> 00:39:32,130

right away had what we call sort of a

834

00:39:35,900 --> 00:39:34,440

baseline review of their systems again

835

00:39:38,690 --> 00:39:35,910

since this is the first time we were

836

00:39:41,180 --> 00:39:38,700

looking at an integrated system this was

837

00:39:42,680 --> 00:39:41,190

their first round they had some sort

838

00:39:44,720 --> 00:39:42,690

called call them different names but

839

00:39:46,460 --> 00:39:44,730

basically they were all about putting

840

00:39:50,690 --> 00:39:46,470

together their plan for their integrated

841

00:39:53,510 --> 00:39:50,700

systems and they had safety reviews are

842

00:39:55,940 --> 00:39:53,520

coming up the next next round I think

843

00:39:57,920 --> 00:39:55,950

and most of them have some sort of

844

00:40:00,170 --> 00:39:57,930

safety review called but you know called

845

00:40:00,420 --> 00:40:00,180

something and then different names and

846

00:40:03,330 --> 00:40:00,430

then

847

00:40:05,910 --> 00:40:03,340

have some of the ground software and the

848

00:40:08,340 --> 00:40:05,920

groundwork is coming up in the asset and

849

00:40:10,710 --> 00:40:08,350

lunch and recovery work so that's kind

850

00:40:12,330 --> 00:40:10,720

of where we are and the program like I

851

00:40:15,660 --> 00:40:12,340

said we've come a long way

852

00:40:17,340 --> 00:40:15,670

a lot of that video hopefully you see

853

00:40:20,220 --> 00:40:17,350

that in the news we're doing trying to

854

00:40:22,620 --> 00:40:20,230

do a little bit more with getting word

855

00:40:24,900 --> 00:40:22,630

out in public affairs I know the

856

00:40:27,960 --> 00:40:24,910

partners themselves release a lot of

857

00:40:31,380 --> 00:40:27,970

press releases you know the videos are

858

00:40:33,900 --> 00:40:31,390

out we have a really good website that

859

00:40:36,480 --> 00:40:33,910

you can connect to and you can see those

860

00:40:38,310 --> 00:40:36,490

videos and a lot of the work that's been

861

00:40:39,600 --> 00:40:38,320

going on and learn about the test

862

00:40:41,070 --> 00:40:39,610

there's really a lot to talk about

863

00:40:43,800 --> 00:40:41,080

I don't think I could do that in ten

864

00:40:48,660 --> 00:40:43,810

minutes so just I guess I open up to

865

00:40:52,800 --> 00:40:48,670

questions if y'all have any seriously

866

00:40:55,830 --> 00:40:52,810

don't be shy guys hi my name is Ron

867

00:40:57,810 --> 00:40:55,840

sparks question you mentioned NASA

868

00:41:00,300 --> 00:40:57,820

certification for your commercial

869

00:41:02,400 --> 00:41:00,310

partners is that certification in order

870

00:41:04,430 --> 00:41:02,410

to lift our astronauts into orbit or to

871

00:41:07,740 --> 00:41:04,440

use the facilities or how does that work

872

00:41:11,010 --> 00:41:07,750

definitely for our astronauts the safety

873

00:41:12,570 --> 00:41:11,020

of our astronauts so once we get past or

874

00:41:15,300 --> 00:41:12,580

we're about to we actually have a

875

00:41:18,720 --> 00:41:15,310

certification products contract that's

876

00:41:22,530 --> 00:41:18,730

being reviewed right now the proposals

877

00:41:25,020 --> 00:41:22,540

are under review our our overall process

878

00:41:27,390 --> 00:41:25,030

for certifying the whole system is gonna

879

00:41:29,430 --> 00:41:27,400

be done in a two-phase approach so our

880

00:41:31,500 --> 00:41:29,440

first phase is what's going on right now

881

00:41:33,990 --> 00:41:31,510

and that's what's being reviewed will be

882

00:41:36,330 --> 00:41:34,000

followed by followed with a second

883

00:41:39,000 --> 00:41:36,340

longer term phase and it's all about

884

00:41:41,280 --> 00:41:39,010

certifying that their systems meet our

885

00:41:43,590 --> 00:41:41,290

requirements our safety requirements and

886

00:41:46,200 --> 00:41:43,600

our performance requirements so that's

887

00:41:48,150 --> 00:41:46,210

where we are as far as we're actually

888

00:41:50,910 --> 00:41:48,160

very excited because it shouldn't be

889

00:41:53,280 --> 00:41:50,920

that long or saying that that first

890

00:41:56,730 --> 00:41:53,290

contract is to be ready a tow award in

891

00:41:57,740 --> 00:41:56,740

the February timeframe so not too much

892

00:42:00,480 --> 00:41:57,750

longer

893

00:42:04,910 --> 00:42:00,490

Lisa how many how many astronauts will

894

00:42:09,060 --> 00:42:04,920

the capsule wall requirement is for for

895

00:42:11,910 --> 00:42:09,070

most most of them have planned for more

896

00:42:13,740 --> 00:42:11,920

than for up to seven most enough seven

897

00:42:14,160 --> 00:42:13,750

and they're looking at you know there's

898

00:42:16,680 --> 00:42:14,170

a lot

899

00:42:18,660 --> 00:42:16,690

trades going on right now not sure all

900

00:42:20,370 --> 00:42:18,670

of them will stay at 7:00 but I mean

901

00:42:22,890 --> 00:42:20,380

it's a good point our requirement is

902

00:42:25,019 --> 00:42:22,900

four but the whole commercialization

903

00:42:27,059 --> 00:42:25,029

concept is that they could use the

904

00:42:28,849 --> 00:42:27,069

vehicle for other non-national a

905

00:42:32,220 --> 00:42:28,859

submission so they could have their own

906

00:42:34,980 --> 00:42:32,230

use you know to go for space tourism or

907

00:42:36,890 --> 00:42:34,990

any other any other use and different

908

00:42:39,480 --> 00:42:36,900

each one of them has kind of a different

909

00:42:43,079 --> 00:42:39,490

business model I guess is saying that

910

00:42:45,180 --> 00:42:43,089

but our requirements are for wooden

911

00:42:48,420 --> 00:42:45,190

Boeing's capsule capsule be capable of

912

00:42:51,089 --> 00:42:48,430

water landing as well I don't think so

913

00:42:54,240 --> 00:42:51,099

not anymore I know again they were doing

914

00:42:57,809 --> 00:42:54,250

trees but it's now the baseline is a

915

00:43:00,150 --> 00:42:57,819

land landing and that's what you saw on

916

00:43:03,259 --> 00:43:00,160

there they're doing testing they they

917

00:43:07,259 --> 00:43:03,269

did probably a week's worth of tests and

918

00:43:09,029 --> 00:43:07,269

again learned a lot they made some

919

00:43:11,759 --> 00:43:09,039

adjustments justments in there at

920

00:43:13,130 --> 00:43:11,769

airbags and have a center bag that

921

00:43:17,099 --> 00:43:13,140

they're going to be using to keep it

922

00:43:23,339 --> 00:43:17,109

upright and more stable so I think it's

923

00:43:26,640 --> 00:43:23,349

only land landing for now are those

924

00:43:27,630 --> 00:43:26,650

safety requirements meeting those of the

925

00:43:31,589 --> 00:43:27,640

space shuttle or are they going to

926

00:43:33,930 --> 00:43:31,599

exceed that well they're they actually

927

00:43:36,990 --> 00:43:33,940

exceed them I guess it depends that's

928

00:43:40,410 --> 00:43:37,000

always a big debate right they spent a

929

00:43:43,109 --> 00:43:40,420

lot of time in the program for probably

930

00:43:44,970 --> 00:43:43,119

a year year and a half understanding and

931

00:43:46,769 --> 00:43:44,980

leveraging off of the old shuttle

932

00:43:49,650 --> 00:43:46,779

requirements and what's changed and

933

00:43:52,859 --> 00:43:49,660

what's improved you know the whole

934

00:43:55,200 --> 00:43:52,869

technology has changed so technically I

935

00:43:57,499 --> 00:43:55,210

guess some people would would view them

936

00:44:00,690 --> 00:43:57,509

and maybe said they're different and and

937

00:44:04,579 --> 00:44:00,700

our view is that they are definitely

938

00:44:07,980 --> 00:44:04,589

safer they're different but safer

939

00:44:09,690 --> 00:44:07,990

Jonathan yeah I was wondering is there

940

00:44:13,079 --> 00:44:09,700

any future plans for commercialization

941

00:44:14,880 --> 00:44:13,089

to pass Isis or is it just that's all

942

00:44:19,440 --> 00:44:14,890

that's all that's on the board right now

943

00:44:21,930 --> 00:44:19,450

yeah for our program it's only for ISS

944

00:44:23,490 --> 00:44:21,940

or low low Earth orbit so there are some

945

00:44:26,670 --> 00:44:23,500

concepts like I said there's space

946

00:44:27,840 --> 00:44:26,680

tourism so there someday may be a space

947

00:44:30,120 --> 00:44:27,850

hotel you

948

00:44:33,600 --> 00:44:30,130

a place to go a resort to go visit and

949

00:44:35,850 --> 00:44:33,610

fly there for you know for fun but our

950

00:44:36,900 --> 00:44:35,860

vehicle in the performance is only for

951  
00:44:40,860 --> 00:44:36,910  
low-earth orbit

952  
00:44:43,200 --> 00:44:40,870  
so there could be other uses our mission

953  
00:44:46,770 --> 00:44:43,210  
is really for our NASA astronauts but

954  
00:44:48,500 --> 00:44:46,780  
like I said the the more market there is

955  
00:44:51,480 --> 00:44:48,510  
a better market the better it is for our

956  
00:44:54,120 --> 00:44:51,490  
customers our partner so they are all

957  
00:44:57,770 --> 00:44:54,130  
pursuing different markets and it's hard

958  
00:45:01,980 --> 00:44:57,780  
to know you know at some point once you

959  
00:45:04,200 --> 00:45:01,990  
develop the capability it we hope and

960  
00:45:06,240 --> 00:45:04,210  
it's expected to stimulate more market

961  
00:45:11,090 --> 00:45:06,250  
and more business and more ideas so

962  
00:45:13,560 --> 00:45:11,100  
there's a good chance that it will I

963  
00:45:16,160 --> 00:45:13,570

Lisa question for you about the man

964

00:45:19,770 --> 00:45:16,170

rating of Atlas 5 are you managing that

965

00:45:21,300 --> 00:45:19,780

through both Boeing and the SNC program

966

00:45:23,040 --> 00:45:21,310

are you doing that independently I seem

967

00:45:25,890 --> 00:45:23,050

to remember something about there was an

968

00:45:27,780 --> 00:45:25,900

unfunded I think a Space Act or

969

00:45:28,830 --> 00:45:27,790

something that went on without with ula

970

00:45:30,750 --> 00:45:28,840

and analyst father could you talk about

971

00:45:34,170 --> 00:45:30,760

that yeah so you're talking about under

972

00:45:35,940 --> 00:45:34,180

CC dev 2 we had we had some funded as a

973

00:45:38,480 --> 00:45:35,950

Space Act agreements and we had some

974

00:45:43,350 --> 00:45:38,490

unfunded and we did have an unfunded

975

00:45:46,430 --> 00:45:43,360

agreement with ula and so in ATK I got

976  
00:45:48,810 --> 00:45:46,440  
well we we looked at it and we had some

977  
00:45:51,690 --> 00:45:48,820  
civil servants on it but it was mainly

978  
00:45:54,470 --> 00:45:51,700  
about understanding and learning about

979  
00:45:57,360 --> 00:45:54,480  
what it would take two men right and

980  
00:46:00,510 --> 00:45:57,370  
doing technical interchange meetings

981  
00:46:04,830 --> 00:46:00,520  
having discussions it was nothing

982  
00:46:06,720 --> 00:46:04,840  
binding we didn't we have not really

983  
00:46:09,030 --> 00:46:06,730  
ventured down that other than to give

984  
00:46:11,790 --> 00:46:09,040  
them some of our benefit of our

985  
00:46:13,230 --> 00:46:11,800  
expertise and what we expect and for

986  
00:46:16,920 --> 00:46:13,240  
them to learn and tell us what their

987  
00:46:19,800 --> 00:46:16,930  
plans are but our art like I said our

988  
00:46:22,470 --> 00:46:19,810

system will be certified to the safety

989

00:46:26,670 --> 00:46:22,480

requirements and we will work through

990

00:46:29,820 --> 00:46:26,680

our Boeing and you know our primes so we

991

00:46:31,350 --> 00:46:29,830

will directly be you know interfacing

992

00:46:33,060 --> 00:46:31,360

with them and doing that but we have to

993

00:46:34,440 --> 00:46:33,070

make sure the whole entire system

994

00:46:36,390 --> 00:46:34,450

including the launch vehicle has the

995

00:46:39,000 --> 00:46:36,400

right

996

00:46:40,890 --> 00:46:39,010

as you look at Atlas 5 as a component of

997

00:46:44,130 --> 00:46:40,900

both complete systems independently you

998

00:46:47,130 --> 00:46:44,140

won't look at it as you won't look at it

999

00:46:48,930 --> 00:46:47,140

as a as a separate component no it will

1000

00:46:50,760 --> 00:46:48,940

be part of the whole system you know

1001

00:46:52,350 --> 00:46:50,770

what we do have teams I mean we have our

1002

00:46:54,360 --> 00:46:52,360

organization is set up so that we have a

1003

00:46:57,420 --> 00:46:54,370

launch vehicle systems office and a

1004

00:47:00,060 --> 00:46:57,430

spacecraft and a ground so in effect we

1005

00:47:02,760 --> 00:47:00,070

will have some different groups but in

1006

00:47:06,900 --> 00:47:02,770

the end we have to certify the whole

1007

00:47:09,000 --> 00:47:06,910

system if there is a change of

1008

00:47:11,130 --> 00:47:09,010

administration next week how do you see

1009

00:47:14,310 --> 00:47:11,140

this affecting or not affecting business

1010

00:47:16,350 --> 00:47:14,320

or slowing it down or what do you see

1011

00:47:19,650 --> 00:47:16,360

yeah that's the million-dollar question

1012

00:47:24,210 --> 00:47:19,660

right we've been there before and things

1013

00:47:26,850 --> 00:47:24,220

can change it's hard to say you know it

1014

00:47:28,890 --> 00:47:26,860

really is hard to say I think there's a

1015

00:47:31,230 --> 00:47:28,900

lot of support for the commercial

1016

00:47:35,430 --> 00:47:31,240

marketing a commercial space market in

1017

00:47:38,300 --> 00:47:35,440

general we have some commitments already

1018

00:47:40,740 --> 00:47:38,310

made so I don't think those will be

1019

00:47:43,830 --> 00:47:40,750

disturbed the for the work that's going

1020

00:47:48,330 --> 00:47:43,840

on right now will remain to see don't

1021

00:47:50,580 --> 00:47:48,340

have to remain optimistic and just wait

1022

00:47:52,920 --> 00:47:50,590

and see what happens but either way

1023

00:47:53,910 --> 00:47:52,930

we'll adjust you know we always will

1024

00:47:56,370 --> 00:47:53,920

just have to do whatever the

1025

00:47:58,770 --> 00:47:56,380

administration has decides as our future

1026  
00:48:01,860 --> 00:47:58,780  
will will adjust and make plans so I'm

1027  
00:48:03,410 --> 00:48:01,870  
hopeful that we'll stay on track it's a

1028  
00:48:07,020 --> 00:48:03,420  
good question though

1029  
00:48:09,240 --> 00:48:07,030  
hi is there any way that NASA has grown

1030  
00:48:12,740 --> 00:48:09,250  
the program through their partners and

1031  
00:48:17,330 --> 00:48:12,750  
ideas or vice versa or any collaboration

1032  
00:48:21,180 --> 00:48:17,340  
that is like the whole underlying I

1033  
00:48:23,490 --> 00:48:21,190  
guess foundation of our program and we

1034  
00:48:26,160 --> 00:48:23,500  
notice we call them partnerships which

1035  
00:48:29,280 --> 00:48:26,170  
is true which is it's intended to be a

1036  
00:48:32,100 --> 00:48:29,290  
partnership we have done so many things

1037  
00:48:35,220 --> 00:48:32,110  
that are innovative and different from

1038  
00:48:39,450 --> 00:48:35,230

maybe some of the historical programs

1039

00:48:40,470 --> 00:48:39,460

manned space programs we have we have

1040

00:48:42,900 --> 00:48:40,480

tank teams

1041

00:48:45,300 --> 00:48:42,910

pit teams that work with our partners so

1042

00:48:47,820 --> 00:48:45,310

we have a pit team partner integration

1043

00:48:48,859 --> 00:48:47,830

team that that works with each of the

1044

00:48:52,789 --> 00:48:48,869

partners

1045

00:48:56,329 --> 00:48:52,799

and we are in constant contact with them

1046

00:49:00,079 --> 00:48:56,339

we meet in our teams meet daily to

1047

00:49:02,299 --> 00:49:00,089

understand where their risks are and

1048

00:49:04,640 --> 00:49:02,309

where they are in the process and how we

1049

00:49:07,339 --> 00:49:04,650

can help in the expertise we have maybe

1050

00:49:08,620 --> 00:49:07,349

in-house we have done a lot of things

1051  
00:49:10,759 --> 00:49:08,630  
even back when we were writing

1052  
00:49:14,900 --> 00:49:10,769  
requirements or programmatic

1053  
00:49:19,719 --> 00:49:14,910  
requirements we had several forums with

1054  
00:49:22,279 --> 00:49:19,729  
industry there to say these are proposed

1055  
00:49:24,140 --> 00:49:22,289  
requirements as as we had them but back

1056  
00:49:27,819 --> 00:49:24,150  
at the back before they were baselined

1057  
00:49:31,459 --> 00:49:27,829  
or approved and asked for feedback and

1058  
00:49:36,279 --> 00:49:31,469  
we got a lot of feedback and so you know

1059  
00:49:40,849 --> 00:49:36,289  
and so we have really tried to include

1060  
00:49:43,519 --> 00:49:40,859  
industry in a lot of our progress and

1061  
00:49:44,930 --> 00:49:43,529  
decision-making along the way and so I

1062  
00:49:49,789 --> 00:49:44,940  
would definitely say it's more of a

1063  
00:49:51,019 --> 00:49:49,799

partnership and in the innovation I

1064

00:49:53,719 --> 00:49:51,029

don't know if you notice and you pick it

1065

00:49:55,880 --> 00:49:53,729

up on the video how different the three

1066

00:49:58,099 --> 00:49:55,890

the three different commercial

1067

00:49:59,329 --> 00:49:58,109

transportation systems are just even

1068

00:50:02,569 --> 00:49:59,339

looking at them you know they're very

1069

00:50:04,309 --> 00:50:02,579

it's a lot of it is kind of amazing when

1070

00:50:06,799 --> 00:50:04,319

you put out once you know kind of the

1071

00:50:08,930 --> 00:50:06,809

same requirements to all the industry

1072

00:50:11,269 --> 00:50:08,940

and they come up with three very

1073

00:50:15,049 --> 00:50:11,279

different looking and functioning and

1074

00:50:17,569 --> 00:50:15,059

you know different um philosophies

1075

00:50:20,739 --> 00:50:17,579

behind their their their systems so it's

1076  
00:50:23,269 --> 00:50:20,749  
been good challenges both sides I think

1077  
00:50:25,219 --> 00:50:23,279  
to be last question of all times um is

1078  
00:50:26,509 --> 00:50:25,229  
there any concern about the Commercial

1079  
00:50:28,549 --> 00:50:26,519  
Crew program and the press is getting

1080  
00:50:31,809 --> 00:50:28,559  
especially with SpaceX over shattering

1081  
00:50:34,160 --> 00:50:31,819  
what NASA is doing internally with SLS I

1082  
00:50:38,599 --> 00:50:34,170  
know your ass and probably the wrong

1083  
00:50:41,989 --> 00:50:38,609  
person I think I mean me personally I

1084  
00:50:44,569 --> 00:50:41,999  
think any success is good for the space

1085  
00:50:46,130 --> 00:50:44,579  
industry in general so we root for them

1086  
00:50:48,859 --> 00:50:46,140  
just like I'm you know we work with our

1087  
00:50:51,769 --> 00:50:48,869  
counterparts for the station and

1088  
00:50:53,569 --> 00:50:51,779

anything that that helps and anything

1089

00:50:56,779 --> 00:50:53,579

that brings up the whole level of the

1090

00:50:59,690 --> 00:50:56,789

the community the space community the

1091

00:51:01,609 --> 00:50:59,700

commercial industry is really I mean we

1092

00:51:02,779 --> 00:51:01,619

see it good for all so I don't know that

1093

00:51:04,999 --> 00:51:02,789

we would ever

1094

00:51:07,909 --> 00:51:05,009

think that it's you know a competition

1095

00:51:09,890 --> 00:51:07,919

in that sense now you know some of the

1096

00:51:12,650 --> 00:51:09,900

presses in here makes it come across a

1097

00:51:14,449 --> 00:51:12,660

little bit that way in my view but

1098

00:51:16,849 --> 00:51:14,459

that's not you know that's not kind of

1099

00:51:20,449 --> 00:51:16,859

our program look we would love to see

1100

00:51:23,329 --> 00:51:20,459

more more success as many that we can we

1101

00:51:25,159 --> 00:51:23,339

can have is actually a better for the

1102

00:51:29,749 --> 00:51:25,169

whole program and better for the agency

1103

00:51:37,359 --> 00:51:29,759

so and the in the country thank thank

1104

00:51:43,400 --> 00:51:40,909

up next today is Bruce Reid he is the

1105

00:51:44,900 --> 00:51:43,410

Kennedy Space Center mission manager for

1106

00:51:46,640 --> 00:51:44,910

the Landsat data continuity mission

1107

00:51:47,809 --> 00:51:46,650

which I don't know if you all have been

1108

00:51:49,370 --> 00:51:47,819

following along but we announced that

1109

00:51:51,499 --> 00:51:49,380

we're gonna be doing a NASA social at

1110

00:51:53,989 --> 00:51:51,509

the Idcm launch out at Vandenberg Air

1111

00:51:55,880 --> 00:51:53,999

Force Base coming up in February so if

1112

00:51:59,390 --> 00:51:55,890

you haven't seen that yet please go to

1113

00:52:01,039 --> 00:51:59,400

dub dub dub nasa.gov slash social and go

1114

00:52:02,449 --> 00:52:01,049

ahead and look around for registration

1115

00:52:03,529 --> 00:52:02,459

in December so here to tell you a little

1116

00:52:09,829 --> 00:52:03,539

bit about what they're doing to prepare

1117

00:52:12,679 --> 00:52:09,839

for launch here is Bruce thank you Jason

1118

00:52:16,969 --> 00:52:12,689

and thanks for opening up social to

1119

00:52:18,289 --> 00:52:16,979

people not named Colorado I just want to

1120

00:52:20,449 --> 00:52:18,299

start by telling you a little bit about

1121

00:52:21,649 --> 00:52:20,459

what the launch services program does so

1122

00:52:24,380 --> 00:52:21,659

we've talked a lot about the banned

1123

00:52:27,649 --> 00:52:24,390

programs here today the launch services

1124

00:52:31,370 --> 00:52:27,659

program is the middleman between the

1125

00:52:34,069 --> 00:52:31,380

spacecraft and the launch vehicle so our

1126  
00:52:37,009 --> 00:52:34,079  
job is to procure the launch service and

1127  
00:52:39,199 --> 00:52:37,019  
to select the appropriate launch vehicle

1128  
00:52:42,049 --> 00:52:39,209  
and of course this is based on the size

1129  
00:52:44,859 --> 00:52:42,059  
of the spacecraft its destination in

1130  
00:52:48,679 --> 00:52:44,869  
space and of course how much it weighs

1131  
00:52:50,989 --> 00:52:48,689  
so for our spacecraft customers we

1132  
00:52:52,640 --> 00:52:50,999  
provide a lot of technical guidance and

1133  
00:52:55,640 --> 00:52:52,650  
this is over a period of three to five

1134  
00:52:58,039 --> 00:52:55,650  
years so they'll need help with what are

1135  
00:53:00,409 --> 00:52:58,049  
the interface requirements how do I fit

1136  
00:53:05,029 --> 00:53:00,419  
mechanically and electrical on this

1137  
00:53:07,789 --> 00:53:05,039  
launch vehicle payload adaptor and I'm

1138  
00:53:10,429 --> 00:53:07,799

sure most of you are aware of the recent

1139

00:53:14,569 --> 00:53:10,439

missions that we have had and overseeing

1140

00:53:16,130 --> 00:53:14,579

we had rbsp radio about storm probes in

1141

00:53:17,960 --> 00:53:16,140

August of this year

1142

00:53:21,500 --> 00:53:17,970

also the NuStar mission was launched

1143

00:53:25,550 --> 00:53:21,510

from Kwajalein that was off of the the

1144

00:53:27,320 --> 00:53:25,560

air launched pegasus rocket and i was

1145

00:53:28,910 --> 00:53:27,330

the mission manager on grail last year

1146

00:53:35,870 --> 00:53:28,920

that was the Gravity Recovery and

1147

00:53:37,040 --> 00:53:35,880

interior laboratory and of course the

1148

00:53:39,410 --> 00:53:37,050

one that you saw in the video earlier

1149

00:53:44,170 --> 00:53:39,420

the Mars Science Lab launched in

1150

00:53:47,030 --> 00:53:44,180

November of last year so my job is to

1151  
00:53:49,250 --> 00:53:47,040  
I'm the primary point of contact for the

1152  
00:53:52,310 --> 00:53:49,260  
spacecraft customer which means I'm the

1153  
00:53:54,320 --> 00:53:52,320  
complaint department actually but I have

1154  
00:53:56,390 --> 00:53:54,330  
what we call mission integration team so

1155  
00:53:59,360 --> 00:53:56,400  
it's a team of senior level engineers

1156  
00:54:01,040 --> 00:53:59,370  
and business people and we guide the

1157  
00:54:03,410 --> 00:54:01,050  
customer through this through this

1158  
00:54:05,240 --> 00:54:03,420  
process so our ultimate goal in the

1159  
00:54:06,310 --> 00:54:05,250  
launch services program which is based

1160  
00:54:09,770 --> 00:54:06,320  
here at KSC

1161  
00:54:12,160 --> 00:54:09,780  
is to maximize mission success that is

1162  
00:54:15,920 --> 00:54:12,170  
our goal the program has been here since

1163  
00:54:17,210 --> 00:54:15,930

1998 so what I really wanted to talk to

1164

00:54:20,060 --> 00:54:17,220

you about today was the Landsat data

1165

00:54:22,760 --> 00:54:20,070

continuity mission it's launching on

1166

00:54:25,460 --> 00:54:22,770

February 11th from Vandenberg Air Force

1167

00:54:30,110 --> 00:54:25,470

Base and we're gonna show a short video

1168

00:54:40,790 --> 00:54:30,120

here about what Idcm means to the

1169

00:54:42,500 --> 00:54:40,800

everyday person in 1972 was satellite

1170

00:54:45,590 --> 00:54:42,510

was launched which will help to manage

1171

00:54:49,940 --> 00:54:45,600

world agriculture Landsat the earth

1172

00:54:51,850 --> 00:54:49,950

resources and today over seven billion

1173

00:54:54,530 --> 00:54:51,860

people and their use of technology

1174

00:54:59,280 --> 00:54:54,540

create drastic changes to the land

1175

00:55:05,349 --> 00:55:02,950

in four decades Landsat satellites have

1176

00:55:07,540 --> 00:55:05,359

revolutionized remote sensing by

1177

00:55:14,670 --> 00:55:07,550

collecting the longest historical

1178

00:55:20,500 --> 00:55:17,740

launching Idcm and continuing the

1179

00:55:22,720 --> 00:55:20,510

Landsat mission is critical for the

1180

00:55:32,980 --> 00:55:22,730

large number of government and private

1181

00:55:35,859 --> 00:55:32,990

data users worldwide for the Robert

1182

00:55:38,820 --> 00:55:35,869

Mondavi Winery of Napa Valley California

1183

00:55:43,599 --> 00:55:38,830

Landsat plays a major role in monitoring

1184

00:55:46,090 --> 00:55:43,609

400 acres of land the raw satellite data

1185

00:55:49,300 --> 00:55:46,100

gets processed externally as a weekly

1186

00:55:52,090 --> 00:55:49,310

report the Landsat imagery and data in

1187

00:55:55,359 --> 00:55:52,100

the report show color-coded comparisons

1188

00:55:57,520 --> 00:55:55,369

of water usage leaf growth stress levels

1189

00:56:00,190 --> 00:55:57,530

and other measurements from the current

1190

00:56:02,349 --> 00:56:00,200

and past years as well as detailed

1191

00:56:04,530 --> 00:56:02,359

graphs with the condition of each

1192

00:56:07,870 --> 00:56:04,540

vineyard glunk

1193

00:56:11,290 --> 00:56:07,880

based on this information managers can

1194

00:56:13,080 --> 00:56:11,300

plan care for the vines now and also in

1195

00:56:15,849 --> 00:56:13,090

the years ahead

1196

00:56:18,640 --> 00:56:15,859

the Landsat image allows us to

1197

00:56:20,980 --> 00:56:18,650

understand and quantify how many leaves

1198

00:56:23,320 --> 00:56:20,990

there are in a vineyard and once we know

1199

00:56:25,590 --> 00:56:23,330

that then the people we're working with

1200

00:56:29,020 --> 00:56:25,600

they can make calculations of how much

1201  
00:56:31,090 --> 00:56:29,030  
water that is we can compare to other

1202  
00:56:32,859 --> 00:56:31,100  
vineyards are we using too much or too

1203  
00:56:33,550 --> 00:56:32,869  
little are we applying it at the right

1204  
00:56:35,950 --> 00:56:33,560  
time

1205  
00:56:39,430 --> 00:56:35,960  
one of the major advantages for the

1206  
00:56:41,380 --> 00:56:39,440  
winery is the use of continuous data to

1207  
00:56:44,099 --> 00:56:41,390  
help make long-term decisions in

1208  
00:56:50,170 --> 00:56:47,769  
among many other uses Landsat data is

1209  
00:56:53,739 --> 00:56:50,180  
applied in managing millions of acres of

1210  
00:56:56,739 --> 00:56:53,749  
timberland using a specially designed

1211  
00:56:59,229 --> 00:56:56,749  
tool workers at American Forests

1212  
00:57:02,430 --> 00:56:59,239  
management are able to analyze satellite

1213  
00:57:05,680 --> 00:57:02,440

data and estimate the leaf area index

1214

00:57:10,059 --> 00:57:05,690

this index shows the concentration of

1215

00:57:11,890 --> 00:57:10,069

needles on pine trees once we process

1216

00:57:14,829 --> 00:57:11,900

the role product we were able to create

1217

00:57:17,950 --> 00:57:14,839

maps for clients which allow them to

1218

00:57:21,249 --> 00:57:17,960

analyze the data look at sands that have

1219

00:57:23,289 --> 00:57:21,259

high or low leaf area index based off

1220

00:57:25,299 --> 00:57:23,299

that number they're able to make

1221

00:57:28,180 --> 00:57:25,309

management decisions whether it's

1222

00:57:30,880 --> 00:57:28,190

beneficial to fertilize or possibly do

1223

00:57:34,829 --> 00:57:30,890

some Hardware control on a stand to make

1224

00:57:37,779 --> 00:57:34,839

it grow stronger faster healthier

1225

00:57:40,569 --> 00:57:37,789

Landsat provides a quicker solution to

1226

00:57:43,269 --> 00:57:40,579

pinpointing problematic areas so they

1227

00:57:46,029 --> 00:57:43,279

can be further analyzed on the ground in

1228

00:57:49,959 --> 00:57:46,039

contrast collecting data on the ground

1229

00:57:52,150 --> 00:57:49,969

or by airplane involves more manpower it

1230

00:57:54,670 --> 00:57:52,160

is slower and comes at a much higher

1231

00:57:57,519 --> 00:57:54,680

cost which makes this series of

1232

00:58:09,900 --> 00:57:57,529

satellites irreplaceable for many years

1233

00:58:15,970 --> 00:58:12,970

okay I've got some slides to augment

1234

00:58:17,770 --> 00:58:15,980

that video you did notice on there that

1235

00:58:21,060 --> 00:58:17,780

it is wine country if he needed another

1236

00:58:28,020 --> 00:58:21,070

reason to go to the NASA social watch

1237

00:58:35,800 --> 00:58:32,080

okay so it's a joint mission NASA and

1238

00:58:37,600 --> 00:58:35,810

the US Geological Survey we're going to

1239

00:58:40,510 --> 00:58:37,610

study predict and understand the

1240

00:58:42,370 --> 00:58:40,520

consequences of land surface changes I

1241

00:58:46,210 --> 00:58:42,380

mentioned the launch date on February

1242

00:58:48,970 --> 00:58:46,220

11th 2013 will be launching off on Space

1243

00:58:52,360 --> 00:58:48,980

Launch Complex 3 at Vandenberg Air Force

1244

00:58:54,250 --> 00:58:52,370

Base and the launch vehicle that the

1245

00:58:56,500 --> 00:58:54,260

launch you see on the screen there is

1246

00:58:58,990 --> 00:58:56,510

the one of the National Reconnaissance

1247

00:59:01,090 --> 00:58:59,000

Orbiter missions that launched on I

1248

00:59:04,030 --> 00:59:01,100

believe 7th September 13th of this year

1249

00:59:05,620 --> 00:59:04,040

so that was complex 3 there and the

1250

00:59:12,430 --> 00:59:05,630

launch vehicle is a United Launch

1251

00:59:17,920 --> 00:59:12,440

Alliance Atlas 5 401 so it's a five-year

1252

00:59:19,630 --> 00:59:17,930

mission that is our design goal is

1253

00:59:23,140 --> 00:59:19,640

five-year mission but we have 10 years

1254

00:59:27,610 --> 00:59:23,150

of propellant with hopes always to

1255

00:59:29,590 --> 00:59:27,620

exceed that design the satellite system

1256

00:59:32,020 --> 00:59:29,600

elements consist of the spacecraft of

1257

00:59:34,480 --> 00:59:32,030

course which provides all the guidance

1258

00:59:37,450 --> 00:59:34,490

for the satellite on orbit and then we

1259

00:59:41,290 --> 00:59:37,460

have two instruments the operational

1260

00:59:45,520 --> 00:59:41,300

land imager is built by ball and the

1261

00:59:48,700 --> 00:59:45,530

thermal infrared sensor is a in-house

1262

00:59:52,330 --> 00:59:48,710

NASA built instrument at Goddard Space

1263

00:59:54,690 --> 00:59:52,340

Flight Center once we get on orbit and

1264

00:59:58,720 --> 00:59:54,700

the satellite is completely checked out

1265

01:00:03,100 --> 00:59:58,730

it'll be transferred to the USGS the

1266

01:00:06,910 --> 01:00:03,110

operational orbit is 705 kilometres 438

1267

01:00:10,960 --> 01:00:06,920

miles it's a near polar orbit and the

1268

01:00:13,150 --> 01:00:10,970

orbit period is 98.9 minutes so we'll do

1269

01:00:14,560 --> 01:00:13,160

a complete revolution of the earth every

1270

01:00:17,800 --> 01:00:14,570

about every hundred minutes

1271

01:00:19,630 --> 01:00:17,810

and then every 16 days we will have

1272

01:00:21,900 --> 01:00:19,640

completely mapped the earth and then

1273

01:00:26,140 --> 01:00:21,910

start that cycle again

1274

01:00:26,800 --> 01:00:26,150

so the swath of that is about 114 miles

1275

01:00:30,450 --> 01:00:26,810

wide

1276

01:00:32,950 --> 01:00:30,460

as it passes over the land so this is

1277

01:00:35,140 --> 01:00:32,960

just to give you an idea the Landsat

1278

01:00:37,020 --> 01:00:35,150

legacy we've been doing this for over 40

1279

01:00:40,350 --> 01:00:37,030

years now so we have 40 years of

1280

01:00:44,980 --> 01:00:40,360

continuous data we launched Landsat 1 in

1281

01:00:47,110 --> 01:00:44,990

1972 and again continuous data Landsat 5

1282

01:00:48,370 --> 01:00:47,120

was just taken out of operation in

1283

01:00:52,360 --> 01:00:48,380

November of last year

1284

01:00:55,650 --> 01:00:52,370

and Landsat 6 failed to reach orbit but

1285

01:00:58,900 --> 01:00:55,660

luckily we had Landsat 7 on orbit and

1286

01:01:01,300 --> 01:00:58,910

Landsat 7 is seven years beyond its

1287

01:01:03,610 --> 01:01:01,310

design life now so it's still

1288

01:01:06,040 --> 01:01:03,620

functioning it's got some some

1289

01:01:09,610 --> 01:01:06,050

instrument degradation but it's still in

1290

01:01:13,060 --> 01:01:09,620

orbit and still returning data but that

1291

01:01:15,580 --> 01:01:13,070

is the need for Idcm to go ahead and get

1292

01:01:22,030 --> 01:01:15,590

it on orbit so we can continue that data

1293

01:01:24,990 --> 01:01:22,040

collection so land cover and land use

1294

01:01:27,730 --> 01:01:25,000

they're changing at unprecedented rates

1295

01:01:31,300 --> 01:01:27,740

driven of course mainly by population

1296

01:01:33,520 --> 01:01:31,310

and climate and we all know that's going

1297

01:01:37,090 --> 01:01:33,530

only going to accelerate going forward

1298

01:01:40,390 --> 01:01:37,100

and they it has profound consequences on

1299

01:01:44,230 --> 01:01:40,400

fiber and food production water resource

1300

01:01:47,230 --> 01:01:44,240

management there's 13 western states and

1301

01:01:49,800 --> 01:01:47,240

26 countries that use Landsat

1302

01:01:52,330 --> 01:01:49,810

scenes for water resource management and

1303

01:01:55,900 --> 01:01:52,340

you saw on the video there they're using

1304

01:01:59,830 --> 01:01:55,910

it to help with their wine crops and

1305

01:02:02,380 --> 01:01:59,840

grape crops so also will be giving

1306

01:02:04,300 --> 01:02:02,390

feedback to the physical climate system

1307

01:02:09,990 --> 01:02:04,310

atmospheric carbon and also energy

1308

01:02:11,920 --> 01:02:10,000

balance so we're living through

1309

01:02:14,620 --> 01:02:11,930

accelerating changes in land use

1310

01:02:17,200 --> 01:02:14,630

resource availability and ecological

1311

01:02:21,280 --> 01:02:17,210

health and we need to monitor these

1312

01:02:24,790 --> 01:02:21,290

changes so we can prepare for future

1313

01:02:26,950 --> 01:02:24,800

trends and this Landsat program fills a

1314

01:02:28,720 --> 01:02:26,960

critical need nish

1315

01:02:32,560 --> 01:02:28,730

and the architecture of land remote

1316

01:02:34,870 --> 01:02:32,570

sensing and geospatial technology so

1317

01:02:37,450 --> 01:02:34,880

making Landsat program operational is

1318

01:02:39,850 --> 01:02:37,460

the best way to guarantee continuity of

1319

01:02:46,150 --> 01:02:39,860

land monitoring monitoring through the

1320

01:02:49,240 --> 01:02:46,160

21st century so the eros Center the

1321

01:02:50,050 --> 01:02:49,250

earth resources and an observation and

1322

01:02:53,530 --> 01:02:50,060

Science Center

1323

01:02:55,270 --> 01:02:53,540

it's in Sioux Falls Ida I'm sorry Sioux

1324

01:02:57,580 --> 01:02:55,280

Falls South Dakota I knew I was going to

1325

01:03:00,430 --> 01:02:57,590

do that and on the left there is a

1326

01:03:03,520 --> 01:03:00,440

picture of that Center and they so the

1327

01:03:06,910 --> 01:03:03,530

all the data is downlink tanned and

1328

01:03:14,500 --> 01:03:06,920

stored and distributed by the eros

1329

01:03:18,690 --> 01:03:14,510

Center next slide so right now the USGS

1330

01:03:22,450 --> 01:03:18,700

has over 3 million Landsat scenes and

1331

01:03:25,870 --> 01:03:22,460

again that spans almost 40 years and up

1332

01:03:28,000 --> 01:03:25,880

until 2008 the state it was fairly

1333

01:03:31,720 --> 01:03:28,010

expensive and then there was a change in

1334

01:03:34,810 --> 01:03:31,730

policy and so this data is now free and

1335

01:03:37,840 --> 01:03:34,820

the distribution has gone from 25,000

1336

01:03:40,360 --> 01:03:37,850

scenes per year to over 3 million seeds

1337

01:03:42,760 --> 01:03:40,370

per year and the u.s. is the only nation

1338

01:03:46,180 --> 01:03:42,770

that's really committed to preserving

1339

01:03:57,789 --> 01:03:46,190

that this multi-deck had a decade old

1340

01:04:02,900 --> 01:04:00,620

so this is the launch vehicle it's built

1341

01:04:05,240 --> 01:04:02,910

by United Launch Alliance on the left

1342

01:04:07,490 --> 01:04:05,250

and the picture you see the ldc

1343

01:04:11,450 --> 01:04:07,500

spacecraft surrounded by the payload

1344

01:04:14,750 --> 01:04:11,460

fairing the payload fairing protects

1345

01:04:19,400 --> 01:04:14,760

that satellite on ascent it'll be the

1346

01:04:23,180 --> 01:04:19,410

configuration is an Atlas 5 401 we've

1347

01:04:25,880 --> 01:04:23,190

got a single centaur engine a single

1348

01:04:28,400 --> 01:04:25,890

rd-10 engines on the Centaur and a

1349

01:04:30,859 --> 01:04:28,410

Russian built rd-180 engine on the on

1350

01:04:33,109 --> 01:04:30,869

the Atlas booster we have an onboard

1351

01:04:35,839 --> 01:04:33,119

video system so we'll be streaming live

1352

01:04:38,390 --> 01:04:35,849

video on ascent

1353

01:04:41,150 --> 01:04:38,400

we've got a camera that's on the booster

1354

01:04:42,890 --> 01:04:41,160

facing up the one facing down and then

1355

01:04:45,109 --> 01:04:42,900

we've got another camera on the Centaur

1356

01:04:46,579 --> 01:04:45,119

facing up so we'll be able to see the

1357

01:04:50,960 --> 01:04:46,589

satellites separate from the launch

1358

01:04:55,520 --> 01:04:50,970

vehicle and just some facts there it'll

1359

01:04:58,250 --> 01:04:55,530

be the 37th Atlas 5 launch so in summary

1360

01:05:01,309 --> 01:04:58,260

the current launch date is February 11th

1361

01:05:03,859 --> 01:05:01,319

the spacecraft is in the thermal vac

1362

01:05:07,490 --> 01:05:03,869

chamber at orbital sciences corporation

1363

01:05:10,150 --> 01:05:07,500

in Gilbert Arizona we're planning to

1364

01:05:13,940 --> 01:05:10,160

ship on December 18th of this year and

1365

01:05:16,730 --> 01:05:13,950

then we'll do the final spacecraft

1366

01:05:18,710 --> 01:05:16,740

processing things like battery charging

1367

01:05:21,589 --> 01:05:18,720

in that it at the Astrotech facility of

1368

01:05:23,359 --> 01:05:21,599

Vandenberg Master Tech for those who

1369

01:05:26,000 --> 01:05:23,369

don't know is a commercial payload

1370

01:05:27,980 --> 01:05:26,010

processing facility and it's used to

1371

01:05:30,440 --> 01:05:27,990

process payloads for the Air Force

1372

01:05:33,260 --> 01:05:30,450

commercial payloads and also NASA

1373

01:05:35,089 --> 01:05:33,270

payloads so the launch vehicle

1374

01:05:37,250 --> 01:05:35,099

activities are on track if you go to

1375

01:05:39,349 --> 01:05:37,260

select 3 right now you'll see the ldcn

1376

01:05:41,660 --> 01:05:39,359

launch vehicle is already stacked at the

1377

01:05:44,870 --> 01:05:41,670

pad they're doing their electrical and

1378

01:05:50,180 --> 01:05:44,880

mechanical preparations for our launch

1379

01:05:52,220 --> 01:05:50,190

on February 11th and lastly we have some

1380

01:05:53,329 --> 01:05:52,230

Landsat web sites for a reference in

1381

01:05:57,230 --> 01:05:53,339

case you want to do a little more

1382

01:06:03,210 --> 01:05:57,240

research so that's all I have for you

1383

01:06:07,330 --> 01:06:05,740

I'm tracing our vans from San Diego

1384

01:06:09,040 --> 01:06:07,340

California by the way if everywhere

1385

01:06:11,290 --> 01:06:09,050

eleventh is three days off my birthday

1386

01:06:12,580 --> 01:06:11,300

so and I'm close so just you know so

1387

01:06:14,350 --> 01:06:12,590

there we go

1388

01:06:16,180 --> 01:06:14,360

but my question for you is we talked

1389

01:06:17,530 --> 01:06:16,190

mostly about agricultural uses but does

1390

01:06:20,530 --> 01:06:17,540

it also keep track of things like sea

1391

01:06:20,830 --> 01:06:20,540

ice and and with glaciers that sort of

1392

01:06:25,750 --> 01:06:20,840

thing

1393

01:06:28,350 --> 01:06:25,760

yes it does you know the interesting

1394

01:06:31,570 --> 01:06:28,360

thing is since the date is free now

1395

01:06:33,280 --> 01:06:31,580

we're finding people are out there that

1396

01:06:35,800 --> 01:06:33,290

are able to obtain this data are finding

1397

01:06:38,710 --> 01:06:35,810

more and more uses for it so we are able

1398

01:06:42,000 --> 01:06:38,720

to determine quite a bit just from the

1399

01:06:45,280 --> 01:06:42,010

thermal infrared sensor and also the

1400

01:06:45,820 --> 01:06:45,290

land imager so it is being used for that

1401

01:06:54,040 --> 01:06:45,830

purpose

1402

01:06:57,040 --> 01:06:54,050

a mark radarman with talking space a

1403

01:06:58,780 --> 01:06:57,050

question for you about what happens from

1404

01:07:01,360 --> 01:06:58,790

launch to orbit and when the satellites

1405

01:07:03,960 --> 01:07:01,370

turned over to the user what kind of

1406

01:07:08,320 --> 01:07:03,970

checkouts are done is there changes in

1407

01:07:10,930 --> 01:07:08,330

the instruments and how they read or is

1408

01:07:14,430 --> 01:07:10,940

it just verifying that they work yeah

1409

01:07:16,180 --> 01:07:14,440

it's mostly verifying that they work

1410

01:07:18,730 --> 01:07:16,190

incidentally I didn't talk too much

1411

01:07:20,200 --> 01:07:18,740

about that but the separation from the

1412

01:07:24,040 --> 01:07:20,210

launch vehicle will be an hour and 18

1413

01:07:25,810 --> 01:07:24,050

minutes after launch and then you know

1414

01:07:27,400 --> 01:07:25,820

it was also on the imposed preparatory

1415

01:07:30,190 --> 01:07:27,410

project which launched from Vandenberg

1416

01:07:32,020 --> 01:07:30,200

last October and it took them about

1417

01:07:33,910 --> 01:07:32,030

three or four months to completely check

1418

01:07:37,240 --> 01:07:33,920

out the satellite so they run through a

1419

01:07:38,770 --> 01:07:37,250

series of tests and also how you

1420

01:07:43,480 --> 01:07:38,780

communicate with the Mission Operations

1421

01:07:45,730 --> 01:07:43,490

Center so so there's a lot of check out

1422

01:07:49,150 --> 01:07:45,740

that needs to be done before you're

1423

01:07:52,360 --> 01:07:49,160

confident that they're not going to have

1424

01:07:54,610 --> 01:07:52,370

any issues once it's turned over at that

1425

01:08:04,360 --> 01:07:54,620

point once it's turned over it should

1426

01:08:11,270 --> 01:08:08,600

hi i'm jonathan yow I was curious is the

1427

01:08:14,510 --> 01:08:11,280

land set does it it's continuous image

1428

01:08:17,420 --> 01:08:14,520

capture or is it task based it's

1429

01:08:22,280 --> 01:08:17,430

continuous image capture so will be in a

1430

01:08:24,680 --> 01:08:22,290

polar orbit and every orbit only takes

1431

01:08:27,740 --> 01:08:24,690

about a hundred minutes and it's 114

1432

01:08:29,780 --> 01:08:27,750

miles wide so you continue that and

1433

01:08:33,260 --> 01:08:29,790

changing your clocking around the earth

1434

01:08:37,190 --> 01:08:33,270

and 16 days later you have completely

1435

01:08:39,770 --> 01:08:37,200

mapped the earth and so whether or not

1436

01:08:41,840 --> 01:08:39,780

all those images are stored and whether

1437

01:08:45,590 --> 01:08:41,850

they would even be able to accommodate

1438

01:08:49,850 --> 01:08:45,600

that that I'm not sure of but yes it's a

1439

01:08:54,890 --> 01:08:49,860

continuous packing and so that's what we

1440

01:08:56,030 --> 01:08:54,900

plan to do hi I'm Kelly huge paths and I

1441

01:08:58,910 --> 01:08:56,040

was just wondering you have said a

1442

01:09:02,600 --> 01:08:58,920

couple of times the data is now free is

1443

01:09:08,360 --> 01:09:02,610

there any future thought into

1444

01:09:12,530 --> 01:09:08,370

commercializing the data that's a good

1445

01:09:16,040 --> 01:09:12,540

question I am not aware of any landsat's

1446

01:09:19,040 --> 01:09:16,050

motto is free data for free society so

1447

01:09:23,150 --> 01:09:19,050

you know it's it's the data is so

1448

01:09:26,750 --> 01:09:23,160

valuable and you know really what it's

1449

01:09:29,540 --> 01:09:26,760

all about is preserving our resources

1450

01:09:33,500 --> 01:09:29,550

and managing our resources here on earth

1451

01:09:37,720 --> 01:09:33,510

so I'm not aware of anything in the

1452

01:09:41,330 --> 01:09:37,730

works to commercialize that availability

1453

01:09:43,340 --> 01:09:41,340

hi it's Laura Blume is it visible from

1454

01:09:45,280 --> 01:09:43,350

you can can you see it go over or is

1455

01:09:47,870 --> 01:09:45,290

there a way to know where it is

1456

01:09:52,790 --> 01:09:47,880

well certainly online you could track it

1457

01:10:01,820 --> 01:09:52,800

I would say it is not visible is if you

1458

01:10:06,480 --> 01:10:05,220

hi Ron sparks well what kind of quality

1459

01:10:10,890 --> 01:10:06,490

and resolution can we expect from this

1460

01:10:13,110 --> 01:10:10,900

camera I don't have those numbers off

1461

01:10:15,840 --> 01:10:13,120

the top of my head I can get those to

1462

01:10:17,190 --> 01:10:15,850

you I actually it's funny you mention

1463

01:10:19,410 --> 01:10:17,200

that because I originally had them on

1464

01:10:24,450 --> 01:10:19,420

the chart and we thought well you know

1465

01:10:32,430 --> 01:10:24,460

that's too much technical detail so see

1466

01:10:34,380 --> 01:10:32,440

me after this event what's the

1467

01:10:36,300 --> 01:10:34,390

difference between launching this out at

1468

01:10:38,850 --> 01:10:36,310

Vandenberg Air Force Base versus here at

1469

01:10:42,270 --> 01:10:38,860

the Cape well we're going into a polar

1470

01:10:44,610 --> 01:10:42,280

orbit so if you look at a globe and you

1471

01:10:47,130 --> 01:10:44,620

look at the geographical location of

1472

01:10:49,350 --> 01:10:47,140

Annenberg Air Force space you launch due

1473

01:10:51,330 --> 01:10:49,360

south you don't go over any land and

1474

01:10:53,910 --> 01:10:51,340

it's the most efficient way to put a

1475

01:10:55,580 --> 01:10:53,920

satellite into polar orbit so from

1476

01:10:58,770 --> 01:10:55,590

Florida we tend to walk to the launch

1477

01:11:07,110 --> 01:10:58,780

satellites into equatorial orbit and we

1478

01:11:15,650 --> 01:11:07,120

launch directly east other questions all

1479

01:11:21,630 --> 01:11:18,660

so this concludes today's portion of the

1480

01:11:22,980 --> 01:11:21,640

NASA social on NASA TV I just want to

1481

01:11:25,440 --> 01:11:22,990

remind everybody that you can follow

1482

01:11:28,080 --> 01:11:25,450

along with NASA we're at NASA on Twitter

1483

01:11:29,460 --> 01:11:28,090

on Google+ where plus NASA and on

1484

01:11:33,210 --> 01:11:29,470

Facebook you can find us at facebook.com

1485

01:11:35,130 --> 01:11:33,220

slash NASA we also run YouTube we

1486

01:11:37,410 --> 01:11:35,140

Ustream a lot of our events and things

1487

01:11:39,600 --> 01:11:37,420

like that we run Flickr we have podcasts

1488

01:11:42,360 --> 01:11:39,610

all over iTunes so you can find us all

1489

01:11:43,620 --> 01:11:42,370

over social media if you want to find

1490

01:11:46,860 --> 01:11:43,630

we're out all of our accounts are you

1491

01:11:49,500 --> 01:11:46,870

can go to wwsz of slash connect and

1492

01:11:51,840 --> 01:11:49,510

connect and collaborate with us as we go

1493

01:11:54,330 --> 01:11:51,850

about exploring space so thank you all

1494

01:11:56,220 --> 01:11:54,340

very much for following on line again

1495

01:11:59,790 --> 01:11:56,230

tomorrow's hashtag for the Atlantis

1496

01:12:01,710 --> 01:11:59,800

rollover is pound Atlantis and we look

1497

01:12:03,630 --> 01:12:01,720

forward to having a successful move of

1498

01:12:05,460 --> 01:12:03,640

the space shuttle so thank you all very

1499

01:12:07,440 --> 01:12:05,470

much for joining us today and thanks for