
nter
John

1
00:00:05,349 --> 00:00:03,669
good morning and welcome to johnson

2
00:00:06,950 --> 00:00:05,359
space center we have here today

3
00:00:08,870 --> 00:00:06,960
representatives from nasa and the

4
00:00:10,470 --> 00:00:08,880
european space agency to talk about a

5
00:00:13,589 --> 00:00:10,480
new agreement sign that's going to get

6
00:00:15,350 --> 00:00:13,599
issa involved in the work on nasa's new

7
00:00:17,029 --> 00:00:15,360
spacecraft orion that's going to take

8
00:00:17,990 --> 00:00:17,039
humans farther than they've ever been

9
00:00:19,990 --> 00:00:18,000
before

10
00:00:22,630 --> 00:00:20,000
here to tell us about that today we have

11
00:00:25,029 --> 00:00:22,640
to my left bill gerstenmaier

12
00:00:27,349 --> 00:00:25,039
who is the nasa associate administrator

13
00:00:29,830 --> 00:00:27,359

for human exploration and operations

14
00:00:31,429 --> 00:00:29,840
then going down the line tomas ryder

15
00:00:34,069 --> 00:00:31,439
esa's director for human space flight

16
00:00:36,790 --> 00:00:34,079
and operations and mark guyer the orion

17
00:00:39,750 --> 00:00:36,800
program manager and bernardo potti who

18
00:00:41,350 --> 00:00:39,760
is the esa manager for iss operations

19
00:00:43,430 --> 00:00:41,360
we'll let them start out with a little

20
00:00:45,270 --> 00:00:43,440
bit of introduction on what exactly is

21
00:00:47,350 --> 00:00:45,280
going on and uh then we'll take

22
00:00:50,069 --> 00:00:47,360
questions here from the audience thanks

23
00:00:52,150 --> 00:00:50,079
okay thanks it you know as you described

24
00:00:54,630 --> 00:00:52,160
the orion capsule is the the vehicle

25
00:00:56,790 --> 00:00:54,640
that's going to take us really beyond

26
00:00:58,869 --> 00:00:56,800
low earth orbit and allow us to move

27
00:00:59,590 --> 00:00:58,879
human presence out into the solar system

28
00:01:01,830 --> 00:00:59,600
and

29
00:01:03,830 --> 00:01:01,840
sitting behind that orion capsule sits a

30
00:01:05,030 --> 00:01:03,840
device called a service module that

31
00:01:07,590 --> 00:01:05,040
provides

32
00:01:10,630 --> 00:01:07,600
some critical supplies and propulsion

33
00:01:12,710 --> 00:01:10,640
for the for the orion capsule itself and

34
00:01:15,109 --> 00:01:12,720
what we've we've done is we've got an

35
00:01:16,789 --> 00:01:15,119
agreement with our european partners to

36
00:01:19,350 --> 00:01:16,799
essentially

37
00:01:21,429 --> 00:01:19,360
have them develop

38
00:01:23,429 --> 00:01:21,439

the first service module and portions of

39
00:01:24,550 --> 00:01:23,439
the second service module for the orion

40
00:01:27,190 --> 00:01:24,560
capsule and

41
00:01:29,510 --> 00:01:27,200
and this has been a really pretty uh

42
00:01:31,190 --> 00:01:29,520
amazing activity we'll describe it and

43
00:01:33,830 --> 00:01:31,200
discuss with you more as you ask us some

44
00:01:35,670 --> 00:01:33,840
questions i had the privilege today of

45
00:01:38,469 --> 00:01:35,680
attending a ceremony we did an award

46
00:01:40,469 --> 00:01:38,479
ceremony for the orion team and the

47
00:01:41,830 --> 00:01:40,479
european team for

48
00:01:44,149 --> 00:01:41,840
the amount of work that they've done in

49
00:01:46,230 --> 00:01:44,159
getting prepared to get to this moment

50
00:01:47,590 --> 00:01:46,240
you know to to make a commitment this

51
00:01:49,350 --> 00:01:47,600
big there needs to be a lot of

52
00:01:51,030 --> 00:01:49,360
engineering done behind the scenes to

53
00:01:53,030 --> 00:01:51,040
make sure that this is really the right

54
00:01:54,870 --> 00:01:53,040
thing to go do can we really integrate

55
00:01:56,950 --> 00:01:54,880
these two vehicles together where you

56
00:01:59,109 --> 00:01:56,960
define the interfaces how do you make

57
00:02:00,950 --> 00:01:59,119
this happen and and the teams have done

58
00:02:02,950 --> 00:02:00,960
just a tremendous job over the past

59
00:02:04,950 --> 00:02:02,960
several months of figuring out all those

60
00:02:07,109 --> 00:02:04,960
technical interfaces we're also

61
00:02:09,430 --> 00:02:07,119
intergovernmental agreements that needed

62
00:02:10,869 --> 00:02:09,440
to get put in place some some other

63
00:02:12,309 --> 00:02:10,879

activities that needed to be done and

64
00:02:14,229 --> 00:02:12,319
and we spent a little bit of time today

65
00:02:16,150 --> 00:02:14,239
to recognize the folks the teams that

66
00:02:17,510 --> 00:02:16,160
actually did all that work and it was

67
00:02:18,949 --> 00:02:17,520
pretty amazing just sitting there

68
00:02:21,510 --> 00:02:18,959
watching the

69
00:02:23,350 --> 00:02:21,520
the awards get passed out from the

70
00:02:24,390 --> 00:02:23,360
italians that were here europeans were

71
00:02:30,790 --> 00:02:24,400
here

72
00:02:32,949 --> 00:02:30,800
um to just to see this international

73
00:02:34,949 --> 00:02:32,959
team come together and and be

74
00:02:36,869 --> 00:02:34,959
this commitment so what we're going to

75
00:02:38,710 --> 00:02:36,879
describe and what's represented by this

76
00:02:41,030 --> 00:02:38,720
signature is really much bigger than

77
00:02:43,270 --> 00:02:41,040
just a simple signature it is really an

78
00:02:44,949 --> 00:02:43,280
integration of the the service module

79
00:02:46,869 --> 00:02:44,959
with the orion capsule as we move

80
00:02:48,790 --> 00:02:46,879
forward so it was pretty amazing to see

81
00:02:51,270 --> 00:02:48,800
that the other thing that was also

82
00:02:54,150 --> 00:02:51,280
intriguing was you know this is part of

83
00:02:56,390 --> 00:02:54,160
iss the some of the the funding for this

84
00:02:58,470 --> 00:02:56,400
is coming through the common systems ops

85
00:03:00,470 --> 00:02:58,480
costs that that are owed for the station

86
00:03:02,470 --> 00:03:00,480
partnership so that enabled this

87
00:03:05,589 --> 00:03:02,480
cooperation but i think more importantly

88
00:03:07,509 --> 00:03:05,599

than that that financial piece is just

89
00:03:09,910 --> 00:03:07,519
the experience that was gained through

90
00:03:11,670 --> 00:03:09,920
the international space station to to

91
00:03:13,190 --> 00:03:11,680
build this wonderful facility we have on

92
00:03:15,750 --> 00:03:13,200
orbit we needed to work a lot of

93
00:03:17,589 --> 00:03:15,760
technical issues a lot of technical

94
00:03:19,110 --> 00:03:17,599
problems and that experience gained and

95
00:03:21,910 --> 00:03:19,120
that trust that came between our

96
00:03:24,149 --> 00:03:21,920
european partners and our nasa teams

97
00:03:25,990 --> 00:03:24,159
allowed us to really go ahead and put

98
00:03:28,149 --> 00:03:26,000
together this service module agreement

99
00:03:30,229 --> 00:03:28,159
that you see today so so again as we

100
00:03:32,949 --> 00:03:30,239
talk about space station being that

101
00:03:34,710 --> 00:03:32,959
first step in exploration it is

102
00:03:36,309 --> 00:03:34,720
physically the kind of the first step in

103
00:03:38,149 --> 00:03:36,319
exploration but i would say it also

104
00:03:39,670 --> 00:03:38,159
paved the way in terms of international

105
00:03:42,229 --> 00:03:39,680
agreements international working

106
00:03:45,110 --> 00:03:42,239
together contractors working together to

107
00:03:47,350 --> 00:03:45,120
really take that cooperation to a

108
00:03:49,910 --> 00:03:47,360
different level internationally so again

109
00:03:51,910 --> 00:03:49,920
just a tremendous day to participate in

110
00:03:53,830 --> 00:03:51,920
that awards activity than to be here for

111
00:03:55,350 --> 00:03:53,840
this press conference so i look forward

112
00:03:57,670 --> 00:03:55,360
to your questions and i'll turn it over

113
00:03:59,509 --> 00:03:57,680

to thomas for some opening remarks

114
00:04:01,429 --> 00:03:59,519
thomas thank you very much bill good

115
00:04:03,350 --> 00:04:01,439
morning ladies and gentlemen also from

116
00:04:06,229 --> 00:04:03,360
my side i have to say this is a

117
00:04:09,270 --> 00:04:06,239
remarkable moment for asa

118
00:04:11,830 --> 00:04:09,280
you can imagine that the iss cooperation

119
00:04:13,910 --> 00:04:11,840
in the past years has already shown some

120
00:04:17,110 --> 00:04:13,920
evolution and this is another step of

121
00:04:19,189 --> 00:04:17,120
this evolution as bill already has

122
00:04:21,590 --> 00:04:19,199
explained here i would even say it's a

123
00:04:23,990 --> 00:04:21,600
new page we are opening a new page in

124
00:04:27,030 --> 00:04:24,000
the transatlantic corporation

125
00:04:29,030 --> 00:04:27,040
for asa being involved in the building

126
00:04:31,990 --> 00:04:29,040
of a space transportation system

127
00:04:34,150 --> 00:04:32,000
us-based transportation system which

128
00:04:37,510 --> 00:04:34,160
will give a perspective for humans to go

129
00:04:39,030 --> 00:04:37,520
beyond low earth orbit certainly

130
00:04:41,270 --> 00:04:39,040
low earth orbit will remain a

131
00:04:43,670 --> 00:04:41,280
destination for us we have a fantastic

132
00:04:46,230 --> 00:04:43,680
infrastructure in orbit which we will be

133
00:04:48,070 --> 00:04:46,240
utilizing in the next years to the end

134
00:04:50,870 --> 00:04:48,080
of this decade certainly beyond this

135
00:04:53,510 --> 00:04:50,880
decade there will be the need also to

136
00:04:55,749 --> 00:04:53,520
utilize low earth orbit for

137
00:04:58,230 --> 00:04:55,759
various scientific reasons but another

138
00:05:00,070 --> 00:04:58,240

aspect is of course to bring humans

139
00:05:02,310 --> 00:05:00,080
beyond low earth orbit to new

140
00:05:03,749 --> 00:05:02,320
destinations and this cooperation i

141
00:05:05,749 --> 00:05:03,759
think

142
00:05:07,270 --> 00:05:05,759
brings us into

143
00:05:10,150 --> 00:05:07,280
this endeavor

144
00:05:12,310 --> 00:05:10,160
it is building upon atv heritage as we

145
00:05:14,710 --> 00:05:12,320
say you are very well aware that asa is

146
00:05:17,270 --> 00:05:14,720
providing supply vehicles

147
00:05:19,749 --> 00:05:17,280
to the international space station the

148
00:05:22,070 --> 00:05:19,759
fourth of these atvs will be launched in

149
00:05:24,390 --> 00:05:22,080
april this year

150
00:05:25,590 --> 00:05:24,400
the last one will be launched next year

151
00:05:27,909 --> 00:05:25,600
and

152
00:05:31,029 --> 00:05:27,919
based on the experience that we have

153
00:05:32,870 --> 00:05:31,039
gathered in asia in european industry we

154
00:05:35,590 --> 00:05:32,880
are now building upon that in the

155
00:05:36,550 --> 00:05:35,600
context of this cooperation

156
00:05:39,110 --> 00:05:36,560
also

157
00:05:39,990 --> 00:05:39,120
coming to this award ceremony this

158
00:05:40,790 --> 00:05:40,000
morning

159
00:05:43,110 --> 00:05:40,800
for

160
00:05:45,430 --> 00:05:43,120
i think both teams from our side

161
00:05:48,230 --> 00:05:45,440
certainly it was a running start

162
00:05:51,510 --> 00:05:48,240
um isa has been working after the last

163
00:05:54,150 --> 00:05:51,520

ministerial conference in 2008 on a on a

164
00:05:55,590 --> 00:05:54,160
concept study arv and we very much

165
00:05:58,710 --> 00:05:55,600
benefited

166
00:06:01,350 --> 00:05:58,720
from this study to come together with a

167
00:06:03,590 --> 00:06:01,360
technical team from nasa to really pick

168
00:06:05,909 --> 00:06:03,600
up very quickly and prepare

169
00:06:07,510 --> 00:06:05,919
all the needed work in order to prepare

170
00:06:09,110 --> 00:06:07,520
the decision in our ministerial

171
00:06:10,309 --> 00:06:09,120
conference

172
00:06:12,150 --> 00:06:10,319
also

173
00:06:13,110 --> 00:06:12,160
as a follow-up of this decision there

174
00:06:15,270 --> 00:06:13,120
was an

175
00:06:18,710 --> 00:06:15,280
implementation agreement

176
00:06:20,629 --> 00:06:18,720
elaborated by both sides it was endorsed

177
00:06:23,270 --> 00:06:20,639
by the u.s state department it was

178
00:06:25,430 --> 00:06:23,280
endorsed by the aesa council in

179
00:06:27,670 --> 00:06:25,440
december last year and now we are really

180
00:06:29,510 --> 00:06:27,680
set to go ahead we are very much aware

181
00:06:31,909 --> 00:06:29,520
that a lot of

182
00:06:34,230 --> 00:06:31,919
difficult and complicated work is still

183
00:06:36,629 --> 00:06:34,240
ahead of us but that is very inspiring

184
00:06:41,189 --> 00:06:36,639
and i think all of us are looking

185
00:06:44,309 --> 00:06:42,550
thank you

186
00:06:45,110 --> 00:06:44,319
so it's a great day for ryan we get to

187
00:06:47,189 --> 00:06:45,120
add

188
00:06:49,749 --> 00:06:47,199

key experience on the easter side that

189
00:06:52,469 --> 00:06:49,759
as as mr ryder mentioned came from their

190
00:06:54,230 --> 00:06:52,479
iss experience in atv and before

191
00:06:55,909 --> 00:06:54,240
um i thought it was important for us to

192
00:06:57,029 --> 00:06:55,919
be clear on terminology so i've got a

193
00:06:58,790 --> 00:06:57,039
slide

194
00:07:00,830 --> 00:06:58,800
to show a little bit there you go uh go

195
00:07:01,909 --> 00:07:00,840
ahead and go to the next

196
00:07:03,270 --> 00:07:01,919
okay it's

197
00:07:05,189 --> 00:07:03,280
very good and it might be hard to see

198
00:07:06,790 --> 00:07:05,199
but these are these uh would be

199
00:07:08,790 --> 00:07:06,800
available to hand out when we talk about

200
00:07:10,150 --> 00:07:08,800
the different parts of the

201
00:07:12,309 --> 00:07:10,160
orion it's really important i need to

202
00:07:14,950 --> 00:07:12,319
pull on the part of how important this

203
00:07:16,710 --> 00:07:14,960
is element is to the orion mission and

204
00:07:18,230 --> 00:07:16,720
also relate it to

205
00:07:20,790 --> 00:07:18,240
uh the definition of the different parts

206
00:07:22,710 --> 00:07:20,800
of orion so obviously at the at the top

207
00:07:24,950 --> 00:07:22,720
is the is the crew module and i'll talk

208
00:07:27,029 --> 00:07:24,960
a little bit about that uh later as as a

209
00:07:28,629 --> 00:07:27,039
little bit about eft one in a minute but

210
00:07:30,790 --> 00:07:28,639
there are other elements

211
00:07:32,469 --> 00:07:30,800
of the orion that make up the service

212
00:07:33,990 --> 00:07:32,479
module the service so the service module

213
00:07:35,589 --> 00:07:34,000

is really everything below the crew

214
00:07:37,589 --> 00:07:35,599
module and now we've

215
00:07:39,589 --> 00:07:37,599
shaded the stuff in gray

216
00:07:42,309 --> 00:07:39,599
that will retain will will remain with

217
00:07:44,230 --> 00:07:42,319
nasa there's a crew module adapter which

218
00:07:45,749 --> 00:07:44,240
is a very tight tolerance with the heat

219
00:07:47,670 --> 00:07:45,759
shield so we're going to retain that

220
00:07:49,909 --> 00:07:47,680
piece and there's fairings and an

221
00:07:51,830 --> 00:07:49,919
adapter to the launch vehicle that we're

222
00:07:54,150 --> 00:07:51,840
actually going to fly on eft-1 and in

223
00:07:55,749 --> 00:07:54,160
this deal we we we leave that with nasa

224
00:07:56,950 --> 00:07:55,759
right i think that's the best economical

225
00:07:58,869 --> 00:07:56,960
thing to do something we've already

226
00:08:01,110 --> 00:07:58,879
built we're going to keep but issa now

227
00:08:03,189 --> 00:08:01,120
will provide that core as you see kind

228
00:08:05,670 --> 00:08:03,199
of the highlighted white area in there

229
00:08:07,350 --> 00:08:05,680
in the middle which has the propulsion

230
00:08:08,950 --> 00:08:07,360
power generation

231
00:08:11,029 --> 00:08:08,960
radiators

232
00:08:12,869 --> 00:08:11,039
consumable storage so it's obviously

233
00:08:15,510 --> 00:08:12,879
it's a key part of the service module

234
00:08:20,629 --> 00:08:18,390
most of the gray will fly on eft 1 and

235
00:08:23,670 --> 00:08:20,639
the esa part will allow us to move on to

236
00:08:24,629 --> 00:08:23,680
em-1 which is the flight in 2017.

237
00:08:26,070 --> 00:08:24,639
so

238
00:08:27,670 --> 00:08:26,080

mr reiter said it very well we didn't

239
00:08:29,270 --> 00:08:27,680
just start yesterday on this the team

240
00:08:31,430 --> 00:08:29,280
has been working this concept for a

241
00:08:33,190 --> 00:08:31,440
while uh we did actually the system

242
00:08:34,949 --> 00:08:33,200
design review last year they're here

243
00:08:37,430 --> 00:08:34,959
this week actually working details to

244
00:08:39,110 --> 00:08:37,440
get us to a preliminary design review

245
00:08:41,589 --> 00:08:39,120
um and to move us forward i think it's

246
00:08:44,310 --> 00:08:41,599
great that we're using the iss

247
00:08:45,750 --> 00:08:44,320
experience not just technically but

248
00:08:47,990 --> 00:08:45,760
working together a lot of the same

249
00:08:49,670 --> 00:08:48,000
experts are working on both sides and we

250
00:08:51,990 --> 00:08:49,680
get to apply that to this great

251
00:08:54,470 --> 00:08:52,000
exploration mission

252
00:08:55,910 --> 00:08:54,480
orion of course is not not just a

253
00:08:58,630 --> 00:08:55,920
powerpoint picture like that we're

254
00:09:00,150 --> 00:08:58,640
actually flying in 20 months uh eft one

255
00:09:02,070 --> 00:09:00,160
is flying in 20 months and we're down at

256
00:09:05,030 --> 00:09:02,080
the cape uh installing hardware as we

257
00:09:07,030 --> 00:09:05,040
speak and doing software testing in

258
00:09:08,790 --> 00:09:07,040
denver so it's a great time exciting

259
00:09:11,430 --> 00:09:08,800
time for us both near term and also now

260
00:09:13,110 --> 00:09:11,440
with this great new agreement

261
00:09:15,509 --> 00:09:13,120
becoming more international as we go

262
00:09:17,829 --> 00:09:15,519
beyond low-earth orbit

263
00:09:19,910 --> 00:09:17,839

bernardo

264
00:09:23,030 --> 00:09:19,920
just a few remark

265
00:09:24,550 --> 00:09:23,040
i would like to say that uh yes thanks

266
00:09:26,630 --> 00:09:24,560
to the approval

267
00:09:28,230 --> 00:09:26,640
of the program by our member states and

268
00:09:29,910 --> 00:09:28,240
by the signature of the

269
00:09:32,070 --> 00:09:29,920
implementing arrangement between naz and

270
00:09:34,150 --> 00:09:32,080
esa now we are starting to ramp up our

271
00:09:35,269 --> 00:09:34,160
teams we are placing industrial

272
00:09:37,430 --> 00:09:35,279
contracts

273
00:09:39,509 --> 00:09:37,440
and we are facing the

274
00:09:40,710 --> 00:09:39,519
very challenging schedule that will

275
00:09:44,470 --> 00:09:40,720
bring us

276
00:09:45,269 --> 00:09:44,480
to pdr uh by the second part of the year

277
00:09:47,350 --> 00:09:45,279
so

278
00:09:50,310 --> 00:09:47,360
it's all the team are extremely excited

279
00:09:52,630 --> 00:09:50,320
and enthusiastic to carry on on indies

280
00:09:53,829 --> 00:09:52,640
in endeavour and

281
00:09:55,350 --> 00:09:53,839
well

282
00:09:57,030 --> 00:09:55,360
they are here this week

283
00:09:58,870 --> 00:09:57,040
making good progress

284
00:10:01,430 --> 00:09:58,880
and we look forward for

285
00:10:03,670 --> 00:10:01,440
the pdr to confirm that all the

286
00:10:06,470 --> 00:10:03,680
expectations that we are building up are

287
00:10:09,430 --> 00:10:06,480
going to materialize further thank you

288
00:10:12,710 --> 00:10:10,870

okay we're going to take questions now

289
00:10:14,389 --> 00:10:12,720
we'll start here in the room with the

290
00:10:15,990 --> 00:10:14,399
reporters in attendance and then after

291
00:10:16,949 --> 00:10:16,000
that we'll take questions from the phone

292
00:10:20,870 --> 00:10:16,959
bridge

293
00:10:21,829 --> 00:10:20,880
we can start with mark crowe

294
00:10:25,269 --> 00:10:21,839
thanks

295
00:10:26,630 --> 00:10:25,279
mark caro for aviation week

296
00:10:28,870 --> 00:10:26,640
this puts

297
00:10:32,870 --> 00:10:28,880
isa in the critical path for the early

298
00:10:35,110 --> 00:10:32,880
development of the orion and

299
00:10:38,310 --> 00:10:35,120
potentially the rest of the

300
00:10:41,110 --> 00:10:38,320
sls and so forth i wonder if you might

301
00:10:43,509 --> 00:10:41,120
talk about the significance

302
00:10:45,670 --> 00:10:43,519
of that that's

303
00:10:46,389 --> 00:10:45,680
a different element in the development

304
00:10:48,069 --> 00:10:46,399
and

305
00:10:49,670 --> 00:10:48,079
what does that mean in a big picture

306
00:10:53,110 --> 00:10:49,680
sense and i think that's from mr

307
00:10:55,430 --> 00:10:53,120
gerstenmaier and mr rider

308
00:10:57,190 --> 00:10:55,440
again i think you characterized it uh

309
00:10:59,110 --> 00:10:57,200
very well we've we put issa in a

310
00:11:01,829 --> 00:10:59,120
critical path and we don't do that

311
00:11:02,949 --> 00:11:01,839
lightly so as we talked about we did

312
00:11:09,590 --> 00:11:02,959
this

313
00:11:11,910 --> 00:11:09,600

together and as mark showed you in the

314
00:11:13,829 --> 00:11:11,920
graphic we were also pretty smart about

315
00:11:15,910 --> 00:11:13,839
how we picked the interfaces so if you

316
00:11:17,990 --> 00:11:15,920
look at the way the interfaces are

317
00:11:20,870 --> 00:11:18,000
picked the primary load carrying

318
00:11:23,110 --> 00:11:20,880
capability is is through that spacecraft

319
00:11:25,590 --> 00:11:23,120
adapter through those jettisonable

320
00:11:27,030 --> 00:11:25,600
fairings on the outside then up to that

321
00:11:29,190 --> 00:11:27,040
orion

322
00:11:31,190 --> 00:11:29,200
module adapter that is critical with the

323
00:11:33,509 --> 00:11:31,200
heat shield so that primary load path is

324
00:11:35,910 --> 00:11:33,519
through the outside so that helps ease

325
00:11:37,590 --> 00:11:35,920
some of the integration activities so we

326
00:11:39,509 --> 00:11:37,600
didn't want to give them a technical

327
00:11:41,350 --> 00:11:39,519
challenge it would be so difficult that

328
00:11:43,829 --> 00:11:41,360
it would be almost impossible for them

329
00:11:45,590 --> 00:11:43,839
to pull this off so we we worked very

330
00:11:47,509 --> 00:11:45,600
closely and what's interesting is it

331
00:11:48,870 --> 00:11:47,519
wasn't just the nasa teams we actually

332
00:11:50,389 --> 00:11:48,880
brought in the contractors that are

333
00:11:51,990 --> 00:11:50,399
going to be doing this work and we had

334
00:11:54,389 --> 00:11:52,000
them help us figure out where to put

335
00:11:56,310 --> 00:11:54,399
those interfaces so we put them in the

336
00:11:57,670 --> 00:11:56,320
critical path i would tell you we

337
00:11:59,190 --> 00:11:57,680
probably would not have done that

338
00:12:01,750 --> 00:11:59,200

without the experience we've had in

339
00:12:04,069 --> 00:12:01,760
space station on space station we've

340
00:12:05,430 --> 00:12:04,079
learned the real meaning of cooperation

341
00:12:07,750 --> 00:12:05,440
it isn't

342
00:12:10,069 --> 00:12:07,760
actually not counting on your partner to

343
00:12:11,030 --> 00:12:10,079
be there it's actually giving up a piece

344
00:12:14,150 --> 00:12:11,040
of the

345
00:12:16,310 --> 00:12:14,160
you're going to do and actually counting

346
00:12:18,069 --> 00:12:16,320
on that partner to deliver so this

347
00:12:20,310 --> 00:12:18,079
wasn't done lightly i'm confident that

348
00:12:22,389 --> 00:12:20,320
the isa team and industrial team and the

349
00:12:24,550 --> 00:12:22,399
nasa teams and the contractors teams can

350
00:12:27,190 --> 00:12:24,560
deliver on this thing but this will

351
00:12:29,350 --> 00:12:27,200
build us that first step so when we talk

352
00:12:31,350 --> 00:12:29,360
about international cooperation

353
00:12:33,030 --> 00:12:31,360
it's not talked about lightly here we

354
00:12:35,430 --> 00:12:33,040
are really doing international

355
00:12:37,829 --> 00:12:35,440
cooperation and as we push humans out

356
00:12:39,430 --> 00:12:37,839
into the into the solar system we're

357
00:12:42,790 --> 00:12:39,440
doing it internationally and this is

358
00:12:45,430 --> 00:12:42,800
that first step so i i think it's uh

359
00:12:48,470 --> 00:12:45,440
you know it's not 100 comfortable but

360
00:12:50,150 --> 00:12:48,480
i'm never 100 comfortable so it's okay

361
00:12:53,269 --> 00:12:50,160
and then we'll we'll see how it goes but

362
00:12:55,670 --> 00:12:53,279
we've done it smartly and thomas i think

363
00:12:57,829 --> 00:12:55,680

yes thank you very much bill i would

364
00:12:59,829 --> 00:12:57,839
just like to stress again what uh also

365
00:13:01,750 --> 00:12:59,839
you will have mentioned before i mean

366
00:13:03,910 --> 00:13:01,760
exploration in future

367
00:13:06,069 --> 00:13:03,920
i think will become more and more an

368
00:13:08,389 --> 00:13:06,079
international endeavor when we are

369
00:13:10,230 --> 00:13:08,399
talking about cooperation it is not just

370
00:13:12,150 --> 00:13:10,240
because of political reasons but we are

371
00:13:14,150 --> 00:13:12,160
looking for synergies in technical in

372
00:13:17,269 --> 00:13:14,160
programmatic way and that is very very

373
00:13:19,990 --> 00:13:17,279
good example exactly in that context as

374
00:13:21,509 --> 00:13:20,000
i mentioned in my introductory statement

375
00:13:24,949 --> 00:13:21,519
asa has

376
00:13:27,030 --> 00:13:24,959
proven to be a reliable partner to

377
00:13:30,310 --> 00:13:27,040
in the context of the space station

378
00:13:33,750 --> 00:13:30,320
program we are operating together with

379
00:13:36,790 --> 00:13:33,760
all iss partners our infrastructure

380
00:13:40,150 --> 00:13:36,800
in orbit and i think based on that based

381
00:13:43,110 --> 00:13:40,160
on specifically the atv heritage i think

382
00:13:44,550 --> 00:13:43,120
this is a good choice to make in order

383
00:13:46,629 --> 00:13:44,560
to

384
00:13:48,629 --> 00:13:46,639
exploit synergies that have been

385
00:13:51,750 --> 00:13:48,639
developed in the past and that can be

386
00:13:55,030 --> 00:13:51,760
beneficial for um reaching common

387
00:13:58,069 --> 00:13:55,910
okay

388
00:13:59,990 --> 00:13:58,079

captain quinn from ktrk here in houston

389
00:14:01,509 --> 00:14:00,000
uh for mr gerstenmaier

390
00:14:02,389 --> 00:14:01,519
number one you mentioned that you're not

391
00:14:04,550 --> 00:14:02,399
100

392
00:14:06,629 --> 00:14:04,560
comfortable with this can you expand on

393
00:14:08,710 --> 00:14:06,639
that please and explain

394
00:14:10,150 --> 00:14:08,720
why there's still that

395
00:14:12,389 --> 00:14:10,160
that lack of 100

396
00:14:14,310 --> 00:14:12,399
and then number two can you explain also

397
00:14:16,710 --> 00:14:14,320
for folks at home big picture what is

398
00:14:18,870 --> 00:14:16,720
this what does this mean for our ability

399
00:14:21,509 --> 00:14:18,880
to get beyond lower earth orbit for the

400
00:14:23,590 --> 00:14:21,519
first time in 40 years

401
00:14:25,350 --> 00:14:23,600
yeah i guess uh you know my

402
00:14:29,269 --> 00:14:25,360
my comfortable words are are really kind

403
00:14:31,350 --> 00:14:29,279
of my words right in in our in our world

404
00:14:32,790 --> 00:14:31,360
you know we're we're really pushing

405
00:14:34,710 --> 00:14:32,800
challenges and we're doing things that

406
00:14:37,670 --> 00:14:34,720
have really not been done before you

407
00:14:39,750 --> 00:14:37,680
know this capsule we're talking about is

408
00:14:41,430 --> 00:14:39,760
going to go beyond

409
00:14:43,910 --> 00:14:41,440
beyond the distance to the moon we're

410
00:14:45,590 --> 00:14:43,920
going to go extend beyond that it's

411
00:14:48,310 --> 00:14:45,600
going to eventually be the vehicle we

412
00:14:50,150 --> 00:14:48,320
will use to go to asteroids and to mars

413
00:14:51,910 --> 00:14:50,160

and if i told you today i'm comfortable

414
00:14:54,389 --> 00:14:51,920
with all this stuff and all the design

415
00:14:56,629 --> 00:14:54,399
sits there you should be asking me

416
00:14:59,269 --> 00:14:56,639
how can you be comfortable and so i

417
00:15:01,590 --> 00:14:59,279
think as a common person looking forward

418
00:15:04,069 --> 00:15:01,600
these are challenges but we're not

419
00:15:05,829 --> 00:15:04,079
foolish right and and that's why we

420
00:15:07,829 --> 00:15:05,839
chose the interfaces where we did that's

421
00:15:10,710 --> 00:15:07,839
why we had the contractors talk to each

422
00:15:12,949 --> 00:15:10,720
other to evaluate up front to make sure

423
00:15:14,629 --> 00:15:12,959
things that are all right that are there

424
00:15:17,269 --> 00:15:14,639
we've got you know we've got a very

425
00:15:19,430 --> 00:15:17,279
tight schedule to do it as as mark and

426
00:15:21,269 --> 00:15:19,440
bernardo talked about the preliminary

427
00:15:23,990 --> 00:15:21,279
design review later this year i mean

428
00:15:25,670 --> 00:15:24,000
that's that is really fast in terms of

429
00:15:27,750 --> 00:15:25,680
development but again we've done a lot

430
00:15:29,509 --> 00:15:27,760
of preliminary work up front we're

431
00:15:32,710 --> 00:15:29,519
taking advantage of some heritage hard

432
00:15:34,550 --> 00:15:32,720
work hardware so all that that works but

433
00:15:36,790 --> 00:15:34,560
but i'm a realist in the fact that i

434
00:15:38,550 --> 00:15:36,800
know that this won't be easy and and if

435
00:15:39,910 --> 00:15:38,560
i was comfortable and i was up here then

436
00:15:42,150 --> 00:15:39,920
you should be questioning me what's

437
00:15:44,150 --> 00:15:42,160
wrong with me so so the fact that i tell

438
00:15:45,749 --> 00:15:44,160

you i'm uncomfortable that's exactly

439
00:15:47,590 --> 00:15:45,759
where i want to be that's where i want

440
00:15:50,629 --> 00:15:47,600
my team i want them pushing we're going

441
00:15:52,389 --> 00:15:50,639
to be innovative creative push forward

442
00:15:54,389 --> 00:15:52,399
and work in an international and

443
00:15:55,350 --> 00:15:54,399
cooperative manner and we'll do that but

444
00:15:57,990 --> 00:15:55,360
it doesn't say you have to be

445
00:16:00,710 --> 00:15:58,000
comfortable when you go do that

446
00:16:03,590 --> 00:16:00,720
okay gina um this question is for bill

447
00:16:05,030 --> 00:16:03,600
and for mark how tough is it to design a

448
00:16:06,710 --> 00:16:05,040
system like this when you don't know

449
00:16:07,990 --> 00:16:06,720
exactly where you're going you know

450
00:16:09,189 --> 00:16:08,000
you're going to go to the space station

451
00:16:11,990 --> 00:16:09,199
but you don't know if you're going to

452
00:16:14,230 --> 00:16:12,000
the moon or mars or an asteroid i mean

453
00:16:16,629 --> 00:16:14,240
mark when i interviewed you last year

454
00:16:18,150 --> 00:16:16,639
the plan was an asteroid well

455
00:16:19,590 --> 00:16:18,160
you know how do you design a vehicle

456
00:16:21,189 --> 00:16:19,600
when you don't really know where it's

457
00:16:23,269 --> 00:16:21,199
going to go

458
00:16:25,509 --> 00:16:23,279
you know i would say we we have the

459
00:16:27,910 --> 00:16:25,519
basic requirements understood we know

460
00:16:29,829 --> 00:16:27,920
what uh change in velocity or how much

461
00:16:31,829 --> 00:16:29,839
propellant this vehicle needs to carry

462
00:16:33,829 --> 00:16:31,839
we know what its basic structural load

463
00:16:35,590 --> 00:16:33,839

capability is we know how long the life

464
00:16:37,829 --> 00:16:35,600
support systems need to be there we know

465
00:16:40,310 --> 00:16:37,839
how many crew we're going to carry so we

466
00:16:42,389 --> 00:16:40,320
know all those parameters so

467
00:16:44,550 --> 00:16:42,399
you know you know you don't design a car

468
00:16:46,710 --> 00:16:44,560
to just go to the grocery store you

469
00:16:48,550 --> 00:16:46,720
design a car that can go to the grocery

470
00:16:50,550 --> 00:16:48,560
store and go to the shopping mall and

471
00:16:52,310 --> 00:16:50,560
maybe drive across the country you know

472
00:16:53,990 --> 00:16:52,320
do other things so it's the same kind of

473
00:16:56,230 --> 00:16:54,000
thing here as engineers we take those

474
00:16:58,389 --> 00:16:56,240
basic requirements to do these multiple

475
00:17:00,230 --> 00:16:58,399
destinations these multiple locations

476
00:17:02,790 --> 00:17:00,240
and we're building a system that will

477
00:17:04,630 --> 00:17:02,800
allow us to go explore those we we no

478
00:17:06,710 --> 00:17:04,640
longer want to build a system that is

479
00:17:09,189 --> 00:17:06,720
optimized for one particular destination

480
00:17:11,270 --> 00:17:09,199
we want a system that can actually push

481
00:17:13,110 --> 00:17:11,280
human presence out into the solar system

482
00:17:15,270 --> 00:17:13,120
and allow us to go all these definite

483
00:17:16,949 --> 00:17:15,280
all these different destinations so what

484
00:17:18,470 --> 00:17:16,959
we've done is we've broken that down

485
00:17:20,630 --> 00:17:18,480
into the requirements that allow us to

486
00:17:22,630 --> 00:17:20,640
capture all these destinations scarred

487
00:17:24,630 --> 00:17:22,640
some interfaces to grow a little bit in

488
00:17:26,230 --> 00:17:24,640

the area so i think the teams are very

489
00:17:27,510 --> 00:17:26,240
comfortable with what we've we've laid

490
00:17:29,669 --> 00:17:27,520
out in front of them and they understand

491
00:17:32,549 --> 00:17:29,679
the requirements they need to build too

492
00:17:33,990 --> 00:17:32,559
yeah bill said great i'll just add so we

493
00:17:35,510 --> 00:17:34,000
this this vehicle has a lot of

494
00:17:36,710 --> 00:17:35,520
capability to do a lot of different

495
00:17:38,630 --> 00:17:36,720
missions you know when you talk about

496
00:17:39,750 --> 00:17:38,640
volume and delta v and

497
00:17:41,750 --> 00:17:39,760
um

498
00:17:43,990 --> 00:17:41,760
and ability to carry crew it's really

499
00:17:45,830 --> 00:17:44,000
got a lot of flexibility so we've also

500
00:17:47,430 --> 00:17:45,840
we participate in those architecture

501
00:17:49,350 --> 00:17:47,440
studies that happen at headquarters as

502
00:17:51,830 --> 00:17:49,360
they talk about new missions to make

503
00:17:53,750 --> 00:17:51,840
sure that we understand what what if any

504
00:17:55,110 --> 00:17:53,760
updates we would need to make but even

505
00:17:57,430 --> 00:17:55,120
at this point even with all those

506
00:17:59,190 --> 00:17:57,440
different discussions our plans for em1

507
00:18:02,870 --> 00:17:59,200
em2 haven't changed because this is a

508
00:18:06,470 --> 00:18:05,190
okay i don't see any other questions

509
00:18:07,990 --> 00:18:06,480
here in the room so we'll come back

510
00:18:09,830 --> 00:18:08,000
later for follow-ups but for now we'll

511
00:18:11,669 --> 00:18:09,840
go to our phone bridge

512
00:18:12,870 --> 00:18:11,679
we'll go in the order that you called

513
00:18:14,150 --> 00:18:12,880

and if you could be sure and address

514
00:18:15,750 --> 00:18:14,160
your question to the person who'd like

515
00:18:17,190 --> 00:18:15,760
to answer it that would be helpful i

516
00:18:25,750 --> 00:18:17,200
will start with lisa grossman from new

517
00:18:34,070 --> 00:18:27,350
lisa you may need to take your phone off

518
00:18:44,310 --> 00:18:35,029
okay

519
00:18:47,750 --> 00:18:45,909
hello this is lisa from new scientists

520
00:18:49,750 --> 00:18:47,760
are you still there did i miss it yes

521
00:18:51,270 --> 00:18:49,760
yes go ahead lisa okay great um i was

522
00:18:53,270 --> 00:18:51,280
wondering if you could lay out a little

523
00:18:54,950 --> 00:18:53,280
bit more clearly which parts of the

524
00:18:56,390 --> 00:18:54,960
vehicle are going to be nasa-based and

525
00:18:59,510 --> 00:18:56,400
which you're going to be issa based and

526
00:19:04,390 --> 00:19:02,070
sure um can you see the graphic where

527
00:19:06,150 --> 00:19:04,400
you are yes okay good so i think they

528
00:19:07,669 --> 00:19:06,160
put up the right one there's a picture

529
00:19:09,590 --> 00:19:07,679
of it the

530
00:19:11,430 --> 00:19:09,600
uh and the stuff in gray if you look can

531
00:19:13,350 --> 00:19:11,440
we i had kind of had them gray it out so

532
00:19:14,470 --> 00:19:13,360
it was a little easier to delineate that

533
00:19:17,510 --> 00:19:14,480
is

534
00:19:19,990 --> 00:19:17,520
uh the nasa uh and lockheed built

535
00:19:21,350 --> 00:19:20,000
spacecraft pieces uh what you don't see

536
00:19:23,029 --> 00:19:21,360
on there is the launch abort system

537
00:19:24,630 --> 00:19:23,039
which is where obviously nasa is

538
00:19:26,470 --> 00:19:24,640

retaining as well

539
00:19:28,470 --> 00:19:26,480
but the gray parts which again are the

540
00:19:30,710 --> 00:19:28,480
command module and then really

541
00:19:32,549 --> 00:19:30,720
structural interface pieces the fairings

542
00:19:34,470 --> 00:19:32,559
this the spacecraft adapter to the

543
00:19:36,310 --> 00:19:34,480
launch vehicle and then that

544
00:19:37,029 --> 00:19:36,320
crew module adapter which interfaces

545
00:19:38,470 --> 00:19:37,039
with

546
00:19:40,710 --> 00:19:38,480
the heat shield and the crew module so

547
00:19:42,470 --> 00:19:40,720
the white part there

548
00:19:44,549 --> 00:19:42,480
again is the core piece and esa's

549
00:19:46,150 --> 00:19:44,559
providing that and as i said it has the

550
00:19:47,590 --> 00:19:46,160
solar rays you'll notice also in the

551
00:19:48,950 --> 00:19:47,600
pictures now the orion will look

552
00:19:50,870 --> 00:19:48,960
different it'll

553
00:19:52,789 --> 00:19:50,880
the arrays look a lot like an atv so i

554
00:19:54,310 --> 00:19:52,799
think that's a visual representation of

555
00:19:55,510 --> 00:19:54,320
this agreement and the changes that

556
00:19:57,029 --> 00:19:55,520
we're making

557
00:19:58,950 --> 00:19:57,039
the radiators are on that part of the

558
00:20:00,070 --> 00:19:58,960
spacecraft obviously the key propulsion

559
00:20:03,190 --> 00:20:00,080
elements

560
00:20:05,190 --> 00:20:03,200
there's storable consumables

561
00:20:08,549 --> 00:20:05,200
for the crew and so forth are in there

562
00:20:10,630 --> 00:20:08,559
so a lot of key elements

563
00:20:15,430 --> 00:20:10,640

that will be provided by eso

564
00:20:18,470 --> 00:20:16,710
and how is this different from what was

565
00:20:20,789 --> 00:20:18,480
being planned before

566
00:20:23,110 --> 00:20:20,799
before the entire element that was in

567
00:20:25,510 --> 00:20:23,120
white was a nasa lockheed

568
00:20:28,470 --> 00:20:25,520
uh element that would be provided

569
00:20:31,510 --> 00:20:28,480
so again this deal is for uh em1

570
00:20:33,510 --> 00:20:31,520
uh so for the first flight this white no

571
00:20:35,270 --> 00:20:33,520
highlighted area will be provided by esa

572
00:20:37,110 --> 00:20:35,280
in the past the entire vehicle was a

573
00:20:38,870 --> 00:20:37,120
nasa lockheed vehicle

574
00:20:40,390 --> 00:20:38,880
okay thank you

575
00:20:49,590 --> 00:20:40,400
okay now we'll go to brian from the

576
00:20:52,630 --> 00:20:51,350
okay i don't hear anything from brian

577
00:20:56,230 --> 00:20:52,640
now we'll uh

578
00:20:58,870 --> 00:20:56,240
move on to amy spittak from aviation

579
00:21:00,390 --> 00:20:58,880
week and everybody be sure and uh mute

580
00:21:03,590 --> 00:21:00,400
your phones after you've finished asking

581
00:21:09,590 --> 00:21:07,350
hi um my question is um i guess for mr

582
00:21:12,070 --> 00:21:09,600
christian meyer or mr guyer

583
00:21:14,549 --> 00:21:12,080
will development of the module include

584
00:21:16,470 --> 00:21:14,559
flight ready spare hardware for missions

585
00:21:19,110 --> 00:21:16,480
beyond the 2017

586
00:21:21,430 --> 00:21:19,120
2017 flight and if so

587
00:21:23,510 --> 00:21:21,440
who is going to own that hardware

588
00:21:25,750 --> 00:21:23,520

and will european industry be involved

589
00:21:27,430 --> 00:21:25,760
in those missions even if it

590
00:21:30,230 --> 00:21:27,440
means additional costs or would

591
00:21:32,470 --> 00:21:30,240
production of the module stay in the u.s

592
00:21:33,909 --> 00:21:32,480
thank you

593
00:21:35,190 --> 00:21:33,919
the agreement

594
00:21:37,750 --> 00:21:35,200
includes this

595
00:21:40,070 --> 00:21:37,760
the highlighted area in white

596
00:21:42,149 --> 00:21:40,080
will be provided by issa that includes a

597
00:21:46,310 --> 00:21:42,159
sparing

598
00:21:48,789 --> 00:21:46,320
where you buy you know one of a certain

599
00:21:51,110 --> 00:21:48,799
set of items so that if something breaks

600
00:21:53,190 --> 00:21:51,120
in manufacturing or testing we have

601
00:21:56,630 --> 00:21:53,200
spares for that so it's

602
00:21:58,710 --> 00:21:56,640
that's the agreement um isa also agrees

603
00:22:00,390 --> 00:21:58,720
to support the sustaining engineering of

604
00:22:01,750 --> 00:22:00,400
that element so as we're doing testing

605
00:22:04,230 --> 00:22:01,760
or flying it that they'll have the

606
00:22:06,310 --> 00:22:04,240
expertise needed uh if we have questions

607
00:22:07,750 --> 00:22:06,320
of course it's a highly integrated

608
00:22:09,830 --> 00:22:07,760
vehicle

609
00:22:11,510 --> 00:22:09,840
none of these pieces fly by themselves

610
00:22:13,590 --> 00:22:11,520
in fact the cm and the sm don't fly by

611
00:22:15,270 --> 00:22:13,600
themselves other than the last few

612
00:22:17,590 --> 00:22:15,280
seconds after separation so it's a

613
00:22:20,630 --> 00:22:17,600

highly integrated vehicle we'll have

614
00:22:23,029 --> 00:22:20,640
uh will be tied to the hip for from now

615
00:22:24,950 --> 00:22:23,039
until uh through the flight with

616
00:22:27,669 --> 00:22:24,960
engineering and he says is supporting

617
00:22:30,070 --> 00:22:27,679
that in their plan

618
00:22:31,190 --> 00:22:30,080
and in terms of the kind of the future

619
00:22:33,029 --> 00:22:31,200
activities

620
00:22:35,029 --> 00:22:33,039
we really haven't really defined that at

621
00:22:37,909 --> 00:22:35,039
this point we've we've set up for the

622
00:22:40,710 --> 00:22:37,919
em1 mission as marx described we've got

623
00:22:42,230 --> 00:22:40,720
some spares key components for em-2

624
00:22:44,710 --> 00:22:42,240
we'll we'll see what we want to do with

625
00:22:46,950 --> 00:22:44,720
that mission and then beyond that

626
00:22:48,710 --> 00:22:46,960
we've protected both ways we've we've

627
00:22:50,789 --> 00:22:48,720
made sure that we've kept the right

628
00:22:53,510 --> 00:22:50,799
intellectual property that's available

629
00:22:55,669 --> 00:22:53,520
to us on the nasa u.s government side

630
00:22:57,510 --> 00:22:55,679
that we can manufacture the follow-on

631
00:22:59,669 --> 00:22:57,520
service modules

632
00:23:01,990 --> 00:22:59,679
if we need to on our side or if we

633
00:23:03,669 --> 00:23:02,000
decide that it's advantageous to us to

634
00:23:05,029 --> 00:23:03,679
continue in those future flights with

635
00:23:06,950 --> 00:23:05,039
the europeans we can work with the

636
00:23:08,950 --> 00:23:06,960
europeans to do that so we've really

637
00:23:10,950 --> 00:23:08,960
made no decisions about those future

638
00:23:13,909 --> 00:23:10,960

flights we think it's important to to

639
00:23:15,750 --> 00:23:13,919
set this up on the first flight and then

640
00:23:17,750 --> 00:23:15,760
plan kind of for that transition second

641
00:23:19,590 --> 00:23:17,760
flight and then beyond that we'll work

642
00:23:21,430 --> 00:23:19,600
together again as an international team

643
00:23:23,830 --> 00:23:21,440
and figure out what is the best thing

644
00:23:25,430 --> 00:23:23,840
for us in terms of human exploration and

645
00:23:28,470 --> 00:23:25,440
we'll figure out the way to do that as

646
00:23:33,190 --> 00:23:31,029
okay we'll go uh next to ken kramer with

647
00:23:36,390 --> 00:23:33,200
space flight magazine

648
00:23:39,190 --> 00:23:36,400
hi thanks for taking my question um

649
00:23:42,070 --> 00:23:39,200
i'm i guess i'm wondering about the uh

650
00:23:45,990 --> 00:23:42,080
the atv maybe for thomas writer uh

651
00:23:48,070 --> 00:23:46,000
if if how much of the em-2 um sm module

652
00:23:50,470 --> 00:23:48,080
would you build and i wonder if

653
00:23:52,549 --> 00:23:50,480
an esa astronaut might be aboard that

654
00:23:57,110 --> 00:23:52,559
flight which uh i think is going to go

655
00:23:59,029 --> 00:23:57,120
to the moon in 2021 or 2022.

656
00:24:01,830 --> 00:23:59,039
well thank you very much uh for this

657
00:24:04,149 --> 00:24:01,840
question as you can imagine i mean

658
00:24:06,390 --> 00:24:04,159
i addressed in my introductory remarks

659
00:24:08,310 --> 00:24:06,400
that this cooperation opens new

660
00:24:09,750 --> 00:24:08,320
perspectives for bringing humans beyond

661
00:24:12,070 --> 00:24:09,760
low earth orbit

662
00:24:13,029 --> 00:24:12,080
and certainly this is one of the areas

663
00:24:13,909 --> 00:24:13,039

where

664
00:24:55,350 --> 00:24:13,919
i

665
00:24:57,510 --> 00:24:55,360
the

666
00:25:00,390 --> 00:24:57,520
international space station but once

667
00:25:02,149 --> 00:25:00,400
again for the moment our focus is really

668
00:25:05,430 --> 00:25:02,159
on doing the technical the programmatic

669
00:25:09,990 --> 00:25:07,110
great thanks and maybe for bill

670
00:25:12,230 --> 00:25:10,000
gerstenmaier or or mark guyer are there

671
00:25:13,669 --> 00:25:12,240
any significant changes you have to make

672
00:25:16,230 --> 00:25:13,679
to the orion

673
00:25:19,830 --> 00:25:16,240
in order to integrate the uh

674
00:25:22,230 --> 00:25:19,840
the uh the european vehicle thanks

675
00:25:24,230 --> 00:25:22,240
yeah great question so the the

676
00:25:25,750 --> 00:25:24,240
we've worked really really well together

677
00:25:27,830 --> 00:25:25,760
as far as getting the requirements set

678
00:25:30,390 --> 00:25:27,840
up so we can minimize that and we want

679
00:25:32,710 --> 00:25:30,400
to make sure that the ryan performs uh

680
00:25:35,269 --> 00:25:32,720
as we've committed that'll perform so as

681
00:25:36,870 --> 00:25:35,279
far as his performance

682
00:25:38,149 --> 00:25:36,880
it'll be the same so that's great the

683
00:25:39,190 --> 00:25:38,159
team's done a great job obviously

684
00:25:40,870 --> 00:25:39,200
there'll be some difference in the

685
00:25:41,669 --> 00:25:40,880
structural interface if you look at

686
00:25:44,789 --> 00:25:41,679
where

687
00:25:46,789 --> 00:25:44,799
the highlighted white area now

688
00:25:47,909 --> 00:25:46,799

interfaces with that crew module adapter

689
00:25:49,590 --> 00:25:47,919
those

690
00:25:51,669 --> 00:25:49,600
on the locky design were one one

691
00:25:53,350 --> 00:25:51,679
structural piece so there'll be some

692
00:25:55,029 --> 00:25:53,360
difference as we figure out as we work

693
00:25:56,549 --> 00:25:55,039
together on how to attach those pieces

694
00:25:58,070 --> 00:25:56,559
and esa provides it then we do this

695
00:25:59,190 --> 00:25:58,080
assembly but i'd say that's the major

696
00:26:00,950 --> 00:25:59,200
piece

697
00:26:03,430 --> 00:26:00,960
we've also updated

698
00:26:04,789 --> 00:26:03,440
some computer interfaces

699
00:26:07,029 --> 00:26:04,799
and yet we're going to use the same

700
00:26:09,269 --> 00:26:07,039
network interface protocol so that makes

701
00:26:11,269 --> 00:26:09,279
it a lot simpler for us to work together

702
00:26:15,430 --> 00:26:11,279
so i think the team's done a great job

703
00:26:18,950 --> 00:26:17,350
okay next up is marcia dunn with the

704
00:26:21,269 --> 00:26:18,960
associated press

705
00:26:23,669 --> 00:26:21,279
yes hi good morning this question is

706
00:26:26,630 --> 00:26:23,679
probably from mr gerstenmaier but i was

707
00:26:29,029 --> 00:26:26,640
hoping to get the latest details on what

708
00:26:30,549 --> 00:26:29,039
the exploration mission one and two will

709
00:26:32,470 --> 00:26:30,559
entail could you just give the latest

710
00:26:34,149 --> 00:26:32,480
rundown on that and i have a follow-up

711
00:26:37,110 --> 00:26:34,159
please

712
00:26:38,950 --> 00:26:37,120
yeah em1 and em-2 at this point

713
00:26:39,830 --> 00:26:38,960

you know we conceptually talk about them

714
00:26:42,230 --> 00:26:39,840
going

715
00:26:44,310 --> 00:26:42,240
to the vicinity of the moon

716
00:26:45,990 --> 00:26:44,320
and that's a pretty broad space and then

717
00:26:47,669 --> 00:26:46,000
we're still looking at what the details

718
00:26:49,350 --> 00:26:47,679
are of what we want to go really do with

719
00:26:51,430 --> 00:26:49,360
those missions are there any things that

720
00:26:53,830 --> 00:26:51,440
we want to do in those areas but it

721
00:26:56,230 --> 00:26:53,840
turns out for the initial

722
00:26:58,390 --> 00:26:56,240
sls configuration that's a very

723
00:27:00,710 --> 00:26:58,400
reachable space for us with the sls

724
00:27:02,789 --> 00:27:00,720
configuration so i would say at this

725
00:27:05,269 --> 00:27:02,799
point we're looking to assist lunar

726
00:27:06,870 --> 00:27:05,279
space in the vicinity of the moon and

727
00:27:10,310 --> 00:27:06,880
we'll probably put some more details

728
00:27:12,070 --> 00:27:10,320
together as i described earlier

729
00:27:14,310 --> 00:27:12,080
thank you i'm wondering if you have a

730
00:27:15,510 --> 00:27:14,320
target day for the second mission and

731
00:27:18,310 --> 00:27:15,520
and the

732
00:27:21,190 --> 00:27:18,320
bigger picture question might be

733
00:27:23,990 --> 00:27:21,200
we hear about l2 outposts corralling an

734
00:27:27,510 --> 00:27:25,350
what's your preference what would you

735
00:27:30,230 --> 00:27:27,520
like to see the long-term

736
00:27:33,350 --> 00:27:30,240
or i guess short-term long-term plan for

737
00:27:35,909 --> 00:27:33,360
the orion and sls

738
00:27:39,029 --> 00:27:35,919

in terms of major flight uh milestones

739
00:27:40,870 --> 00:27:39,039
we have the 2014 exploration flight test

740
00:27:42,310 --> 00:27:40,880
which will really

741
00:27:44,310 --> 00:27:42,320
be the kind of the first flight of the

742
00:27:46,230 --> 00:27:44,320
major orion systems and also really

743
00:27:48,149 --> 00:27:46,240
stress the heat shield as as we look at

744
00:27:50,230 --> 00:27:48,159
re-entry

745
00:27:52,310 --> 00:27:50,240
heating of that capsule at about 80

746
00:27:53,909 --> 00:27:52,320
percent of the lunar velocity return

747
00:27:56,389 --> 00:27:53,919
kind of speeds that that will inform the

748
00:27:59,350 --> 00:27:56,399
critical design review for orion

749
00:28:01,830 --> 00:27:59,360
then we have the e-m1 mission in 2017 i

750
00:28:04,070 --> 00:28:01,840
mean late 2017 and then we have the

751
00:28:06,070 --> 00:28:04,080
first crude mission of the orion sls

752
00:28:07,750 --> 00:28:06,080
system in 2021

753
00:28:10,149 --> 00:28:07,760
and those are the the basic missions

754
00:28:12,789 --> 00:28:10,159
that we've laid out and in terms of my

755
00:28:13,750 --> 00:28:12,799
own personal preference i really don't

756
00:28:15,269 --> 00:28:13,760
have one

757
00:28:16,630 --> 00:28:15,279
what we're doing is we're really looking

758
00:28:18,310 --> 00:28:16,640
at all these different options that

759
00:28:19,990 --> 00:28:18,320
you've described and you've you know

760
00:28:21,830 --> 00:28:20,000
you've written about

761
00:28:23,430 --> 00:28:21,840
we'll take a look at all those we'll try

762
00:28:25,350 --> 00:28:23,440
to figure out which one is the best one

763
00:28:27,190 --> 00:28:25,360

to go do and when we figure out that

764
00:28:29,510 --> 00:28:27,200
it's the best one to go do and by best

765
00:28:32,549 --> 00:28:29,520
that's in the eyes of a whole variety of

766
00:28:34,630 --> 00:28:32,559
different stake stakeholders of which i

767
00:28:36,230 --> 00:28:34,640
try not to take an opinion i lay out the

768
00:28:38,710 --> 00:28:36,240
data and we let them decide then

769
00:28:40,870 --> 00:28:38,720
therefore i'm not disappointed so i

770
00:28:42,870 --> 00:28:40,880
won't pick i won't take a position but i

771
00:28:44,389 --> 00:28:42,880
i'm excited about getting beyond low

772
00:28:45,830 --> 00:28:44,399
earth orbit i'm excited

773
00:28:46,710 --> 00:28:45,840
about getting to the vicinity of the

774
00:28:48,710 --> 00:28:46,720
moon

775
00:28:50,950 --> 00:28:48,720
we really have a lot to learn

776
00:28:53,590 --> 00:28:50,960
you know we we went to the moon with

777
00:28:55,430 --> 00:28:53,600
apollo we went in very focused missions

778
00:28:57,990 --> 00:28:55,440
we didn't really spend a lot of time

779
00:29:00,389 --> 00:28:58,000
looking at what it really takes to do

780
00:29:02,230 --> 00:29:00,399
operations in deep space we're very

781
00:29:03,510 --> 00:29:02,240
comfortable now at least in low earth

782
00:29:05,430 --> 00:29:03,520
orbit with the international space

783
00:29:07,590 --> 00:29:05,440
station we've had crews on orbit

784
00:29:09,510 --> 00:29:07,600
continuously for about 12 years we

785
00:29:11,830 --> 00:29:09,520
understand stable orbit rendezvous we

786
00:29:13,590 --> 00:29:11,840
understand navigation in low earth orbit

787
00:29:15,830 --> 00:29:13,600
there's a lot to be learned in deep

788
00:29:17,990 --> 00:29:15,840

space and how do we protect our crews

789
00:29:19,830 --> 00:29:18,000
how do we look at return trajectories

790
00:29:22,549 --> 00:29:19,840
how do we look at

791
00:29:23,750 --> 00:29:22,559
redundancy in systems you know orion's

792
00:29:26,070 --> 00:29:23,760
designed

793
00:29:27,830 --> 00:29:26,080
to have some leak in the capsule and

794
00:29:30,310 --> 00:29:27,840
still return safely from the moon that's

795
00:29:32,149 --> 00:29:30,320
a tremendous design feature how do we

796
00:29:34,070 --> 00:29:32,159
exploit those features and move forward

797
00:29:36,230 --> 00:29:34,080
so i think again we have lots of things

798
00:29:38,470 --> 00:29:36,240
to discuss we'll we'll make those known

799
00:29:40,389 --> 00:29:38,480
as soon as we can let them know

800
00:29:42,149 --> 00:29:40,399
they make sense to tell us that that's

801
00:29:43,590 --> 00:29:42,159
what we want to go do but for now i

802
00:29:45,110 --> 00:29:43,600
think it's best we kind of look at all

803
00:29:47,350 --> 00:29:45,120
those and look at the advantages and

804
00:29:50,789 --> 00:29:47,360
which one allows us to move further and

805
00:29:52,789 --> 00:29:50,799
faster into exploration and deep space

806
00:29:54,789 --> 00:29:52,799
thank you

807
00:29:57,269 --> 00:29:54,799
okay next we'll go to dan leone with

808
00:29:59,510 --> 00:29:57,279
space news

809
00:30:02,070 --> 00:29:59,520
hi everybody thanks for having us i've

810
00:30:04,789 --> 00:30:02,080
got one for mr gerstenmaier one for mr

811
00:30:08,549 --> 00:30:04,799
ryder uh i'll start with the one for

812
00:30:12,470 --> 00:30:08,559
bill uh is there going to be any esa

813
00:30:14,950 --> 00:30:12,480

hardware on the eft-1 flight next year

814
00:30:16,789 --> 00:30:14,960
and then separately mr ryder since

815
00:30:18,870 --> 00:30:16,799
you're over on this side of the pond

816
00:30:21,190 --> 00:30:18,880
this week does this deal have any

817
00:30:23,590 --> 00:30:21,200
implications for a possible common crew

818
00:30:25,909 --> 00:30:23,600
exploration vehicle that esa's talked

819
00:30:28,389 --> 00:30:25,919
about before

820
00:30:30,230 --> 00:30:28,399
okay first of all on eft one i'll have

821
00:30:32,230 --> 00:30:30,240
to ask mark i don't believe there's any

822
00:30:34,710 --> 00:30:32,240
issa hardware on eft one but mark can

823
00:30:36,630 --> 00:30:34,720
confirm that no there's not it again

824
00:30:38,710 --> 00:30:36,640
we're uh really that flight is all

825
00:30:40,389 --> 00:30:38,720
really about the crew module

826
00:30:42,549 --> 00:30:40,399
and about key separation events so we'll

827
00:30:44,389 --> 00:30:42,559
do a launch abort system sep and the

828
00:30:45,909 --> 00:30:44,399
fairings will also separate so it's

829
00:30:48,789 --> 00:30:45,919
really the rest of it is all about the

830
00:30:50,549 --> 00:30:48,799
crew module so it's a there is this esa

831
00:30:53,190 --> 00:30:50,559
hardware is now flying on that flight

832
00:30:56,789 --> 00:30:53,200
this esa hardware helps us get em1 or we

833
00:30:58,950 --> 00:30:56,799
need a fully capable service module

834
00:31:00,950 --> 00:30:58,960
okay so to answer to your question uh

835
00:31:04,310 --> 00:31:00,960
related to kind of common crew

836
00:31:06,950 --> 00:31:04,320
exploration vehicle no this is now

837
00:31:09,750 --> 00:31:06,960
the focus from an is our side let me

838
00:31:12,789 --> 00:31:09,760

address in this context that

839
00:31:14,389 --> 00:31:12,799
our director general has decided or

840
00:31:16,470 --> 00:31:14,399
decided on on

841
00:31:19,430 --> 00:31:16,480
three strategic destinations those are

842
00:31:21,669 --> 00:31:19,440
low earth orbit represented of course by

843
00:31:24,630 --> 00:31:21,679
the international space station moon

844
00:31:26,789 --> 00:31:24,640
mars for the moment robotic exploration

845
00:31:29,430 --> 00:31:26,799
but of course with the ultimate goal of

846
00:31:33,909 --> 00:31:29,440
human exploration in the past yes we

847
00:31:35,830 --> 00:31:33,919
have been doing various studies in

848
00:31:37,750 --> 00:31:35,840
the direction of supporting or

849
00:31:40,870 --> 00:31:37,760
complementing

850
00:31:42,310 --> 00:31:40,880
exploration activities with european

851
00:31:45,509 --> 00:31:42,320
infrastructure

852
00:31:49,509 --> 00:31:45,519
making use of the ariane 5 making use of

853
00:31:52,310 --> 00:31:49,519
the atv however this is now where all

854
00:31:54,870 --> 00:31:52,320
these activities are basically convening

855
00:31:55,669 --> 00:31:54,880
in this corporation in mpcv

856
00:31:59,190 --> 00:31:55,679
now

857
00:32:00,470 --> 00:31:59,200
of course i think this is not the end of

858
00:32:03,909 --> 00:32:00,480
of the game

859
00:32:06,549 --> 00:32:03,919
this is the start of uh

860
00:32:09,430 --> 00:32:06,559
extended cooperation and of course we

861
00:32:10,230 --> 00:32:09,440
can imagine that in the further path we

862
00:32:12,870 --> 00:32:10,240
can

863
00:32:16,549 --> 00:32:12,880

expand on that but once again

864
00:32:19,509 --> 00:32:16,559
i think for the next years to 2017

865
00:32:21,509 --> 00:32:19,519
there's a lot of work ahead of us and i

866
00:32:25,029 --> 00:32:21,519
think this is what we

867
00:32:27,750 --> 00:32:25,039
at the moment will really focus on and

868
00:32:30,149 --> 00:32:27,760
the scenarios that will come then beyond

869
00:32:31,909 --> 00:32:30,159
i think your questions uh the other

870
00:32:34,230 --> 00:32:31,919
question that have already indicated

871
00:32:35,269 --> 00:32:34,240
what will will really be the destination

872
00:32:37,430 --> 00:32:35,279
then

873
00:32:39,669 --> 00:32:37,440
that will be solved as we go along at

874
00:32:41,590 --> 00:32:39,679
the moment i think it is important to

875
00:32:43,990 --> 00:32:41,600
point out that we find additional

876
00:32:46,789 --> 00:32:44,000
synergies that you build on expertise

877
00:32:49,669 --> 00:32:46,799
that is also available with the partners

878
00:32:52,710 --> 00:32:49,679
and that we have actually with this way

879
00:32:54,549 --> 00:32:52,720
a vehicle that has a certain operational

880
00:32:57,909 --> 00:32:54,559
flexibility in the sense of what

881
00:33:00,389 --> 00:32:57,919
destinations then will be chosen

882
00:33:02,549 --> 00:33:00,399
okay thank you everyone

883
00:33:05,110 --> 00:33:02,559
okay next is stephen clark with space

884
00:33:09,750 --> 00:33:08,950
i think so uh just a couple of questions

885
00:33:13,110 --> 00:33:09,760
and

886
00:33:15,269 --> 00:33:13,120
first of all uh for mark guyer maybe um

887
00:33:17,750 --> 00:33:15,279
who whose responsibility is the engine

888
00:33:19,430 --> 00:33:17,760

for the uh service module is that

889
00:33:20,389 --> 00:33:19,440
uh nasa responsibility and what type of

890
00:33:21,590 --> 00:33:20,399
engine would that be and have a

891
00:33:24,789 --> 00:33:21,600
follow-up

892
00:33:25,909 --> 00:33:24,799
yeah good question um the main engine

893
00:33:27,990 --> 00:33:25,919
we're going to use the ohms from the

894
00:33:30,310 --> 00:33:28,000
shuttle we have those left over from the

895
00:33:31,590 --> 00:33:30,320
shuttle we were going to do that

896
00:33:33,990 --> 00:33:31,600
the nasa side was going to do that

897
00:33:35,830 --> 00:33:34,000
anyway and so now that we made this deal

898
00:33:37,269 --> 00:33:35,840
it made a lot of sense given that we had

899
00:33:38,950 --> 00:33:37,279
an engine that had this performance and

900
00:33:40,470 --> 00:33:38,960
capability to

901
00:33:42,630 --> 00:33:40,480
make it part of this agreement so we'll

902
00:33:43,669 --> 00:33:42,640
provide the ohms engine 2 esa and

903
00:33:46,310 --> 00:33:43,679
they'll integrate it into their

904
00:33:49,430 --> 00:33:46,320
propulsion system

905
00:33:51,029 --> 00:33:49,440
and follow up to you mark

906
00:33:53,669 --> 00:33:51,039
did you walk through some of the some of

907
00:33:55,110 --> 00:33:53,679
the milestones this year for the orion

908
00:33:57,590 --> 00:33:55,120
51

909
00:34:00,149 --> 00:33:57,600
uh testing uh kfc

910
00:34:01,830 --> 00:34:00,159
and uh also we discussed the uh the

911
00:34:03,110 --> 00:34:01,840
cracks that were found in that bulkhead

912
00:34:04,870 --> 00:34:03,120
have those been

913
00:34:07,350 --> 00:34:04,880

repaired and what was the cause of that

914
00:34:09,270 --> 00:34:07,360
force good okay yeah a lot of key

915
00:34:11,030 --> 00:34:09,280
milestones so we've got a

916
00:34:12,950 --> 00:34:11,040
um

917
00:34:14,950 --> 00:34:12,960
loads test where we'll actually

918
00:34:16,470 --> 00:34:14,960
pressurize the element and then apply

919
00:34:17,909 --> 00:34:16,480
load to the outside of the structure to

920
00:34:19,589 --> 00:34:17,919
make sure the structure

921
00:34:21,190 --> 00:34:19,599
we're getting the response as we expect

922
00:34:22,710 --> 00:34:21,200
before we put all the hardware on board

923
00:34:24,230 --> 00:34:22,720
that'll probably be in the middle of

924
00:34:25,430 --> 00:34:24,240
february this year

925
00:34:27,270 --> 00:34:25,440
we're doing

926
00:34:29,829 --> 00:34:27,280
avionics testing in denver we'll run

927
00:34:31,349 --> 00:34:29,839
through the next version of the software

928
00:34:32,550 --> 00:34:31,359
here in the spring

929
00:34:34,950 --> 00:34:32,560
that's key because we're actually

930
00:34:35,990 --> 00:34:34,960
testing the power on and functional

931
00:34:37,669 --> 00:34:36,000
testing

932
00:34:39,510 --> 00:34:37,679
of the software in our lab in denver

933
00:34:41,270 --> 00:34:39,520
before we actually use it on the vehicle

934
00:34:42,790 --> 00:34:41,280
in the onc and kennedy so that'll be in

935
00:34:44,470 --> 00:34:42,800
the spring of this year

936
00:34:46,950 --> 00:34:44,480
in the summer this year we'll actually

937
00:34:48,470 --> 00:34:46,960
power on the avionics in the crew module

938
00:34:49,750 --> 00:34:48,480

and we'll and we'll deliver the heat

939
00:34:51,510 --> 00:34:49,760
shield itself

940
00:34:53,190 --> 00:34:51,520
so those are big milestones and then

941
00:34:55,750 --> 00:34:53,200
toward the end of this year

942
00:34:57,829 --> 00:34:55,760
we'll actually finish uh and get ready

943
00:35:00,230 --> 00:34:57,839
to deliver the element uh to the launch

944
00:35:01,109 --> 00:35:00,240
vehicle folks so a ton going on this

945
00:35:04,390 --> 00:35:01,119
year

946
00:35:07,109 --> 00:35:04,400
um across the country uh in different

947
00:35:09,270 --> 00:35:07,119
subcontractors and and uh

948
00:35:10,630 --> 00:35:09,280
pieces of lockheed and nasa across the

949
00:35:12,150 --> 00:35:10,640
country so it's a huge amount of work

950
00:35:14,470 --> 00:35:12,160
this year

951
00:35:15,829 --> 00:35:14,480
uh yeah as far as the cracks go they you

952
00:35:17,510 --> 00:35:15,839
know in the

953
00:35:19,670 --> 00:35:17,520
it's a um

954
00:35:21,510 --> 00:35:19,680
very complex primary structure because

955
00:35:23,270 --> 00:35:21,520
it it sees a lot of different driving

956
00:35:25,510 --> 00:35:23,280
loads whether it's a landing load a

957
00:35:27,670 --> 00:35:25,520
pressure load an abort load so it's a

958
00:35:29,910 --> 00:35:27,680
complex design the team's done a

959
00:35:31,670 --> 00:35:29,920
fantastic job

960
00:35:33,670 --> 00:35:31,680
given that it turns out that there was

961
00:35:35,430 --> 00:35:33,680
an area in the crew module where we

962
00:35:37,670 --> 00:35:35,440
underestimated some things like

963
00:35:40,950 --> 00:35:37,680

shrinkage of the weld

964
00:35:42,790 --> 00:35:40,960
and behavior some of the materials

965
00:35:45,589 --> 00:35:42,800
and so in that case we didn't realize we

966
00:35:48,710 --> 00:35:45,599
had a we were closer to the margins than

967
00:35:50,310 --> 00:35:48,720
we expected in one area on the vehicle

968
00:35:51,829 --> 00:35:50,320
of course we had cracks that were maybe

969
00:35:53,990 --> 00:35:51,839
i don't know half an inch big they never

970
00:35:55,990 --> 00:35:54,000
penetrated the pressure vessel but you

971
00:35:57,829 --> 00:35:56,000
don't want cracks and that's why you do

972
00:36:00,069 --> 00:35:57,839
the test

973
00:36:02,950 --> 00:36:00,079
we've come up with a great plan

974
00:36:04,790 --> 00:36:02,960
to basically bridge over those cracks uh

975
00:36:06,550 --> 00:36:04,800
to distribute the load

976
00:36:08,630 --> 00:36:06,560
um so that we won't see any issues on

977
00:36:10,630 --> 00:36:08,640
orbit as bill bill called them dustpan

978
00:36:12,550 --> 00:36:10,640
there it's a doubler so it's basically a

979
00:36:13,750 --> 00:36:12,560
piece of metal that kind of looks like a

980
00:36:15,670 --> 00:36:13,760
fan

981
00:36:17,510 --> 00:36:15,680
there may be two of them to distribute

982
00:36:19,589 --> 00:36:17,520
the load to a bigger area we'll

983
00:36:20,710 --> 00:36:19,599
basically bolt those onto the aft

984
00:36:21,829 --> 00:36:20,720
bulkhead

985
00:36:23,190 --> 00:36:21,839
inside

986
00:36:24,470 --> 00:36:23,200
and it'll distribute the load and then

987
00:36:26,069 --> 00:36:24,480
we'll be able to do the load test we

988
00:36:27,670 --> 00:36:26,079

have the design we're finalizing the

989
00:36:29,589 --> 00:36:27,680
analysis now

990
00:36:30,390 --> 00:36:29,599
to make sure we're not making stress

991
00:36:32,310 --> 00:36:30,400
load

992
00:36:33,670 --> 00:36:32,320
worse in other areas as we bolt this

993
00:36:37,109 --> 00:36:33,680
thing down that's normal when you do a

994
00:36:39,430 --> 00:36:37,119
doubler on aircraft or spacecraft

995
00:36:41,109 --> 00:36:39,440
that work will fit in within that loads

996
00:36:42,470 --> 00:36:41,119
test i described because we have a lot

997
00:36:43,990 --> 00:36:42,480
of other work to get ready for the load

998
00:36:45,750 --> 00:36:44,000
test a lot of the hardware to install

999
00:36:46,790 --> 00:36:45,760
that is going on in parallel while we

1000
00:36:47,990 --> 00:36:46,800
work this

1001
00:36:50,310 --> 00:36:48,000
uh crack

1002
00:36:52,150 --> 00:36:50,320
repair design so like i said we'll have

1003
00:36:54,630 --> 00:36:52,160
that ready to go before we do the loads

1004
00:36:56,230 --> 00:36:54,640
test in the middle of february

1005
00:36:57,589 --> 00:36:56,240
and we and when in the load steps as i

1006
00:36:58,870 --> 00:36:57,599
said before we will pressurize the

1007
00:37:01,030 --> 00:36:58,880
elements so we'll test it again we'll

1008
00:37:02,470 --> 00:37:01,040
make sure that the repair is good

1009
00:37:04,310 --> 00:37:02,480
along with doing the rest of the test of

1010
00:37:08,150 --> 00:37:04,320
the load test so

1011
00:37:12,950 --> 00:37:08,160
yeah good question a lot going on

1012
00:37:16,390 --> 00:37:14,470
good afternoon gentlemen

1013
00:37:18,630 --> 00:37:16,400

i think my question is for uh

1014
00:37:21,190 --> 00:37:18,640
uh william grissomeyer and mark guy at

1015
00:37:23,190 --> 00:37:21,200
least to start first did i understand

1016
00:37:25,990 --> 00:37:23,200
you just say that uh

1017
00:37:28,150 --> 00:37:26,000
the iga had already been signed with isa

1018
00:37:30,710 --> 00:37:28,160
if i understood what happened at the esa

1019
00:37:32,390 --> 00:37:30,720
council in november the agency only

1020
00:37:33,589 --> 00:37:32,400
committed to the station for the next

1021
00:37:35,430 --> 00:37:33,599
couple of years

1022
00:37:37,510 --> 00:37:35,440
and only a little over half of the

1023
00:37:39,349 --> 00:37:37,520
funding they need for the

1024
00:37:40,630 --> 00:37:39,359
service module

1025
00:37:43,910 --> 00:37:40,640
so maybe you could give us a

1026
00:37:46,150 --> 00:37:43,920
clarification of the status there

1027
00:37:48,390 --> 00:37:46,160
in terms of the service module agreement

1028
00:37:50,150 --> 00:37:48,400
there's an implementing agreement and

1029
00:37:53,109 --> 00:37:50,160
that that has been signed by both

1030
00:37:54,950 --> 00:37:53,119
parties both by by nasa and concurred on

1031
00:37:56,950 --> 00:37:54,960
by the appropriate government agency so

1032
00:37:59,109 --> 00:37:56,960
that's in place and that sets us up to

1033
00:38:01,190 --> 00:37:59,119
go do all this technical work and all

1034
00:38:04,550 --> 00:38:01,200
this activities that we described going

1035
00:38:07,270 --> 00:38:05,910
okay there's a concern for you that

1036
00:38:08,390 --> 00:38:07,280
they've only approved a little more than

1037
00:38:12,630 --> 00:38:08,400
half the money they need for this

1038
00:38:15,990 --> 00:38:14,390

i don't know thomas can address that i

1039
00:38:18,150 --> 00:38:16,000
mean

1040
00:38:21,430 --> 00:38:18,160
we'll let thomas talk in india then

1041
00:38:23,910 --> 00:38:21,440
we'll see i think this is the normal

1042
00:38:27,109 --> 00:38:23,920
process in asa we have

1043
00:38:30,390 --> 00:38:27,119
clearly made with a decision on

1044
00:38:33,030 --> 00:38:30,400
embarking on this post atv5 barter

1045
00:38:35,829 --> 00:38:33,040
element a commitment to support station

1046
00:38:36,870 --> 00:38:35,839
operations till 2020.

1047
00:38:37,670 --> 00:38:36,880
now

1048
00:38:40,470 --> 00:38:37,680
as

1049
00:38:43,270 --> 00:38:40,480
in other agencies i think the

1050
00:38:45,589 --> 00:38:43,280
commitments for the respective funds are

1051
00:38:47,589 --> 00:38:45,599
distributed over time and for the moment

1052
00:38:49,589 --> 00:38:47,599
this is the first part that has been

1053
00:38:51,670 --> 00:38:49,599
committed in the past

1054
00:38:54,310 --> 00:38:51,680
ministerial in

1055
00:38:58,310 --> 00:38:54,320
november last year and the next part

1056
00:39:01,109 --> 00:38:58,320
will be then decided upon in 2014. so

1057
00:39:04,310 --> 00:39:01,119
i think this is just the normal

1058
00:39:07,670 --> 00:39:04,320
way how asa is deciding on its budgets

1059
00:39:10,950 --> 00:39:07,680
for uh not only iss exploitation not

1060
00:39:14,230 --> 00:39:10,960
only for mpc but for all programs

1061
00:39:16,230 --> 00:39:14,240
and i think in that respect there is a

1062
00:39:17,829 --> 00:39:16,240
clear path forward and there is a clear

1063
00:39:21,030 --> 00:39:17,839

commitment

1064
00:39:28,550 --> 00:39:21,040
on a really basic programmatic ground

1065
00:39:41,349 --> 00:39:29,589
next we're going to go to clara

1066
00:39:50,150 --> 00:39:42,790
and clara if you haven't unmuted your

1067
00:39:54,150 --> 00:39:51,750
okay we'll try instead

1068
00:39:55,510 --> 00:39:54,160
bill harwood with cbs

1069
00:39:57,190 --> 00:39:55,520
thank you very much and this is just a

1070
00:39:58,790 --> 00:39:57,200
follow-up on peter's question uh for

1071
00:40:01,109 --> 00:39:58,800
those of us who don't track isis budget

1072
00:40:03,430 --> 00:40:01,119
as closely as we maybe track nasa's what

1073
00:40:05,030 --> 00:40:03,440
what cost figure should go on this the

1074
00:40:07,349 --> 00:40:05,040
current agreement if it's funded

1075
00:40:09,270 --> 00:40:07,359
throughout uh through the first flight

1076
00:40:10,470 --> 00:40:09,280
and and the components that are planned

1077
00:40:12,230 --> 00:40:10,480
for the second

1078
00:40:17,510 --> 00:40:12,240
what sort of money is is involved here

1079
00:40:20,150 --> 00:40:18,870
okay i

1080
00:40:22,710 --> 00:40:20,160
have to say i

1081
00:40:25,349 --> 00:40:22,720
at this point uh a little bit reluctant

1082
00:40:27,910 --> 00:40:25,359
to really talk about financial figures

1083
00:40:30,390 --> 00:40:27,920
it is about 60 percent that has been

1084
00:40:33,829 --> 00:40:30,400
committed now for the first part

1085
00:40:37,430 --> 00:40:33,839
until 2014 the second

1086
00:40:40,630 --> 00:40:37,440
share which is a smaller one of about 40

1087
00:40:41,589 --> 00:40:40,640
will be committed then in 2014

1088
00:40:43,589 --> 00:40:41,599

and

1089
00:40:45,510 --> 00:40:43,599
the overall value okay i think this

1090
00:40:48,069 --> 00:40:45,520
figure is known it has been published

1091
00:40:51,190 --> 00:40:48,079
before is in the order of 450 million

1092
00:40:54,550 --> 00:40:52,550
thank you

1093
00:40:58,069 --> 00:40:54,560
okay and uh last on the list we have jim

1094
00:41:03,990 --> 00:41:01,670
uh yes thank you uh for letting us uh uh

1095
00:41:06,470 --> 00:41:04,000
talk to you all this question is for mr

1096
00:41:07,430 --> 00:41:06,480
uh ghost in mind mr dyer

1097
00:41:11,190 --> 00:41:07,440
there's been

1098
00:41:13,270 --> 00:41:11,200
over massed

1099
00:41:15,670 --> 00:41:13,280
what is nasa thinking about doing to

1100
00:41:17,750 --> 00:41:15,680
handle some of those uh issues

1101
00:41:19,510 --> 00:41:17,760
and does nasa see any problems with

1102
00:41:21,829 --> 00:41:19,520
reaching the goal of

1103
00:41:23,190 --> 00:41:21,839
i believe i read that it was 4 000

1104
00:41:26,550 --> 00:41:23,200
pounds over

1105
00:41:28,230 --> 00:41:26,560
over what the parachutes can handle

1106
00:41:30,230 --> 00:41:28,240
yeah great question the

1107
00:41:33,750 --> 00:41:30,240
um

1108
00:41:35,430 --> 00:41:33,760
what that really is is you take my

1109
00:41:37,510 --> 00:41:35,440
unmanned flight test article that we're

1110
00:41:39,910 --> 00:41:37,520
going to fly in 20 months and if you

1111
00:41:41,430 --> 00:41:39,920
then add all the crew and all the

1112
00:41:43,829 --> 00:41:41,440
systems

1113
00:41:45,829 --> 00:41:43,839

uh that you would need to fly on em-2

1114
00:41:47,829 --> 00:41:45,839
then you add that all up and yeah and

1115
00:41:49,750 --> 00:41:47,839
we're in that the crew module itself is

1116
00:41:51,109 --> 00:41:49,760
in that 4 000 pound range that we've got

1117
00:41:53,910 --> 00:41:51,119
to reduce

1118
00:41:56,309 --> 00:41:53,920
but but we're not flying em to tomorrow

1119
00:41:59,750 --> 00:41:56,319
we have a plan today

1120
00:42:01,349 --> 00:41:59,760
to get to an em-208 that that will meet

1121
00:42:03,510 --> 00:42:01,359
the parachute requirements and also meet

1122
00:42:06,230 --> 00:42:03,520
the

1123
00:42:08,790 --> 00:42:06,240
mass requirements that allow us to meet

1124
00:42:09,829 --> 00:42:08,800
our objectives on em1 and emt in other

1125
00:42:11,589 --> 00:42:09,839
words you have to be light enough that

1126
00:42:13,109 --> 00:42:11,599
the engines can push you

1127
00:42:14,870 --> 00:42:13,119
and get to the places you want to get to

1128
00:42:17,510 --> 00:42:14,880
so we have those targets

1129
00:42:19,109 --> 00:42:17,520
from from dan dunbacher who of course is

1130
00:42:22,230 --> 00:42:19,119
my boss at headquarters and actually

1131
00:42:23,750 --> 00:42:22,240
owns this integrated sls orion we have

1132
00:42:27,270 --> 00:42:23,760
those targets

1133
00:42:28,950 --> 00:42:27,280
that the lockheed nasa team have already

1134
00:42:30,550 --> 00:42:28,960
allocated those targets to the different

1135
00:42:33,030 --> 00:42:30,560
systems that we know need to get lighter

1136
00:42:34,870 --> 00:42:33,040
before we fly em-2

1137
00:42:37,270 --> 00:42:34,880
and we also had a lot of

1138
00:42:38,470 --> 00:42:37,280

a bunch of work even as soon as the last

1139
00:42:39,750 --> 00:42:38,480
couple of months and we had a big

1140
00:42:42,390 --> 00:42:39,760
meeting in december where we talked

1141
00:42:44,630 --> 00:42:42,400
about specific updates that we'll do for

1142
00:42:46,069 --> 00:42:44,640
em-2 including primary structure some

1143
00:42:47,589 --> 00:42:46,079
with the heat shield

1144
00:42:48,390 --> 00:42:47,599
and other areas of the vehicle that we

1145
00:42:50,069 --> 00:42:48,400
know

1146
00:42:51,430 --> 00:42:50,079
we can reduce the mass on and meet the

1147
00:42:53,670 --> 00:42:51,440
targets so

1148
00:42:56,390 --> 00:42:53,680
uh mass is going to be a challenge uh if

1149
00:42:59,750 --> 00:42:56,400
you remember on apollo and and and the

1150
00:43:01,750 --> 00:42:59,760
limb it was a big deal because any any

1151
00:43:03,910 --> 00:43:01,760
pound of mass you try to accelerate from

1152
00:43:05,829 --> 00:43:03,920
low earth orbit to the moon

1153
00:43:08,230 --> 00:43:05,839
and then get it home and land it you got

1154
00:43:09,990 --> 00:43:08,240
to multiply by nine all the systems that

1155
00:43:12,069 --> 00:43:10,000
have to support it in other words the

1156
00:43:13,750 --> 00:43:12,079
service module and then upper stage and

1157
00:43:15,829 --> 00:43:13,760
then the rock and everybody else that

1158
00:43:17,589 --> 00:43:15,839
has to push that mass so mass is is an

1159
00:43:19,510 --> 00:43:17,599
extreme premium

1160
00:43:20,630 --> 00:43:19,520
um it wasn't apollo it was a challenge

1161
00:43:22,710 --> 00:43:20,640
for them

1162
00:43:23,910 --> 00:43:22,720
we have plans to get to mtu but mass is

1163
00:43:25,190 --> 00:43:23,920

going to be something that we are going

1164
00:43:26,950 --> 00:43:25,200
to watch

1165
00:43:27,829 --> 00:43:26,960
every day and we're going to have to

1166
00:43:30,309 --> 00:43:27,839
have

1167
00:43:31,990 --> 00:43:30,319
options for reducing and all the way up

1168
00:43:33,829 --> 00:43:32,000
until we launch and remember an apollo

1169
00:43:35,030 --> 00:43:33,839
as they flew

1170
00:43:36,309 --> 00:43:35,040
they learned more and more about the

1171
00:43:37,990 --> 00:43:36,319
loads and environments they were seeing

1172
00:43:40,150 --> 00:43:38,000
and they were actually able to add

1173
00:43:41,430 --> 00:43:40,160
capability remember the first lunar

1174
00:43:43,910 --> 00:43:41,440
lander

1175
00:43:45,190 --> 00:43:43,920
i think apollo 9 that lamb could not

1176
00:43:46,870 --> 00:43:45,200
have actually landed on the moon and

1177
00:43:48,550 --> 00:43:46,880
done the mission but within two flights

1178
00:43:50,390 --> 00:43:48,560
they figured it out got the mass down

1179
00:43:51,910 --> 00:43:50,400
and by the end of flying apollo they

1180
00:43:54,950 --> 00:43:51,920
were actually flying buggies on these

1181
00:43:56,790 --> 00:43:54,960
landers so this is part of

1182
00:43:58,230 --> 00:43:56,800
why eft-1 is so important we're going to

1183
00:43:59,589 --> 00:43:58,240
we've got models

1184
00:44:02,150 --> 00:43:59,599
we've got a lot of experience we're

1185
00:44:03,670 --> 00:44:02,160
going to fly the crew module on eft-1

1186
00:44:04,790 --> 00:44:03,680
we're going to put it at 3000 miles

1187
00:44:06,230 --> 00:44:04,800
we're going to push it into the

1188
00:44:07,510 --> 00:44:06,240

atmosphere we're going to land it under

1189
00:44:09,910 --> 00:44:07,520
the shoots we're going to get a ton of

1190
00:44:11,109 --> 00:44:09,920
data about the loads we experience and

1191
00:44:13,670 --> 00:44:11,119
the environments we saw and that's going

1192
00:44:15,349 --> 00:44:13,680
to tell us a lot about where our margins

1193
00:44:16,550 --> 00:44:15,359
are on the vehicle that now we can

1194
00:44:18,150 --> 00:44:16,560
attack

1195
00:44:19,910 --> 00:44:18,160
and get ready for these manned missions

1196
00:44:21,030 --> 00:44:19,920
so we have a plan it's going to be

1197
00:44:24,230 --> 00:44:21,040
aggressive

1198
00:44:25,510 --> 00:44:24,240
going to be one of the key things we're

1199
00:44:27,510 --> 00:44:25,520
going to be watching all the way until

1200
00:44:29,510 --> 00:44:27,520
we fly people so

1201
00:44:31,109 --> 00:44:29,520
it's part it's part of the fun of

1202
00:44:34,230 --> 00:44:31,119
engineering making this happen right

1203
00:44:35,349 --> 00:44:34,240
it's not simple it's not a simple system

1204
00:44:36,950 --> 00:44:35,359
thank you

1205
00:44:39,430 --> 00:44:36,960
okay we'll try real quick again on the

1206
00:44:45,190 --> 00:44:39,440
two that we missed uh brian vastai from

1207
00:44:45,200 --> 00:44:51,510
okay or clara moskowitz from space.com

1208
00:44:54,390 --> 00:44:52,870
okay since we don't hear from either of

1209
00:44:57,109 --> 00:44:54,400
them we'll take any follow-up questions

1210
00:44:59,510 --> 00:44:57,119
here in the room starting with mark caro

1211
00:45:01,349 --> 00:44:59,520
uh thanks mark caro for aviation week

1212
00:45:04,470 --> 00:45:01,359
again and i think i'm asking for

1213
00:45:06,630 --> 00:45:04,480

clarification on a couple of things just

1214
00:45:08,470 --> 00:45:06,640
because i might be a little confused

1215
00:45:09,829 --> 00:45:08,480
i want to make sure i understand the the

1216
00:45:12,950 --> 00:45:09,839
hardware that's involved in this

1217
00:45:15,829 --> 00:45:12,960
agreement is for the

1218
00:45:18,630 --> 00:45:15,839
2017 flight and then

1219
00:45:19,430 --> 00:45:18,640
partial hardware for the next one

1220
00:45:24,550 --> 00:45:19,440
and

1221
00:45:26,390 --> 00:45:24,560
agreement where you're

1222
00:45:29,270 --> 00:45:26,400
working off of the space station in

1223
00:45:30,790 --> 00:45:29,280
order to do this and and whether this

1224
00:45:33,349 --> 00:45:30,800
agreement

1225
00:45:35,750 --> 00:45:33,359
accelerates any of the development for

1226
00:45:38,150 --> 00:45:35,760
orion in the service module

1227
00:45:40,309 --> 00:45:38,160
i'm just looking for some way to say

1228
00:45:44,309 --> 00:45:40,319
what each side is giving without

1229
00:45:49,190 --> 00:45:46,710
well i'll start with the what what is in

1230
00:45:51,430 --> 00:45:49,200
this current agreement which is again

1231
00:45:53,510 --> 00:45:51,440
for em1 and it's the systems in that

1232
00:45:54,870 --> 00:45:53,520
highlighted white area we are providing

1233
00:45:56,550 --> 00:45:54,880
some pieces

1234
00:45:57,349 --> 00:45:56,560
like the main engine

1235
00:45:59,270 --> 00:45:57,359
uh

1236
00:46:00,550 --> 00:45:59,280
some other propulsion hardware we're

1237
00:46:02,150 --> 00:46:00,560
actually providing and some network

1238
00:46:03,510 --> 00:46:02,160

cards so there's some cats and dogs that

1239
00:46:05,750 --> 00:46:03,520
we also provide

1240
00:46:06,550 --> 00:46:05,760
to close this deal but that's basically

1241
00:46:09,430 --> 00:46:06,560
it

1242
00:46:11,510 --> 00:46:09,440
isa does provide spares for em1 now if

1243
00:46:12,550 --> 00:46:11,520
we use them because sometimes you have a

1244
00:46:14,710 --> 00:46:12,560
spare sometimes because you break

1245
00:46:16,390 --> 00:46:14,720
something if we use them

1246
00:46:17,829 --> 00:46:16,400
we'll use them on e-m1 if we don't use

1247
00:46:20,309 --> 00:46:17,839
them that hardware can be applied to

1248
00:46:22,150 --> 00:46:20,319
em-2 so when bill's talking about spares

1249
00:46:23,349 --> 00:46:22,160
and beginning free m2 it can be those

1250
00:46:24,630 --> 00:46:23,359
things hopefully we won't break the

1251
00:46:26,950 --> 00:46:24,640
stuff and we'll have it available for

1252
00:46:29,750 --> 00:46:26,960
em-2 so that's the key

1253
00:46:31,829 --> 00:46:29,760
um to me that the the

1254
00:46:33,829 --> 00:46:31,839
the essential part of this is not

1255
00:46:35,190 --> 00:46:33,839
whether we accelerated something or not

1256
00:46:36,230 --> 00:46:35,200
it's actually

1257
00:46:37,589 --> 00:46:36,240
uh

1258
00:46:39,270 --> 00:46:37,599
initiating

1259
00:46:42,470 --> 00:46:39,280
international partnership beyond low

1260
00:46:45,030 --> 00:46:42,480
earth orbit that's really the key

1261
00:46:47,670 --> 00:46:45,040
certainly esa provides capability here

1262
00:46:50,069 --> 00:46:47,680
but we also now have some increased

1263
00:46:52,230 --> 00:46:50,079

integration you know because we're

1264
00:46:53,829 --> 00:46:52,240
separated

1265
00:46:55,589 --> 00:46:53,839
and so that's really what i'd say it's

1266
00:46:58,390 --> 00:46:55,599
not really accelerating stuff but back

1267
00:47:00,550 --> 00:46:58,400
basically initiating this new uh

1268
00:47:03,430 --> 00:47:00,560
exploration plan with uh

1269
00:47:05,670 --> 00:47:03,440
isa involved in this first flight

1270
00:47:07,750 --> 00:47:05,680
i think it's also important to note that

1271
00:47:10,069 --> 00:47:07,760
you know we're not reducing the lockheed

1272
00:47:11,910 --> 00:47:10,079
martin contract value it stays where it

1273
00:47:13,190 --> 00:47:11,920
is they'll have to actually do probably

1274
00:47:14,550 --> 00:47:13,200
some additional work that they hadn't

1275
00:47:15,990 --> 00:47:14,560
planned so they won't have to do this

1276
00:47:17,990 --> 00:47:16,000
service module work but they'll have to

1277
00:47:19,510 --> 00:47:18,000
do some integration work associated with

1278
00:47:22,069 --> 00:47:19,520
bringing this hardware together so there

1279
00:47:23,589 --> 00:47:22,079
will be some additional cost associated

1280
00:47:25,190 --> 00:47:23,599
with that but then there's some other

1281
00:47:26,790 --> 00:47:25,200
activities that were phased a little bit

1282
00:47:28,549 --> 00:47:26,800
later that lockheed was going to go do

1283
00:47:30,710 --> 00:47:28,559
that we'll make sure get done in this

1284
00:47:31,670 --> 00:47:30,720
earlier time frame so i'm not sure it

1285
00:47:32,950 --> 00:47:31,680
really

1286
00:47:34,549 --> 00:47:32,960
we got to be careful how we talk about

1287
00:47:36,390 --> 00:47:34,559
this i'm not sure it really saves us

1288
00:47:38,390 --> 00:47:36,400

money but what it does is i believe it

1289
00:47:40,549 --> 00:47:38,400
builds us a more robust development

1290
00:47:42,230 --> 00:47:40,559
schedule because it allows us to

1291
00:47:43,750 --> 00:47:42,240
essentially move some work that would

1292
00:47:45,750 --> 00:47:43,760
have been late and if we were to find a

1293
00:47:47,670 --> 00:47:45,760
problem in that work late then that's

1294
00:47:49,589 --> 00:47:47,680
tough to recover from to try to make a

1295
00:47:51,510 --> 00:47:49,599
particular launch date so it allows us

1296
00:47:53,670 --> 00:47:51,520
to kind of work smarter within the

1297
00:47:56,069 --> 00:47:53,680
contracts we have to make sure we're

1298
00:47:59,750 --> 00:47:56,079
going to get to those dates of 2017 and

1299
00:48:01,190 --> 00:47:59,760
the 2021 day with more robustness so so

1300
00:48:03,589 --> 00:48:01,200
we've got to be careful we shouldn't try

1301
00:48:05,109 --> 00:48:03,599
to go look at what esa's contributing

1302
00:48:06,870 --> 00:48:05,119
and then try to subtract that out of our

1303
00:48:09,270 --> 00:48:06,880
budget and say we're getting there we're

1304
00:48:12,069 --> 00:48:09,280
actually getting a better more robust

1305
00:48:14,549 --> 00:48:12,079
design by cooperating together so so the

1306
00:48:16,790 --> 00:48:14,559
the beauty of this is it it's helping

1307
00:48:17,990 --> 00:48:16,800
esa essentially

1308
00:48:20,230 --> 00:48:18,000
use that you know instead of just

1309
00:48:22,150 --> 00:48:20,240
building an atv that was dedicated

1310
00:48:24,150 --> 00:48:22,160
solely to space station they're now

1311
00:48:26,870 --> 00:48:24,160
getting a capability that can be used in

1312
00:48:28,470 --> 00:48:26,880
a variety of exploration activities into

1313
00:48:30,950 --> 00:48:28,480

the future and thomas can talk about

1314
00:48:32,870 --> 00:48:30,960
those so that's a big advantage to esa

1315
00:48:34,870 --> 00:48:32,880
the advantage to us is that it brings in

1316
00:48:37,910 --> 00:48:34,880
international

1317
00:48:39,589 --> 00:48:37,920
right at the beginning so then that

1318
00:48:40,950 --> 00:48:39,599
gives us a different flavor of what we

1319
00:48:42,309 --> 00:48:40,960
may do with some of these follow-on

1320
00:48:44,470 --> 00:48:42,319
missions some of the questions you were

1321
00:48:46,470 --> 00:48:44,480
trying to tease out earlier this gives

1322
00:48:48,470 --> 00:48:46,480
us a chance to experience some of that

1323
00:48:50,150 --> 00:48:48,480
early on and then make smarter decisions

1324
00:48:52,069 --> 00:48:50,160
and it also allows us to have a more

1325
00:48:54,950 --> 00:48:52,079
robust overall design to help us meet

1326
00:48:57,270 --> 00:48:54,960
our original commitments for em-1 so so

1327
00:48:59,750 --> 00:48:57,280
in a win this in a way this is a win-win

1328
00:49:01,510 --> 00:48:59,760
for both of us but it does

1329
00:49:03,510 --> 00:49:01,520
create a new interface that didn't exist

1330
00:49:05,430 --> 00:49:03,520
before and that interface has to be

1331
00:49:06,950 --> 00:49:05,440
carefully managed or you end up in you

1332
00:49:09,510 --> 00:49:06,960
negate all those good things i just

1333
00:49:13,670 --> 00:49:11,109
maybe some

1334
00:49:15,910 --> 00:49:13,680
very general remarks about bada

1335
00:49:17,910 --> 00:49:15,920
arrangements which so far have been a

1336
00:49:19,670 --> 00:49:17,920
very important element in this

1337
00:49:21,829 --> 00:49:19,680
international space station programs

1338
00:49:24,390 --> 00:49:21,839

things think about the nodes

1339
00:49:25,910 --> 00:49:24,400
that have been provided by some other

1340
00:49:27,990 --> 00:49:25,920
hardware that we have been bartering

1341
00:49:30,630 --> 00:49:28,000
either with nasa or also with our

1342
00:49:33,430 --> 00:49:30,640
russian partners so i think in general

1343
00:49:34,870 --> 00:49:33,440
as a kind of international cooperation

1344
00:49:36,950 --> 00:49:34,880
the barter

1345
00:49:38,549 --> 00:49:36,960
is is a very important element now

1346
00:49:40,870 --> 00:49:38,559
specifically

1347
00:49:42,950 --> 00:49:40,880
for atv

1348
00:49:46,069 --> 00:49:42,960
as you might recall in

1349
00:49:47,510 --> 00:49:46,079
in march 2011 the council the asa

1350
00:49:50,549 --> 00:49:47,520
council

1351
00:49:52,470 --> 00:49:50,559
decided upon not to continue with atv 6

1352
00:49:53,750 --> 00:49:52,480
and 7 but to

1353
00:49:56,870 --> 00:49:53,760
it would have been basically a

1354
00:49:58,710 --> 00:49:56,880
replication of the same where we are in

1355
00:50:01,510 --> 00:49:58,720
a phase where it actually would be

1356
00:50:04,390 --> 00:50:01,520
prudent really to do a redesign of major

1357
00:50:06,069 --> 00:50:04,400
system components or even move into

1358
00:50:07,829 --> 00:50:06,079
something new and that was exactly the

1359
00:50:10,710 --> 00:50:07,839
moment where we started the discussions

1360
00:50:12,950 --> 00:50:10,720
with nasa if we can

1361
00:50:16,230 --> 00:50:12,960
barter our common station operating

1362
00:50:18,470 --> 00:50:16,240
costs and other services in that way so

1363
00:50:20,710 --> 00:50:18,480

i think an excellent example where uh

1364
00:50:23,510 --> 00:50:20,720
really this spata was really beneficial

1365
00:50:25,589 --> 00:50:23,520
for both sides as bill just explained

1366
00:50:26,630 --> 00:50:25,599
from nasa perspective and from our side

1367
00:50:30,150 --> 00:50:26,640
really to

1368
00:50:33,910 --> 00:50:30,160
to use atv heritage to strategically of

1369
00:50:36,150 --> 00:50:33,920
course engage in a in a direction beyond

1370
00:50:38,150 --> 00:50:36,160
low earth orbit in exploration and

1371
00:50:40,950 --> 00:50:38,160
really to build on this on this

1372
00:50:46,630 --> 00:50:40,960
expertise which which

1373
00:50:50,790 --> 00:50:49,030
just if you could just clarify there i

1374
00:50:53,270 --> 00:50:50,800
wanted to make sure that i understood if

1375
00:50:55,829 --> 00:50:53,280
there was some

1376
00:50:58,230 --> 00:50:55,839
some contribution to the space station

1377
00:51:00,630 --> 00:50:58,240
that now shifts to this project or this

1378
00:51:04,549 --> 00:51:00,640
is sort of a

1379
00:51:07,589 --> 00:51:04,559
you know a new a new start as it were

1380
00:51:09,829 --> 00:51:07,599
what's intriguing is that the basic

1381
00:51:11,030 --> 00:51:09,839
framework of the space station

1382
00:51:12,870 --> 00:51:11,040
the folks that put together the

1383
00:51:14,870 --> 00:51:12,880
agreements at the very beginning it

1384
00:51:17,589 --> 00:51:14,880
actually says for space station or

1385
00:51:20,069 --> 00:51:17,599
exploration so what's what's really

1386
00:51:22,309 --> 00:51:20,079
amazing is whoever you know

1387
00:51:24,390 --> 00:51:22,319
negotiated and put together all those

1388
00:51:26,470 --> 00:51:24,400

fundamental agreements recognized that

1389
00:51:29,270 --> 00:51:26,480
station would be this first step going

1390
00:51:30,790 --> 00:51:29,280
forward so that gave us the ability to

1391
00:51:32,150 --> 00:51:30,800
go ahead and do what we've just done

1392
00:51:34,069 --> 00:51:32,160
through this implementing agreement we

1393
00:51:36,309 --> 00:51:34,079
had to formalize it in an implementing

1394
00:51:38,470 --> 00:51:36,319
agreement but the basic framework was

1395
00:51:41,510 --> 00:51:38,480
enabled by the basic documentation with

1396
00:51:44,150 --> 00:51:41,520
station so so you know we see this as an

1397
00:51:46,069 --> 00:51:44,160
advantage and it's really

1398
00:51:48,069 --> 00:51:46,079
this is really exploration so we talk

1399
00:51:50,870 --> 00:51:48,079
about station as being the first step in

1400
00:51:53,109 --> 00:51:50,880
exploration this is really

1401
00:51:54,870 --> 00:51:53,119
that evidence of that first step in

1402
00:51:56,950 --> 00:51:54,880
exploration not just the physical

1403
00:51:59,109 --> 00:51:56,960
hardware and understanding astronaut

1404
00:52:01,589 --> 00:51:59,119
health or long-duration microgravity

1405
00:52:03,030 --> 00:52:01,599
this is also showing how we can use

1406
00:52:04,470 --> 00:52:03,040
our understandings our working

1407
00:52:09,109 --> 00:52:04,480
relationships our contractor

1408
00:52:13,270 --> 00:52:11,109
okay and i think we also have a question

1409
00:52:14,309 --> 00:52:13,280
from the national nasa social media

1410
00:52:16,470 --> 00:52:14,319
online

1411
00:52:18,390 --> 00:52:16,480
yes we received a question from d

1412
00:52:20,710 --> 00:52:18,400
holzhauser on twitter

1413
00:52:23,430 --> 00:52:20,720

there doesn't appear to be any extended

1414
00:52:26,150 --> 00:52:23,440
hab capability are there any hooks to

1415
00:52:28,230 --> 00:52:26,160
add longer duration habitation

1416
00:52:29,829 --> 00:52:28,240
capability

1417
00:52:31,430 --> 00:52:29,839
yeah it and again what we've been

1418
00:52:34,150 --> 00:52:31,440
focused on here is we're building the

1419
00:52:35,829 --> 00:52:34,160
orion capsule and the sls vehicle and

1420
00:52:37,910 --> 00:52:35,839
then at some point if we're going to go

1421
00:52:39,829 --> 00:52:37,920
further destinations beyond say cis

1422
00:52:41,510 --> 00:52:39,839
lunar space or

1423
00:52:43,190 --> 00:52:41,520
to an asteroid to mars those kind of

1424
00:52:45,510 --> 00:52:43,200
destinations we're going to need some

1425
00:52:47,990 --> 00:52:45,520
habitation capability or some larger

1426
00:52:49,589 --> 00:52:48,000
volume for the crew to actually live in

1427
00:52:51,910 --> 00:52:49,599
and then the kind of the rescue

1428
00:52:54,470 --> 00:52:51,920
capability return capability comes from

1429
00:52:56,309 --> 00:52:54,480
the orion capsule so we do at some point

1430
00:52:58,150 --> 00:52:56,319
need to start looking once we start

1431
00:52:59,750 --> 00:52:58,160
picking destinations we need to go look

1432
00:53:02,309 --> 00:52:59,760
at what other hardware elements we need

1433
00:53:03,589 --> 00:53:02,319
to add such as a habitation module etc

1434
00:53:06,309 --> 00:53:03,599
as we start picking those other

1435
00:53:08,309 --> 00:53:06,319
destinations so so that's that's a good

1436
00:53:09,829 --> 00:53:08,319
point and we'll go look at those the

1437
00:53:12,069 --> 00:53:09,839
other thing i think i would also stress

1438
00:53:13,910 --> 00:53:12,079

too is you know we did this arrangement

1439
00:53:15,670 --> 00:53:13,920
with the european space agency we're

1440
00:53:17,030 --> 00:53:15,680
also looking with our other partners

1441
00:53:19,270 --> 00:53:17,040
throughout the international space

1442
00:53:20,790 --> 00:53:19,280
station program and then through other

1443
00:53:22,870 --> 00:53:20,800
exploration activities looking at

1444
00:53:24,870 --> 00:53:22,880
partners even beyond the

1445
00:53:26,630 --> 00:53:24,880
the iss team to see if there's other

1446
00:53:29,349 --> 00:53:26,640
contributions that folks might want to

1447
00:53:31,670 --> 00:53:29,359
be interested in making to help us move

1448
00:53:33,750 --> 00:53:31,680
into exploration because i truly believe

1449
00:53:35,270 --> 00:53:33,760
exploration beyond low earth orbit is

1450
00:53:37,829 --> 00:53:35,280
going to have to be

1451
00:53:39,910 --> 00:53:37,839
international in activity and it won't

1452
00:53:41,510 --> 00:53:39,920
be bilateral i think you'll see us

1453
00:53:43,750 --> 00:53:41,520
reaching out to other partners moving

1454
00:53:45,670 --> 00:53:43,760
forward to find ways to to put things

1455
00:53:48,549 --> 00:53:45,680
together that help us both achieve what

1456
00:53:50,230 --> 00:53:48,559
we want to go do so again if you go all

1457
00:53:51,990 --> 00:53:50,240
the way back to station the beauty of

1458
00:53:54,069 --> 00:53:52,000
station was we had a shared common

1459
00:53:56,309 --> 00:53:54,079
vision we wanted a research facility in

1460
00:53:58,950 --> 00:53:56,319
low earth orbit then we figured out how

1461
00:54:00,630 --> 00:53:58,960
internationally to put together an

1462
00:54:02,150 --> 00:54:00,640
arrangement that allowed us to actually

1463
00:54:04,309 --> 00:54:02,160

implement and build the international

1464
00:54:06,309 --> 00:54:04,319
space station now today you're getting

1465
00:54:08,790 --> 00:54:06,319
to see kind of that first step as we

1466
00:54:10,710 --> 00:54:08,800
look beyond low earth orbit this is that

1467
00:54:12,309 --> 00:54:10,720
first step in international agreements

1468
00:54:13,589 --> 00:54:12,319
which i think will be much larger than

1469
00:54:14,950 --> 00:54:13,599
even the station international

1470
00:54:16,470 --> 00:54:14,960
agreements as we move forward in

1471
00:54:18,309 --> 00:54:16,480
exploration to build all these other

1472
00:54:20,230 --> 00:54:18,319
systems that was asked in the question

1473
00:54:23,750 --> 00:54:20,240
that we're going to need to go do these

1474
00:54:25,349 --> 00:54:23,760
these things beyond low earth orbit

1475
00:54:26,630 --> 00:54:25,359
thanks for that question

1476
00:54:28,870 --> 00:54:26,640
sure

1477
00:54:31,990 --> 00:54:28,880
compliment

1478
00:54:34,470 --> 00:54:32,000
what bill has just mentioned to the part

1479
00:54:36,950 --> 00:54:34,480
of habitation mode i think in that

1480
00:54:39,430 --> 00:54:36,960
context it should also be pointed out

1481
00:54:42,230 --> 00:54:39,440
that we are using iss

1482
00:54:44,470 --> 00:54:42,240
apart from the research objectives that

1483
00:54:46,950 --> 00:54:44,480
we have as a platform for technologies

1484
00:54:49,030 --> 00:54:46,960
that are exactly going in that direction

1485
00:54:50,829 --> 00:54:49,040
also on international level there is a

1486
00:54:52,230 --> 00:54:50,839
working group

1487
00:54:55,109 --> 00:54:52,240
international um

1488
00:54:58,390 --> 00:54:55,119

space exploration uh working group which

1489
00:55:00,549 --> 00:54:58,400
um is looking at at uh different uh road

1490
00:55:01,910 --> 00:55:00,559
maps in order to

1491
00:55:03,750 --> 00:55:01,920
define the next steps and the

1492
00:55:05,030 --> 00:55:03,760
technologies needed so i think in this

1493
00:55:06,710 --> 00:55:05,040
context

1494
00:55:08,870 --> 00:55:06,720
we should also

1495
00:55:12,150 --> 00:55:08,880
still remind ourselves that we are using

1496
00:55:13,589 --> 00:55:12,160
iss also as a platform for technology

1497
00:55:16,230 --> 00:55:13,599
exactly in that direction you were

1498
00:55:20,390 --> 00:55:17,750
okay thanks for that question and you

1499
00:55:23,349 --> 00:55:20,400
can find our social media outlets for

1500
00:55:24,710 --> 00:55:23,359
nasa online at nasa.gov connect any

1501
00:55:26,630 --> 00:55:24,720
other follow-up questions here in the

1502
00:55:28,069 --> 00:55:26,640
room

1503
00:55:30,230 --> 00:55:28,079
okay since i don't see any i think that

1504
00:55:32,150 --> 00:55:30,240
wraps up our briefing for today you can

1505
00:55:34,150 --> 00:55:32,160
find uh photos videos and more

1506
00:55:38,230 --> 00:55:34,160
information about this and other orion

1507
00:55:40,470 --> 00:55:38,240
related news online at www.nasa.gov

1508
00:55:42,549 --> 00:55:40,480
orion and we'll go back now to the

1509
00:55:45,190 --> 00:55:42,559
regular nasa tv programming but tune in

1510
00:55:47,829 --> 00:55:45,200
tomorrow for the iss expedition 35 and

1511
00:55:49,349 --> 00:55:47,839
36 briefings which begin at 11 a.m

1512
00:55:50,870 --> 00:55:49,359
central and that's following our daily