1
00:00:06,389 --> 00:00:04,150
thank you um

2
00:00:09,270 --> 00:00:06,399
thanks thanks to all of you for allowing

3
00:00:11,190 --> 00:00:09,280
me to to intrude on your day

4
00:00:15,190 --> 00:00:11,200
uh i know everything usually goes pretty

5
00:00:19,189 --> 00:00:17,830
i call her dr ro from langley i know all

6
00:00:21,109 --> 00:00:19,199
of you know her i i've had an

7
00:00:23,670 --> 00:00:21,119
opportunity to meet some of you

8
00:00:26,150 --> 00:00:23,680
uh particularly those from boeing i'll

9
00:00:28,230 --> 00:00:26,160
single you out because i i promised that

10
00:00:31,990 --> 00:00:28,240
i was going to use you

11
00:00:34,150 --> 00:00:32,000
uh any good way okay in in my comments

12
00:00:36,630 --> 00:00:34,160
today but but i want to thank jaywan

13
00:00:38,869 --> 00:00:36,640

again for uh for inviting me to come out

14
00:00:41,190 --> 00:00:38,879
uh pete thanks very much to you for uh

15
00:00:42,790 --> 00:00:41,200
providing the facilities and for for

16
00:00:44,310 --> 00:00:42,800
allowing me to spend just a little bit

17
00:00:46,790 --> 00:00:44,320
of time with some of your leadership

18
00:00:48,310 --> 00:00:46,800
team as i said again i i apologize for

19
00:00:49,750 --> 00:00:48,320
not being able to spend more time out

20
00:00:52,229 --> 00:00:49,760
here um

21
00:00:53,029 --> 00:00:52,239
but i will i will be back

22
00:00:56,310 --> 00:00:53,039
um

23
00:00:59,110 --> 00:00:56,320
the long history of aviation comes

24
00:01:01,110 --> 00:00:59,120
it comes alive out here and it should be

25
00:01:02,310 --> 00:01:01,120
hopefully coming alive again in this

26
00:01:05,350 --> 00:01:02,320
conference

27
00:01:07,270 --> 00:01:05,360
uh as a trained pilot myself um who

28
00:01:08,310 --> 00:01:07,280
doesn't fly very much anymore and so it

29
00:01:10,310 --> 00:01:08,320
was really

30
00:01:12,070 --> 00:01:10,320
thrilling for me to get over to the vms

31
00:01:14,630 --> 00:01:12,080
and have an opportunity to fly a tilt

32
00:01:16,550 --> 00:01:14,640
rotor aircraft this morning

33
00:01:18,710 --> 00:01:16,560
and i've been in the simulator before

34
00:01:20,230 --> 00:01:18,720
but still have not flown the osprey and

35
00:01:21,990 --> 00:01:20,240
probably won't get to fly it so that was

36
00:01:24,070 --> 00:01:22,000
the closest i'll get to a tilt rotor

37
00:01:24,830 --> 00:01:24,080
aircraft but i had a good time and i did

38
00:01:28,550 --> 00:01:24,840

not

39
00:01:30,950 --> 00:01:28,560
crash but i i love just

40
00:01:33,270 --> 00:01:30,960
being soaked up in this atmosphere it's

41
00:01:35,510 --> 00:01:33,280
it allows me to come alive because

42
00:01:38,310 --> 00:01:35,520
washington's okay

43
00:01:40,710 --> 00:01:38,320
but we don't do this kind of fun stuff

44
00:01:42,630 --> 00:01:40,720
uh most of the time um

45
00:01:44,550 --> 00:01:42,640
i have to say on the plane ride out here

46
00:01:47,030 --> 00:01:44,560
from we came in from indianapolis after

47
00:01:48,710 --> 00:01:47,040
having spent yesterday at purdue

48
00:01:51,670 --> 00:01:48,720
um

49
00:01:53,429 --> 00:01:51,680
i i was daydreaming a little bit about

50
00:01:54,389 --> 00:01:53,439
what some of the aircraft of the future

51
00:01:56,870 --> 00:01:54,399
will look like

52
00:01:58,389 --> 00:01:56,880
and i tend to do that a lot

53
00:01:59,830 --> 00:01:58,399
and that's why it was really special to

54
00:02:01,990 --> 00:01:59,840
have an opportunity to get into tilt

55
00:02:03,749 --> 00:02:02,000
rotor simulator this

56
00:02:05,910 --> 00:02:03,759
this morning or this afternoon i guess

57
00:02:07,190 --> 00:02:05,920
because as i was telling some of the

58
00:02:08,790 --> 00:02:07,200
folk over there

59
00:02:10,389 --> 00:02:08,800
i have long believed since the marine

60
00:02:13,190 --> 00:02:10,399
corps decided that we were going to go

61
00:02:14,630 --> 00:02:13,200
with the osprey many many many many

62
00:02:17,270 --> 00:02:14,640
years ago after

63
00:02:19,110 --> 00:02:17,280

discovering the xv15 that nasa had

64
00:02:22,229 --> 00:02:19,120
worked on

65
00:02:24,150 --> 00:02:22,239
i remember telling people that this is

66
00:02:27,030 --> 00:02:24,160
really the wave of the future and while

67
00:02:28,949 --> 00:02:27,040
we are not there yet commercially

68
00:02:31,110 --> 00:02:28,959
i really do believe that tilt rotor

69
00:02:33,509 --> 00:02:31,120
aviation is going to revolutionize a lot

70
00:02:35,430 --> 00:02:33,519
of the things that we do having served

71
00:02:36,630 --> 00:02:35,440
on a board of an oil company

72
00:02:38,229 --> 00:02:36,640
i'll tell you we have to start

73
00:02:40,949 --> 00:02:38,239
evacuating

74
00:02:43,110 --> 00:02:40,959
offshore platforms

75
00:02:45,670 --> 00:02:43,120
days in advance when there is a threat

76
00:02:47,270 --> 00:02:45,680
of a storm or something like that

77
00:02:48,869 --> 00:02:47,280
something like a tilt rotor aircraft

78
00:02:51,190 --> 00:02:48,879
that can travel

79
00:02:53,030 --> 00:02:51,200
300 knots or better

80
00:02:56,309 --> 00:02:53,040
uh cuts the time that you'd have to take

81
00:02:59,509 --> 00:02:56,319
to evacuate crews to to hours instead of

82
00:03:01,270 --> 00:02:59,519
days so in terms of dollars saved uh

83
00:03:03,190 --> 00:03:01,280
it's incredible what i think tilt rotor

84
00:03:05,830 --> 00:03:03,200
aviation is going to do not just to that

85
00:03:07,190 --> 00:03:05,840
industry but to to the commercial world

86
00:03:08,070 --> 00:03:07,200
in general

87
00:03:09,910 --> 00:03:08,080
um

88
00:03:12,550 --> 00:03:09,920

there are a lot of amazing concepts on

89
00:03:14,470 --> 00:03:12,560
nasa's zero website and and i know

90
00:03:17,270 --> 00:03:14,480
there are a lot of great great ideas and

91
00:03:19,430 --> 00:03:17,280
vibrant imaginations in this room

92
00:03:23,190 --> 00:03:19,440
i hope this summit is productive for all

93
00:03:25,350 --> 00:03:23,200
of you as well as for us in nasa um both

94
00:03:27,190 --> 00:03:25,360
as individuals and then as a as the

95
00:03:28,789 --> 00:03:27,200
field of those in the field of

96
00:03:31,110 --> 00:03:28,799
aeronautics

97
00:03:32,550 --> 00:03:31,120
my plane ride really my my whole airport

98
00:03:35,750 --> 00:03:32,560
experience today

99
00:03:37,110 --> 00:03:35,760
it wasn't too bad believe it or not um

100
00:03:39,030 --> 00:03:37,120
but in the future i think it will

101
00:03:40,710 --> 00:03:39,040
probably be a lot better

102
00:03:43,190 --> 00:03:40,720
quieter and more efficient flights will

103
00:03:45,110 --> 00:03:43,200
mean none of us will have to worry about

104
00:03:46,789 --> 00:03:45,120
you know that our air travel is

105
00:03:48,149 --> 00:03:46,799
polluting the air or

106
00:03:49,830 --> 00:03:48,159
that it's polluting the sonic

107
00:03:51,350 --> 00:03:49,840
environment of our neighbors

108
00:03:52,949 --> 00:03:51,360
i'm hoping you're all dedicated to

109
00:03:54,949 --> 00:03:52,959
helping bring about these important

110
00:03:57,110 --> 00:03:54,959
improvements in aviation

111
00:03:58,869 --> 00:03:57,120
your work here and in the future will

112
00:04:00,550 --> 00:03:58,879
have a huge impact

113
00:04:02,229 --> 00:04:00,560

i often find myself

114
00:04:04,229 --> 00:04:02,239
having to explain to people the benefits

115
00:04:05,270 --> 00:04:04,239
of space exploration to life here on

116
00:04:07,589 --> 00:04:05,280
earth

117
00:04:09,509 --> 00:04:07,599
but in aeronautics the positive gains

118
00:04:11,910 --> 00:04:09,519
from what we do

119
00:04:14,070 --> 00:04:11,920
should be a little easier for anyone who

120
00:04:15,910 --> 00:04:14,080
has ever walked through an airport and

121
00:04:18,390 --> 00:04:15,920
struggled with our air transportation

122
00:04:20,629 --> 00:04:18,400
system to see these benefits

123
00:04:23,430 --> 00:04:20,639
our critical responsibility

124
00:04:25,030 --> 00:04:23,440
is though as those who feel anxious

125
00:04:27,749 --> 00:04:25,040
is to those who feel anxious because of

126
00:04:29,110 --> 00:04:27,759
the long distance they have to travel to

127
00:04:31,110 --> 00:04:29,120
reach an airport

128
00:04:33,590 --> 00:04:31,120
the crowding the experience upon arrival

129
00:04:35,909 --> 00:04:33,600
at the terminal the departure in route

130
00:04:38,230 --> 00:04:35,919
or rival weather or concerns that the

131
00:04:40,629 --> 00:04:38,240
technology on the planes may not be up

132
00:04:43,350 --> 00:04:40,639
to dealing with problems that they guess

133
00:04:45,189 --> 00:04:43,360
they're going to encounter in the sky

134
00:04:47,430 --> 00:04:45,199
that's why we're so excited at nasa

135
00:04:49,270 --> 00:04:47,440
about the opportunities we are being

136
00:04:51,749 --> 00:04:49,280
given in the coming years to help

137
00:04:54,310 --> 00:04:51,759
develop solutions to some of our most

138
00:04:55,590 --> 00:04:54,320

pressing aviation problems and create

139
00:04:57,830 --> 00:04:55,600
the next generation of air

140
00:05:00,629 --> 00:04:57,840
transportation systems that will last

141
00:05:03,189 --> 00:05:00,639
for generations and make us all safer

142
00:05:05,270 --> 00:05:03,199
and make the planet a better place

143
00:05:07,670 --> 00:05:05,280
that's a huge challenge but we at nasa

144
00:05:09,510 --> 00:05:07,680
enthusiastically accept it

145
00:05:11,830 --> 00:05:09,520
just as i like to tell scientists and

146
00:05:14,550 --> 00:05:11,840
engineers who send our human and robotic

147
00:05:17,029 --> 00:05:14,560
missions out into the cosmos

148
00:05:19,110 --> 00:05:17,039
you are contributing to national goals

149
00:05:21,590 --> 00:05:19,120
and helping people in the in the work

150
00:05:23,350 --> 00:05:21,600
you do every day

151
00:05:25,909 --> 00:05:23,360
we're going to make measured progress

152
00:05:27,590 --> 00:05:25,919
leading to an ever expanding acknowledge

153
00:05:30,070 --> 00:05:27,600
accomplishments to meet the myriad

154
00:05:32,150 --> 00:05:30,080
increasing increasing challenges

155
00:05:34,150 --> 00:05:32,160
this is our challenge to shape the

156
00:05:36,550 --> 00:05:34,160
future in aeronautics

157
00:05:38,070 --> 00:05:36,560
over the past 70 years or so air travel

158
00:05:39,830 --> 00:05:38,080
has become one of the world's safest

159
00:05:42,390 --> 00:05:39,840
modes of transportation

160
00:05:44,870 --> 00:05:42,400
and a vital part of the world economy

161
00:05:47,749 --> 00:05:44,880
but even with this tremendous progress

162
00:05:50,310 --> 00:05:47,759
new challenges continue to surface

163
00:05:52,070 --> 00:05:50,320

it's no secret that our airports and our

164
00:05:53,189 --> 00:05:52,080
airplanes are getting more and more

165
00:05:55,670 --> 00:05:53,199
crowded

166
00:05:58,550 --> 00:05:55,680
in the united states 60 certified

167
00:06:00,230 --> 00:05:58,560
domestic carriers operate more than 28

168
00:06:02,550 --> 00:06:00,240
000 flights a day

169
00:06:04,710 --> 00:06:02,560
last year alone they moved more than 700

170
00:06:10,629 --> 00:06:04,720
million passengers a number that's

171
00:06:14,950 --> 00:06:13,510
here's what the sky overhead looks like

172
00:06:17,029 --> 00:06:14,960
right now

173
00:06:19,350 --> 00:06:17,039
and that's real

174
00:06:21,350 --> 00:06:19,360
that looks like a traffic jam to me

175
00:06:23,590 --> 00:06:21,360
just imagine what it will look like 20

176
00:06:24,950 --> 00:06:23,600
years from now with almost double the

177
00:06:28,309 --> 00:06:24,960
demand

178
00:06:30,629 --> 00:06:28,319
controllers

179
00:06:32,390 --> 00:06:30,639
our aging air traffic control systems

180
00:06:35,029 --> 00:06:32,400
need new capabilities

181
00:06:36,870 --> 00:06:35,039
new technologies and new ways of looking

182
00:06:39,110 --> 00:06:36,880
at the big picture

183
00:06:41,590 --> 00:06:39,120
as we are doing in space flight

184
00:06:44,150 --> 00:06:41,600
we're looking at where we want to be

185
00:06:45,830 --> 00:06:44,160
not just a few years down the road but

186
00:06:47,749 --> 00:06:45,840
decades from now

187
00:06:51,029 --> 00:06:47,759
and we're making decisions about what we

188
00:06:52,309 --> 00:06:51,039

need to do today to get there

189
00:06:54,390 --> 00:06:52,319
today

190
00:06:56,469 --> 00:06:54,400
commercial aviation provides jobs for

191
00:06:58,629 --> 00:06:56,479
nearly one million americans

192
00:07:01,589 --> 00:06:58,639
the aerospace manufacturing industry

193
00:07:03,589 --> 00:07:01,599
provides the nation with a 60 billion

194
00:07:05,589 --> 00:07:03,599
dollar trade surplus

195
00:07:07,670 --> 00:07:05,599
but the capacity of our system to

196
00:07:10,230 --> 00:07:07,680
operate the way we do now

197
00:07:12,390 --> 00:07:10,240
and the increased traffic's toll on the

198
00:07:15,029 --> 00:07:12,400
environment and our system's own

199
00:07:16,469 --> 00:07:15,039
infrastructure are factors we need to

200
00:07:18,870 --> 00:07:16,479
address

201
00:07:20,550 --> 00:07:18,880
we need to make some changes both in the

202
00:07:22,550 --> 00:07:20,560
design of aircraft

203
00:07:23,670 --> 00:07:22,560
and in the way they transit through our

204
00:07:26,629 --> 00:07:23,680
skies

205
00:07:28,710 --> 00:07:26,639
to not only maintain but improve safety

206
00:07:30,710 --> 00:07:28,720
and efficiency yes

207
00:07:32,870 --> 00:07:30,720
i'm going to use a word that has become

208
00:07:34,469 --> 00:07:32,880
integral to my vocabulary we're going to

209
00:07:36,790 --> 00:07:34,479
have to innovate

210
00:07:39,909 --> 00:07:36,800
nasa aeronautics is finding answers to

211
00:07:42,710 --> 00:07:39,919
the challenges we face

212
00:07:45,589 --> 00:07:42,720
for decades nasa has worked to improve

213
00:07:47,430 --> 00:07:45,599

the performance efficiency and safety of

214
00:07:49,909 --> 00:07:47,440
our aviation system

215
00:07:52,790 --> 00:07:49,919
nearly every airplane that exists today

216
00:07:54,710 --> 00:07:52,800
uses technology made possible in part by

217
00:07:56,629 --> 00:07:54,720
nasa research

218
00:07:58,710 --> 00:07:56,639
we're present in the innovative aircraft

219
00:08:01,029 --> 00:07:58,720
themselves and the air traffic

220
00:08:03,029 --> 00:08:01,039
management systems that help make them

221
00:08:05,510 --> 00:08:03,039
safe and efficient

222
00:08:07,749 --> 00:08:05,520
when it comes to nasa's contributions to

223
00:08:09,430 --> 00:08:07,759
environmentally friendly aviation

224
00:08:12,950 --> 00:08:09,440
the list of technologies we have

225
00:08:15,510 --> 00:08:12,960
developed that are in use today is long

226
00:08:17,830 --> 00:08:15,520
and comprehensive

227
00:08:19,350 --> 00:08:17,840
the most recent example is the chevron

228
00:08:22,150 --> 00:08:19,360
nozzle i was talking to my boying

229
00:08:24,070 --> 00:08:22,160
friends about this um it's similar this

230
00:08:27,070 --> 00:08:24,080
is similar to the ones that we will be

231
00:08:29,749 --> 00:08:27,080
flying on boeing's new 787 and

232
00:08:31,189 --> 00:08:29,759
747-8 airplanes

233
00:08:33,589 --> 00:08:31,199
another thing i'll tell you about this

234
00:08:35,750 --> 00:08:33,599
is not in my comments so

235
00:08:38,469 --> 00:08:35,760
somebody from boeing can stop me if i

236
00:08:40,949 --> 00:08:38,479
get it wrong as the as the

237
00:08:42,790 --> 00:08:40,959
the dreamliners taxiing out there when

238
00:08:45,350 --> 00:08:42,800

we were in farnborough for the farnberry

239
00:08:47,590 --> 00:08:45,360
air show i i got an opportunity to look

240
00:08:49,350 --> 00:08:47,600
at that airplane up close and personal

241
00:08:51,430 --> 00:08:49,360
in the chevron nozzles and as we were

242
00:08:55,110 --> 00:08:51,440
standing there they were explaining to

243
00:08:57,509 --> 00:08:55,120
me about the memory alloy uh of which

244
00:08:59,430 --> 00:08:57,519
the nozzles are made

245
00:09:02,150 --> 00:08:59,440
we and nasa are very proud of it because

246
00:09:04,630 --> 00:09:02,160
we we may not be we can't take all the

247
00:09:07,030 --> 00:09:04,640
credit but it's but i was incredibly

248
00:09:10,389 --> 00:09:07,040
proud to see that boeing had decided to

249
00:09:12,070 --> 00:09:10,399
use that type of technology

250
00:09:14,230 --> 00:09:12,080
in the nozzles themselves for those of

251
00:09:16,710 --> 00:09:14,240
you who may not know what it does

252
00:09:19,190 --> 00:09:16,720
it's an alloy that has a memory just as

253
00:09:21,509 --> 00:09:19,200
the name implies and it knows that if i

254
00:09:22,389 --> 00:09:21,519
was at this altitude and it was this

255
00:09:24,790 --> 00:09:22,399
temperature

256
00:09:27,110 --> 00:09:24,800
yesterday and i got the best efficiency

257
00:09:29,269 --> 00:09:27,120
by squeezing down myself

258
00:09:31,509 --> 00:09:29,279
to be this size and let the airflow come

259
00:09:33,030 --> 00:09:31,519
out like this that's good

260
00:09:36,070 --> 00:09:33,040
and so as the airplane climbs or

261
00:09:38,550 --> 00:09:36,080
descends the memory alloy uh actually

262
00:09:40,550 --> 00:09:38,560
makes the nozzle move around such that

263
00:09:42,470 --> 00:09:40,560

we get the best efficiency out of it so

264
00:09:46,310 --> 00:09:42,480
did i get that close

265
00:09:48,230 --> 00:09:46,320
all right boeing guys was that close

266
00:09:50,550 --> 00:09:48,240
huh that's okay

267
00:09:51,590 --> 00:09:50,560
you're gonna send me some notes and

268
00:09:53,190 --> 00:09:51,600
okay

269
00:09:54,710 --> 00:09:53,200
you know i'll get it we'll get it right

270
00:09:57,269 --> 00:09:54,720
all right but that's my way of

271
00:09:58,230 --> 00:09:57,279
explaining it i think it's pretty good

272
00:10:00,310 --> 00:09:58,240
um

273
00:10:01,750 --> 00:10:00,320
we already see the sawtooth shapes at

274
00:10:03,590 --> 00:10:01,760
the back of the engine on on the

275
00:10:05,190 --> 00:10:03,600
aircraft that i just talked about they

276
00:10:07,350 --> 00:10:05,200
reduce engine noise significantly

277
00:10:09,910 --> 00:10:07,360
without penalizing engine performance

278
00:10:11,110 --> 00:10:09,920
and as i said before they are a nasa

279
00:10:12,870 --> 00:10:11,120
innovation

280
00:10:13,990 --> 00:10:12,880
in the not too distant future thanks to

281
00:10:15,990 --> 00:10:14,000
nasa

282
00:10:17,910 --> 00:10:16,000
you may be able to live near an airport

283
00:10:20,389 --> 00:10:17,920
and not suffer the wine of jet engines

284
00:10:21,750 --> 00:10:20,399
revving up from for takeoff when you're

285
00:10:23,910 --> 00:10:21,760
trying to sleep

286
00:10:25,430 --> 00:10:23,920
nuisance noise near major metropolitan

287
00:10:27,910 --> 00:10:25,440
airports is seen as one of the greatest

288
00:10:30,790 --> 00:10:27,920

hindrances to the future growth of the

289
00:10:34,470 --> 00:10:30,800
aviation system so the advent of chevron

290
00:10:36,790 --> 00:10:34,480
nozzles like this is especially timely

291
00:10:39,269 --> 00:10:36,800
another nasa innovation the little

292
00:10:40,790 --> 00:10:39,279
upturn ends of the wings you see here

293
00:10:42,790 --> 00:10:40,800
came about when the environmental

294
00:10:45,430 --> 00:10:42,800
awareness and the energy shortages of

295
00:10:47,590 --> 00:10:45,440
the seventies prompted demands to save

296
00:10:49,430 --> 00:10:47,600
fuel and stop polluting

297
00:10:51,509 --> 00:10:49,440
winglets reduce drag and fuel

298
00:10:52,870 --> 00:10:51,519
consumption and most of the airlines

299
00:10:54,550 --> 00:10:52,880
today

300
00:10:56,389 --> 00:10:54,560
have them in service

301
00:10:58,389 --> 00:10:56,399
we want to show that it's possible to

302
00:11:01,590 --> 00:10:58,399
reduce aircraft fuel consumption

303
00:11:05,670 --> 00:11:01,600
emissions and noise simultaneously each

304
00:11:07,269 --> 00:11:05,680
of these is a lofty goal in itself

305
00:11:09,190 --> 00:11:07,279
we're working on demonstrating the

306
00:11:11,670 --> 00:11:09,200
feasibility of technologies that would

307
00:11:15,110 --> 00:11:11,680
enable aircraft to burn 33 percent less

308
00:11:17,269 --> 00:11:15,120
fuel than today's most efficient models

309
00:11:19,509 --> 00:11:17,279
we hope to make a lot more progress on

310
00:11:21,110 --> 00:11:19,519
those technologies within the next five

311
00:11:23,750 --> 00:11:21,120
years

312
00:11:25,430 --> 00:11:23,760
with help from aircraft technology and

313
00:11:27,829 --> 00:11:25,440

air traffic management techniques

314
00:11:30,389 --> 00:11:27,839
developed by nasa harmful carbon

315
00:11:33,030 --> 00:11:30,399
emissions from airplanes could level off

316
00:11:34,230 --> 00:11:33,040
and begin to dissipate in just 10 years

317
00:11:36,389 --> 00:11:34,240
time

318
00:11:39,350 --> 00:11:36,399
our goals are ambitious

319
00:11:42,870 --> 00:11:39,360
all the more so when tackled together

320
00:11:45,030 --> 00:11:42,880
but i'm confident they're achievable

321
00:11:47,190 --> 00:11:45,040
enabled by nasa research

322
00:11:49,990 --> 00:11:47,200
us companies will begin designing

323
00:11:51,509 --> 00:11:50,000
airplanes with unconventional shapes

324
00:11:52,790 --> 00:11:51,519
and building them

325
00:11:55,110 --> 00:11:52,800
with new

326
00:11:57,590 --> 00:11:55,120
lightweight composite materials and

327
00:11:59,110 --> 00:11:57,600
structures to increase lift

328
00:12:02,470 --> 00:11:59,120
reduce drag

329
00:12:04,870 --> 00:12:02,480
and lessen the strain on engines

330
00:12:09,750 --> 00:12:07,990
anybody recognize this

331
00:12:11,509 --> 00:12:09,760
this is an example of a new damage

332
00:12:14,069 --> 00:12:11,519
tolerant airplane material nasa is

333
00:12:15,750 --> 00:12:14,079
developing it's called perseus

334
00:12:17,590 --> 00:12:15,760
if i really wanted to impress you i

335
00:12:19,990 --> 00:12:17,600
would give you the full name of what the

336
00:12:21,750 --> 00:12:20,000
acronym perseus stands for but since i

337
00:12:23,509 --> 00:12:21,760
really don't want to impress you

338
00:12:25,269 --> 00:12:23,519

then i'm not going to try to remember

339
00:12:28,069 --> 00:12:25,279
that because beth dickey tried to teach

340
00:12:30,629 --> 00:12:28,079
it to me and i all i remember is one of

341
00:12:32,790 --> 00:12:30,639
these s's stands for stitching

342
00:12:35,350 --> 00:12:32,800
uh and that's probably the key to the

343
00:12:37,190 --> 00:12:35,360
technology how we you know the when a

344
00:12:38,550 --> 00:12:37,200
crack runs into the cross stitching it

345
00:12:40,550 --> 00:12:38,560
stops it so

346
00:12:42,550 --> 00:12:40,560
again in a layman's term that's one of

347
00:12:44,389 --> 00:12:42,560
the advantages of the material

348
00:12:45,910 --> 00:12:44,399
not only will these airplanes look

349
00:12:47,509 --> 00:12:45,920
really cool

350
00:12:49,750 --> 00:12:47,519
but they'll have breakthroughs like

351
00:12:52,550 --> 00:12:49,760
engines to handle more air which can be

352
00:12:55,509 --> 00:12:52,560
placed in unusual places on the airplane

353
00:12:57,110 --> 00:12:55,519
and deflect their sound

354
00:12:59,030 --> 00:12:57,120
did i skip something there because you

355
00:13:01,430 --> 00:12:59,040
had a video i think that i really wanted

356
00:13:03,269 --> 00:13:01,440
people to see or did you already see it

357
00:13:04,949 --> 00:13:03,279
it was one we're gonna you know we'll do

358
00:13:07,509 --> 00:13:04,959
this by okay i don't want you to miss

359
00:13:09,430 --> 00:13:07,519
anything because i had some some

360
00:13:10,790 --> 00:13:09,440
futuristic airplane stuff here that i

361
00:13:13,509 --> 00:13:10,800
wanted you to see

362
00:13:15,829 --> 00:13:13,519
and so i'll stall for time while they

363
00:13:18,389 --> 00:13:15,839

while they try to find it okay

364
00:13:21,670 --> 00:13:18,399
i don't know whether that's it or not

365
00:13:22,710 --> 00:13:21,680
ah okay here we come

366
00:13:26,790 --> 00:13:22,720
and i'll

367
00:13:31,509 --> 00:13:30,069
good okay you saw the big perseus and

368
00:13:35,670 --> 00:13:31,519
then here's some of these imaginative

369
00:13:37,110 --> 00:13:35,680
airplanes i was talking about okay

370
00:13:39,030 --> 00:13:37,120
these innovations will help us

371
00:13:41,350 --> 00:13:39,040
capitalize on the potential of

372
00:13:42,550 --> 00:13:41,360
alternative fuels and advanced power

373
00:13:45,030 --> 00:13:42,560
technologies

374
00:13:46,870 --> 00:13:45,040
we'll begin equipping aircraft cockpits

375
00:13:49,350 --> 00:13:46,880
with automated decision tools and

376
00:13:51,590 --> 00:13:49,360
satellite-based air traffic information

377
00:13:54,550 --> 00:13:51,600
and communication systems to let

378
00:13:57,189 --> 00:13:54,560
airplanes climb or descend without

379
00:13:59,350 --> 00:13:57,199
interruption and fly more direct routes

380
00:14:01,590 --> 00:13:59,360
to their destinations this stuff's

381
00:14:03,829 --> 00:14:01,600
really fun so i mean enjoy it i'm

382
00:14:06,629 --> 00:14:03,839
watching the movie okay

383
00:14:08,230 --> 00:14:06,639
that's why i keep getting distracted

384
00:14:11,350 --> 00:14:08,240
you can go through that one i always you

385
00:14:15,829 --> 00:14:13,910
you can go to the next one

386
00:14:17,430 --> 00:14:15,839
there we go

387
00:14:19,670 --> 00:14:17,440
i showed you the current state of

388
00:14:21,509 --> 00:14:19,680

affairs a few minutes ago

389
00:14:23,590 --> 00:14:21,519
here is what the future of america's

390
00:14:25,509 --> 00:14:23,600
airspace system could look like

391
00:14:27,189 --> 00:14:25,519
the system is elastic

392
00:14:29,509 --> 00:14:27,199
distributing the air traffic control

393
00:14:32,230 --> 00:14:29,519
burden between the airport tower and the

394
00:14:34,310 --> 00:14:32,240
cockpit allows maximum flexibility

395
00:14:35,990 --> 00:14:34,320
the system expands as necessary to

396
00:14:38,949 --> 00:14:36,000
accommodate demand

397
00:14:41,350 --> 00:14:38,959
not only for everyday transport but also

398
00:14:46,790 --> 00:14:41,360
for new missions by very different kinds

399
00:14:51,189 --> 00:14:48,710
nasa didn't achieve any of its past

400
00:14:53,189 --> 00:14:51,199
breakthroughs in aeronautics alone

401
00:14:55,269 --> 00:14:53,199
nor will we achieve any of the future

402
00:14:57,269 --> 00:14:55,279
breakthroughs by ourselves

403
00:15:00,389 --> 00:14:57,279
our partnerships with other government

404
00:15:02,470 --> 00:15:00,399
agencies industry and academia are

405
00:15:04,310 --> 00:15:02,480
crucial to our success

406
00:15:05,750 --> 00:15:04,320
in partnership with the federal aviation

407
00:15:08,150 --> 00:15:05,760
administration and the department of

408
00:15:09,670 --> 00:15:08,160
defense for instance nasa is developing

409
00:15:12,310 --> 00:15:09,680
safe and efficient air traffic

410
00:15:14,389 --> 00:15:12,320
management and operational procedures

411
00:15:15,990 --> 00:15:14,399
using satellite-based navigation aids

412
00:15:18,550 --> 00:15:16,000
for the air traffic control

413
00:15:21,189 --> 00:15:18,560

modernization effort known as the next

414
00:15:22,949 --> 00:15:21,199
generation air transportation system or

415
00:15:25,430 --> 00:15:22,959
next gen

416
00:15:27,189 --> 00:15:25,440
another example close to my heart is our

417
00:15:29,509 --> 00:15:27,199
work to solicit fresh ideas from

418
00:15:31,189 --> 00:15:29,519
industry and academia through nasa

419
00:15:33,670 --> 00:15:31,199
research announcements

420
00:15:36,470 --> 00:15:33,680
student design competitions and

421
00:15:39,350 --> 00:15:36,480
internships all of which provide support

422
00:15:42,230 --> 00:15:39,360
for university science technology

423
00:15:44,389 --> 00:15:42,240
engineering and mathematics departments

424
00:15:46,150 --> 00:15:44,399
we've also just opened the application

425
00:15:48,230 --> 00:15:46,160
period for this year's aeronautics

426
00:15:49,829 --> 00:15:48,240
scholarships for undergraduate and

427
00:15:51,590 --> 00:15:49,839
graduate students

428
00:15:54,069 --> 00:15:51,600
and we look forward to helping to jump

429
00:15:56,310 --> 00:15:54,079
start the studies and the careers of

430
00:15:57,990 --> 00:15:56,320
these future leaders

431
00:16:01,030 --> 00:15:58,000
our close collaboration with our

432
00:16:03,269 --> 00:16:01,040
stakeholders helps us ensure that we are

433
00:16:05,189 --> 00:16:03,279
working on the right challenges

434
00:16:07,990 --> 00:16:05,199
that our research is both relevant in

435
00:16:09,829 --> 00:16:08,000
the aviation community and beneficial to

436
00:16:11,430 --> 00:16:09,839
the flying public

437
00:16:13,269 --> 00:16:11,440
nasa is fortunate

438
00:16:15,670 --> 00:16:13,279

there's a strong public support for

439
00:16:17,829 --> 00:16:15,680
aeronautics research as evidenced by the

440
00:16:18,949 --> 00:16:17,839
recent budget increases approved by

441
00:16:20,790 --> 00:16:18,959
congress

442
00:16:23,990 --> 00:16:20,800
the president has requested another

443
00:16:27,189 --> 00:16:24,000
increase to almost 580 million for nasa

444
00:16:29,030 --> 00:16:27,199
aeronautics in 2011 and congress appears

445
00:16:31,189 --> 00:16:29,040
to be supportive of this

446
00:16:33,269 --> 00:16:31,199
the president's budget strongly supports

447
00:16:35,670 --> 00:16:33,279
our existing portfolio of research and

448
00:16:37,189 --> 00:16:35,680
development and the timely development

449
00:16:39,110 --> 00:16:37,199
of nexgen

450
00:16:41,509 --> 00:16:39,120
with congress's approval of this

451
00:16:44,150 --> 00:16:41,519
increase nasa will help expand our

452
00:16:46,629 --> 00:16:44,160
system's capacity and focus on work to

453
00:16:48,389 --> 00:16:46,639
enable fuel-efficient flight planning

454
00:16:51,269 --> 00:16:48,399
reduce the overall environmental

455
00:16:53,749 --> 00:16:51,279
footprint of airplanes reduce delays on

456
00:16:55,670 --> 00:16:53,759
the ground and in the sky and improve

457
00:16:57,910 --> 00:16:55,680
the ability to operate in poor weather

458
00:17:00,310 --> 00:16:57,920
conditions while maintaining the current

459
00:17:01,670 --> 00:17:00,320
high safety standards of our aviation

460
00:17:03,189 --> 00:17:01,680
system

461
00:17:05,429 --> 00:17:03,199
our efforts will facilitate the

462
00:17:06,870 --> 00:17:05,439
transition of new capabilities to

463
00:17:09,029 --> 00:17:06,880

manufacturers

464
00:17:11,750 --> 00:17:09,039
airlines and the federal aviation

465
00:17:14,470 --> 00:17:11,760
administration for the ultimate benefit

466
00:17:16,470 --> 00:17:14,480
of the flying public

467
00:17:18,470 --> 00:17:16,480
nasa aeronautics has a long and

468
00:17:21,350 --> 00:17:18,480
prestigious history of vital

469
00:17:22,630 --> 00:17:21,360
contributions to america's aviation

470
00:17:25,350 --> 00:17:22,640
community

471
00:17:28,069 --> 00:17:25,360
green may be the new hot topic in the

472
00:17:29,909 --> 00:17:28,079
21st century america but the principles

473
00:17:32,470 --> 00:17:29,919
of environmental responsibility has

474
00:17:34,870 --> 00:17:32,480
guided nasa's research goals since the

475
00:17:37,110 --> 00:17:34,880
earliest days of aviation

476
00:17:39,750 --> 00:17:37,120
this summit celebrates technical

477
00:17:43,190 --> 00:17:39,760
excellence and the power of partnerships

478
00:17:45,270 --> 00:17:43,200
in advancing u.s preeminence in aviation

479
00:17:47,590 --> 00:17:45,280
you will see not only the depth and

480
00:17:50,390 --> 00:17:47,600
breadth of nasa's green aviation

481
00:17:52,630 --> 00:17:50,400
research but also the scope of nasa's

482
00:17:53,590 --> 00:17:52,640
commitment to clean

483
00:17:56,070 --> 00:17:53,600
quiet

484
00:17:58,230 --> 00:17:56,080
efficient and safe air transportation

485
00:17:59,350 --> 00:17:58,240
and develop better quality of life for

486
00:18:01,350 --> 00:17:59,360
all

487
00:18:04,789 --> 00:18:01,360
we need your excitement

488
00:18:06,950 --> 00:18:04,799

your dedication and your innovation

489
00:18:09,029 --> 00:18:06,960
with your help nasa will continue to be

490
00:18:10,310 --> 00:18:09,039
a springboard for technological

491
00:18:12,470 --> 00:18:10,320
breakthroughs

492
00:18:15,350 --> 00:18:12,480
advances that bring incredible aircraft

493
00:18:17,510 --> 00:18:15,360
into being and change all of our lives

494
00:18:20,710 --> 00:18:17,520
for the better even when we don't see

495
00:18:22,870 --> 00:18:20,720
the complex systems behind our travel

496
00:18:25,190 --> 00:18:22,880
and we'll do it in a responsible way a

497
00:18:26,310 --> 00:18:25,200
way that makes us good stewards of our

498
00:18:29,430 --> 00:18:26,320
environment

499
00:18:31,110 --> 00:18:29,440
and the world green is much more than a

500
00:18:34,310 --> 00:18:31,120
buzzword to us

501
00:18:35,990 --> 00:18:34,320
it's part of every bolt we turn

502
00:18:37,590 --> 00:18:36,000
i congratulate you on all your

503
00:18:40,310 --> 00:18:37,600
outstanding achievements and look

504
00:18:41,990 --> 00:18:40,320
forward to many more in the coming years

505
00:18:43,830 --> 00:18:42,000
and i'll be thinking of you every time i

506
00:18:46,310 --> 00:18:43,840
board that airplane for my next trip

507
00:18:48,950 --> 00:18:46,320
which seems to come pretty frequently

508
00:18:50,789 --> 00:18:48,960
godspeed as we tell the astronauts and

509
00:19:01,350 --> 00:18:50,799
thank you all for being here thanks very

510
00:19:06,870 --> 00:19:04,710
we have about five minutes for questions

511
00:19:09,029 --> 00:19:06,880
if anyone would like to ask the

512
00:19:10,870 --> 00:19:09,039
administrator a question

513
00:19:12,549 --> 00:19:10,880

let's do as we did this morning please

514
00:19:15,110 --> 00:19:12,559
raise your hand we'll get a microphone

515
00:19:17,029 --> 00:19:15,120
to you wait for the mic and tell us your

516
00:19:18,710 --> 00:19:17,039
name and your affiliation

517
00:19:19,669 --> 00:19:18,720
any questions here at ames research

518
00:19:22,830 --> 00:19:19,679
center

519
00:19:26,789 --> 00:19:24,950
front and if they're really hard i

520
00:19:29,029 --> 00:19:26,799
brought my driver because even my driver

521
00:19:30,950 --> 00:19:29,039
can answer the hard questions

522
00:19:32,950 --> 00:19:30,960
not really

523
00:19:35,750 --> 00:19:32,960
doctor it was a very good presentation

524
00:19:37,190 --> 00:19:35,760
thank you very entertaining as well as

525
00:19:39,430 --> 00:19:37,200
educational

526
00:19:40,950 --> 00:19:39,440
i'm krs murthy

527
00:19:42,870 --> 00:19:40,960
president of silicon valley engineering

528
00:19:44,710 --> 00:19:42,880
council council of most all the

529
00:19:47,909 --> 00:19:44,720
engineering professional societies as

530
00:19:49,830 --> 00:19:47,919
well as a solar company ceo

531
00:19:53,110 --> 00:19:49,840
what we need is

532
00:19:54,390 --> 00:19:53,120
a software programmable composite

533
00:19:57,110 --> 00:19:54,400
material

534
00:19:59,830 --> 00:19:57,120
in addition to being a memory ally

535
00:20:01,830 --> 00:19:59,840
memory ally has its limitations

536
00:20:03,909 --> 00:20:01,840
in terms of programmability

537
00:20:06,549 --> 00:20:03,919
and a software programmable

538
00:20:08,870 --> 00:20:06,559

composite would be the ideal one going

539
00:20:10,070 --> 00:20:08,880
forward in terms of materials advanced

540
00:20:12,230 --> 00:20:10,080
materials

541
00:20:15,029 --> 00:20:12,240
any any uh

542
00:20:17,430 --> 00:20:15,039
anything else and in similar aligns that

543
00:20:19,029 --> 00:20:17,440
is there in the advanced materials that

544
00:20:20,390 --> 00:20:19,039
nasa is working on

545
00:20:22,149 --> 00:20:20,400
you know i really am going to refer you

546
00:20:23,669 --> 00:20:22,159
to somebody and i'm going to ask i don't

547
00:20:24,950 --> 00:20:23,679
know whether jay juan has an answer i

548
00:20:26,549 --> 00:20:24,960
don't know the answer to your question

549
00:20:29,110 --> 00:20:26,559
but okay i think what he's what he's

550
00:20:30,549 --> 00:20:29,120
asking is are are any of us working on

551
00:20:32,390 --> 00:20:30,559
on

552
00:20:34,310 --> 00:20:32,400
software yeah

553
00:20:37,029 --> 00:20:34,320
eccentric materials which can be

554
00:20:38,710 --> 00:20:37,039
software programmable

555
00:20:43,190 --> 00:20:38,720
i will throw that question out because i

556
00:20:47,350 --> 00:20:43,990
okay

557
00:20:51,830 --> 00:20:49,909
so what we've done is we've broken the

558
00:20:54,149 --> 00:20:51,840
the program down into three parts a

559
00:20:57,029 --> 00:20:54,159
near-term midterm and longer-term parts

560
00:21:00,149 --> 00:20:57,039
so i think uh uh what mr bolden showed

561
00:21:02,470 --> 00:21:00,159
us this new perseus material is sort of

562
00:21:04,710 --> 00:21:02,480
near-term or midterm the question you

563
00:21:06,470 --> 00:21:04,720

ask is more of a long-term nature a lot

564
00:21:08,950 --> 00:21:06,480
of development time needed

565
00:21:11,270 --> 00:21:08,960
for for such a material system that that

566
00:21:14,149 --> 00:21:11,280
you're that you're talking about

567
00:21:17,430 --> 00:21:14,159
we do have a small effort in nano

568
00:21:20,390 --> 00:21:17,440
materials we do have as far as people

569
00:21:22,310 --> 00:21:20,400
thinking about programming uh

570
00:21:25,270 --> 00:21:22,320
nano material or

571
00:21:27,190 --> 00:21:25,280
or morphing material into shapes via

572
00:21:29,190 --> 00:21:27,200
computer software

573
00:21:31,110 --> 00:21:29,200
i'm not aware of any groups within nasa

574
00:21:34,149 --> 00:21:31,120
that are doing that i know it it's an

575
00:21:36,070 --> 00:21:34,159
emerging area of interest but we don't

576
00:21:38,630 --> 00:21:36,080
have a very large effort in that in that

577
00:21:39,510 --> 00:21:38,640
area any uh any universities represented

578
00:21:41,590 --> 00:21:39,520
here

579
00:21:44,310 --> 00:21:41,600
just out of curiosity

580
00:21:46,950 --> 00:21:44,320
one back there you know i too uh okay at

581
00:21:49,029 --> 00:21:46,960
least i as i said i was at purdue

582
00:21:49,750 --> 00:21:49,039
yesterday and i was um

583
00:22:04,549 --> 00:21:49,760
i

584
00:22:07,110 --> 00:22:04,559
probably gonna come from you know from a

585
00:22:09,350 --> 00:22:07,120
young researcher on a university campus

586
00:22:10,549 --> 00:22:09,360
uh people my age don't even think about

587
00:22:14,149 --> 00:22:10,559
it um

588
00:22:15,830 --> 00:22:14,159

in quite you know to be quite honest um

589
00:22:18,149 --> 00:22:15,840
we have through the office of chief

590
00:22:20,310 --> 00:22:18,159
technology if our budget goes through

591
00:22:22,710 --> 00:22:20,320
the way we want it we want to be able to

592
00:22:24,789 --> 00:22:22,720
award 500

593
00:22:26,390 --> 00:22:24,799
full scholarships for graduate and

594
00:22:28,549 --> 00:22:26,400
postgraduate work in

595
00:22:31,110 --> 00:22:28,559
in technology and technology development

596
00:22:34,149 --> 00:22:31,120
beginning next year and some of you may

597
00:22:35,909 --> 00:22:34,159
have already received queries from us

598
00:22:37,270 --> 00:22:35,919
trying to find out what are the areas

599
00:22:39,029 --> 00:22:37,280
that we need to

600
00:22:40,549 --> 00:22:39,039
you know to award those

601
00:22:42,630 --> 00:22:40,559
in what areas should we award the

602
00:22:44,710 --> 00:22:42,640
scholarships to be relevant to you

603
00:22:46,870 --> 00:22:44,720
because i think if we get as we get more

604
00:22:48,310 --> 00:22:46,880
money back on university campuses we are

605
00:22:50,230 --> 00:22:48,320
going to find the answers to some of the

606
00:22:53,909 --> 00:22:50,240
things you suggest but yeah

607
00:22:55,590 --> 00:22:53,919
okay any questions here at ames here's

608
00:23:00,870 --> 00:22:55,600
one on this side

609
00:23:05,270 --> 00:23:03,830
hi it's tom hickson boeing

610
00:23:07,350 --> 00:23:05,280
i'd just like to hear you speak a little

611
00:23:09,350 --> 00:23:07,360
bit more about the value

612
00:23:10,470 --> 00:23:09,360
long term about partnershiping with

613
00:23:12,470 --> 00:23:10,480

industry

614
00:23:15,029 --> 00:23:12,480
and uh how that

615
00:23:18,310 --> 00:23:15,039
benefits both sides you know

616
00:23:21,029 --> 00:23:18,320
tom is it tom yes i got it right okay

617
00:23:23,110 --> 00:23:21,039
the thing is the way that nasa has come

618
00:23:24,070 --> 00:23:23,120
through the years even from its naka

619
00:23:25,909 --> 00:23:24,080
days

620
00:23:27,110 --> 00:23:25,919
has been an incredible partnership with

621
00:23:29,430 --> 00:23:27,120
industry

622
00:23:31,270 --> 00:23:29,440
some of us have forgotten that and i

623
00:23:33,350 --> 00:23:31,280
think if we look at where we want to go

624
00:23:34,789 --> 00:23:33,360
in the future of human space flight

625
00:23:36,549 --> 00:23:34,799
the only way that we're going to be

626
00:23:38,630 --> 00:23:36,559
successful in doing what president obama

627
00:23:41,430 --> 00:23:38,640
has charged us to do and as he

628
00:23:43,269 --> 00:23:41,440
understands is that if we forge if we

629
00:23:44,310 --> 00:23:43,279
get back to forging that partnership

630
00:23:46,470 --> 00:23:44,320
such that

631
00:23:49,269 --> 00:23:46,480
we work collaboratively with each other

632
00:23:52,230 --> 00:23:49,279
that we share ideas with each other and

633
00:23:54,070 --> 00:23:52,240
that we even when we think of of new

634
00:23:55,190 --> 00:23:54,080
technologies and new ideas we turn to

635
00:23:57,510 --> 00:23:55,200
you

636
00:24:00,070 --> 00:23:57,520
to actually take it through to fruition

637
00:24:02,310 --> 00:24:00,080
because that's not what we do we get in

638
00:24:05,029 --> 00:24:02,320

trouble you know when we try to isolate

639
00:24:07,190 --> 00:24:05,039
our isolate ourselves from industry and

640
00:24:09,430 --> 00:24:07,200
pretend that we do those things

641
00:24:11,830 --> 00:24:09,440
we do need to have engineers who are

642
00:24:14,149 --> 00:24:11,840
capable of going to any manufacturing

643
00:24:16,789 --> 00:24:14,159
floor you know and and overseeing a

644
00:24:19,110 --> 00:24:16,799
project if need be but the partnership

645
00:24:21,110 --> 00:24:19,120
between industry academia and nasa and

646
00:24:22,630 --> 00:24:21,120
our international partners is really

647
00:24:23,669 --> 00:24:22,640
going to be critical we don't see quite

648
00:24:26,149 --> 00:24:23,679
as much of it in the field of

649
00:24:29,190 --> 00:24:26,159
aeronautics because of some export

650
00:24:32,149 --> 00:24:29,200
import laws and the like but even there

651
00:24:33,750 --> 00:24:32,159
jay juan in his travels internationally

652
00:24:34,950 --> 00:24:33,760
we're trying to find better ways that we

653
00:24:36,390 --> 00:24:34,960
can collaborate with some of our

654
00:24:38,950 --> 00:24:36,400
international partners we're able to do

655
00:24:40,789 --> 00:24:38,960
it a little bit better in science than

656
00:24:42,950 --> 00:24:40,799
in anything else but in aeronautics and

657
00:24:44,390 --> 00:24:42,960
even in human space flight

658
00:24:46,310 --> 00:24:44,400
it gets to be difficult sometimes

659
00:24:48,789 --> 00:24:46,320
because of the export laws and

660
00:24:50,630 --> 00:24:48,799
restrictions but the congress and the

661
00:24:51,990 --> 00:24:50,640
president and the secretary of state and

662
00:24:53,430 --> 00:24:52,000
the secretary of defense are working

663
00:24:56,390 --> 00:24:53,440

really hard to get some of those things

664
00:24:58,789 --> 00:24:56,400
eased if not turned off okay hope i

665
00:25:01,029 --> 00:24:58,799
answered your question okay we have time

666
00:25:03,750 --> 00:25:01,039
for one more question

667
00:25:08,070 --> 00:25:05,590
we do not appear to have any questions

668
00:25:10,390 --> 00:25:08,080
on our virtual network either one last

669
00:25:12,470 --> 00:25:10,400
chance here at ames

670
00:25:14,630 --> 00:25:12,480
then i have one question

671
00:25:16,549 --> 00:25:14,640
and and that and it's and it is not a

672
00:25:17,830 --> 00:25:16,559
rhetorical question and that question is

673
00:25:19,590 --> 00:25:17,840
i kind of

674
00:25:23,510 --> 00:25:19,600
implied in my comments is will you all

675
00:25:26,149 --> 00:25:23,520
help us you know um we really need ideas

676
00:25:27,830 --> 00:25:26,159
uh whether it's an arrow or science or a

677
00:25:29,430 --> 00:25:27,840
human space flight

678
00:25:31,590 --> 00:25:29,440
because we don't have a corner on the

679
00:25:35,510 --> 00:25:31,600
market i have an incredibly talented

680
00:25:37,750 --> 00:25:35,520
group of 18 000 plus

681
00:25:39,750 --> 00:25:37,760
young men and women and young i use i'm

682
00:25:42,470 --> 00:25:39,760
young okay

683
00:25:44,789 --> 00:25:42,480
because i feel incredibly young

684
00:25:46,390 --> 00:25:44,799
my body tells me sometimes that you know

685
00:25:48,549 --> 00:25:46,400
don't believe it but

686
00:25:50,310 --> 00:25:48,559
but i i feel young and so when i use the

687
00:25:51,909 --> 00:25:50,320
term young i mean everybody in this room

688
00:25:52,789 --> 00:25:51,919

and everybody who's back at the nasa

689
00:25:54,549 --> 00:25:52,799
centers

690
00:25:57,190 --> 00:25:54,559
we have a lot of ideas but we don't have

691
00:25:57,909 --> 00:25:57,200
a corner on the market on the best ideas

692
00:25:59,830 --> 00:25:57,919
so

693
00:26:01,990 --> 00:25:59,840
we really need for you all to make that

694
00:26:04,310 --> 00:26:02,000
collaboration you know that tom asked

695
00:26:05,909 --> 00:26:04,320
about to make it real

696
00:26:08,470 --> 00:26:05,919
it's one thing to say we want to

697
00:26:10,390 --> 00:26:08,480
collaborate but if you don't come to us

698
00:26:12,310 --> 00:26:10,400
and put demands on us

699
00:26:13,430 --> 00:26:12,320
and tell us what kind of facilities you

700
00:26:14,950 --> 00:26:13,440
need

701
00:26:17,510 --> 00:26:14,960
because we're going through a very

702
00:26:18,789 --> 00:26:17,520
difficult time now in trying to decide

703
00:26:21,669 --> 00:26:18,799
uh you know

704
00:26:23,029 --> 00:26:21,679
what do we have to have in nasa in terms

705
00:26:26,310 --> 00:26:23,039
of infrastructure

706
00:26:28,630 --> 00:26:26,320
we are over subscribed over populated

707
00:26:30,230 --> 00:26:28,640
over everything if you talk to anybody

708
00:26:32,630 --> 00:26:30,240
representing any of these centers here

709
00:26:34,390 --> 00:26:32,640
or you talk to jay juan

710
00:26:36,149 --> 00:26:34,400
we would love to keep everything that we

711
00:26:37,750 --> 00:26:36,159
have because we figure one of these days

712
00:26:39,669 --> 00:26:37,760
somebody's going to need it

713
00:26:41,830 --> 00:26:39,679

well we can't do that

714
00:26:43,990 --> 00:26:41,840
and you all probably know as well as

715
00:26:45,750 --> 00:26:44,000
anybody what you foresee coming down the

716
00:26:47,190 --> 00:26:45,760
road in terms of

717
00:26:49,990 --> 00:26:47,200
technology development and the

718
00:26:50,950 --> 00:26:50,000
facilities that are going to be required

719
00:26:53,510 --> 00:26:50,960
to take

720
00:26:55,269 --> 00:26:53,520
the ideas to fruition so

721
00:26:56,870 --> 00:26:55,279
uh talk to us

722
00:26:59,110 --> 00:26:56,880
you know if there's something that that

723
00:27:01,590 --> 00:26:59,120
you need you need to let us know if

724
00:27:03,110 --> 00:27:01,600
there's something you see no need for uh

725
00:27:05,510 --> 00:27:03,120
particularly in the area of facilities

726
00:27:08,230 --> 00:27:05,520
then let us know uh because it will help

727
00:27:10,230 --> 00:27:08,240
us with our decisions uh that we have to

728
00:27:12,789 --> 00:27:10,240
make in the in the next year to be quite

729
00:27:14,070 --> 00:27:12,799
honest if we're going to be able to fund

730
00:27:15,269 --> 00:27:14,080
the kinds of things that we want to do

731
00:27:16,950 --> 00:27:15,279
in the future but thanks very much for