



1  
00:02:12,070 --> 00:02:09,990  
good afternoon i'm casey swales and

2  
00:02:13,990 --> 00:02:12,080  
welcome to the 2022

3  
00:02:15,990 --> 00:02:14,000  
nasa safety stand down

4  
00:02:18,070 --> 00:02:16,000  
safety and a new era of space

5  
00:02:20,949 --> 00:02:18,080  
exploration

6  
00:02:22,790 --> 00:02:20,959  
as in years past today we observe our

7  
00:02:25,270 --> 00:02:22,800  
annual day of remembrance

8  
00:02:27,830 --> 00:02:25,280  
by taking time out to reflect on the

9  
00:02:30,470 --> 00:02:27,840  
lives of heroes tragically lost in the

10  
00:02:32,869 --> 00:02:30,480  
pursuit of discovery and exploration

11  
00:02:34,309 --> 00:02:32,879  
including the crews of apollo 1

12  
00:02:36,390 --> 00:02:34,319  
and space shuttle's challenger in

13  
00:02:38,630 --> 00:02:36,400

colombia

14

00:02:40,550 --> 00:02:38,640

as said by administrator nelson and

15

00:02:41,750 --> 00:02:40,560

deputy administrator melroy in messages

16

00:02:43,990 --> 00:02:41,760

this week

17

00:02:46,150 --> 00:02:44,000

it's also a time for us to reflect on

18

00:02:48,309 --> 00:02:46,160

the lessons learned from these tragedies

19

00:02:51,350 --> 00:02:48,319

and to remind ourselves of the critical

20

00:02:54,229 --> 00:02:51,360

responsibility each of us has in caring

21

00:02:56,309 --> 00:02:54,239

and safely executing the mission

22

00:02:58,309 --> 00:02:56,319

as we prepare to return humans to the

23

00:02:59,990 --> 00:02:58,319

moon and onto mars

24

00:03:01,589 --> 00:03:00,000

we must continue to embrace our core

25

00:03:03,670 --> 00:03:01,599

value of safety

26

00:03:06,229 --> 00:03:03,680

is both an institutional and an

27

00:03:08,550 --> 00:03:06,239

individual responsibility

28

00:03:10,710 --> 00:03:08,560

and our core value of inclusion reminds

29

00:03:13,030 --> 00:03:10,720

us to ensure that every voice is heard

30

00:03:15,589 --> 00:03:13,040

and every nasa member family feels

31

00:03:16,949 --> 00:03:15,599

comfortable speaking up

32

00:03:19,190 --> 00:03:16,959

our discussion will cover many

33

00:03:21,030 --> 00:03:19,200

insightful and possibly some difficult

34

00:03:24,070 --> 00:03:21,040

topics from experts

35

00:03:25,430 --> 00:03:24,080

but more importantly these leaders

36

00:03:27,270 --> 00:03:25,440

have first-hand professional and

37

00:03:28,789 --> 00:03:27,280

personal experience

38

00:03:31,750 --> 00:03:28,799

and i can't think of anyone better than

39

00:03:34,309 --> 00:03:31,760

this group to discuss today's topic

40

00:03:36,869 --> 00:03:34,319

while they need no introduction

41

00:03:39,830 --> 00:03:36,879

administrator bill nelson

42

00:03:42,229 --> 00:03:39,840

deputy administrator pam melroy

43

00:03:44,630 --> 00:03:42,239

associate administrator bob cabana

44

00:03:47,430 --> 00:03:44,640

all former nasa astronauts

45

00:03:50,309 --> 00:03:47,440

and russ delosh nasa's chief of safety

46

00:03:51,830 --> 00:03:50,319

emission assurance

47

00:03:53,910 --> 00:03:51,840

thank you all for joining us for this

48

00:03:57,509 --> 00:03:53,920

important discussion and now i turn it

49

00:03:57,519 --> 00:04:01,110

thank you casey

50

00:04:06,149 --> 00:04:05,110

this is a solemn day of remembrance

51

00:04:08,390 --> 00:04:06,159

and

52

00:04:09,270 --> 00:04:08,400

we wanted to share with you

53

00:04:12,229 --> 00:04:09,280

what

54

00:04:15,030 --> 00:04:12,239

we have just done we've returned

55

00:04:18,390 --> 00:04:15,040

from arlington cemetery where

56

00:04:21,030 --> 00:04:18,400

pam and bob and i participated

57

00:04:23,430 --> 00:04:21,040

first in the changing the guard

58

00:04:26,390 --> 00:04:23,440

after the changing

59

00:04:29,030 --> 00:04:26,400

then we had a wreath

60

00:04:31,189 --> 00:04:29,040

that the three of us went up to the tomb

61

00:04:34,310 --> 00:04:31,199

of the unknown

62

00:04:36,710 --> 00:04:34,320

and presented that reef and you're

63

00:04:40,830 --> 00:04:36,720

seeing

64

00:04:42,710 --> 00:04:40,840

a picture now of a wreath that then we

65

00:04:44,390 --> 00:04:42,720

placed at

66

00:04:45,350 --> 00:04:44,400

the markers

67

00:04:46,790 --> 00:04:45,360

for

68

00:04:49,110 --> 00:04:46,800

columbia

69

00:04:51,430 --> 00:04:49,120

and for challenger

70

00:04:54,469 --> 00:04:51,440

there are several of the astronauts that

71

00:04:58,070 --> 00:04:54,479

are buried in in the immediate vicinity

72

00:05:05,029 --> 00:05:01,830

each of us spoke briefly

73

00:05:06,310 --> 00:05:05,039

we were joined by friends of one of the

74

00:05:08,790 --> 00:05:06,320

crew

75

00:05:13,749 --> 00:05:08,800

from columbia

76

00:05:15,749 --> 00:05:13,759

and we had them speak as well

77

00:05:18,550 --> 00:05:15,759

general charlie bolden

78

00:05:20,870 --> 00:05:18,560

joined us in the audience

79

00:05:23,749 --> 00:05:20,880

former administrator and former

80

00:05:25,029 --> 00:05:23,759

administrator sean o'keefe

81

00:05:27,430 --> 00:05:25,039

as well

82

00:05:30,550 --> 00:05:27,440

joined us

83

00:05:34,390 --> 00:05:30,560

and then we walked over to another part

84

00:05:36,870 --> 00:05:34,400

of the cemetery where there is the new

85

00:05:40,629 --> 00:05:36,880

apollo 1 marker

86

00:05:43,270 --> 00:05:40,639

and two of the astronauts of the three

87

00:05:46,390 --> 00:05:43,280

are buried there

88

00:05:49,749 --> 00:05:46,400

grissom and chafee

89

00:05:54,390 --> 00:05:49,759

and we had another

90

00:06:01,350 --> 00:05:57,830

as we're walking back

91

00:06:04,390 --> 00:06:01,360

to get into our vehicles

92

00:06:06,870 --> 00:06:04,400

i remembered that john glenn is buried

93

00:06:11,350 --> 00:06:06,880

not far

94

00:06:13,749 --> 00:06:11,360

and so a few steps off of the roadway

95

00:06:15,350 --> 00:06:13,759

of the three of us went over to pay

96

00:06:20,870 --> 00:06:15,360

tribute

97

00:06:27,430 --> 00:06:24,870

it's interesting on his tombstone

98

00:06:28,790 --> 00:06:27,440

he says u.s marine corps

99

00:06:30,309 --> 00:06:28,800

then he says

100

00:06:32,469 --> 00:06:30,319

fighter pilot

101  
00:06:34,870 --> 00:06:32,479  
says astronaut

102  
00:06:37,670 --> 00:06:34,880  
and senator

103  
00:06:43,029 --> 00:06:37,680  
i think of all those uh the marine corps

104  
00:06:49,510 --> 00:06:46,830  
it's a solemn day it's a sad day but it

105  
00:06:51,029 --> 00:06:49,520  
is a day

106  
00:06:53,029 --> 00:06:51,039  
for us

107  
00:06:56,629 --> 00:06:53,039  
to remember

108  
00:06:58,469 --> 00:06:56,639  
not only these wonderful people

109  
00:07:02,790 --> 00:06:58,479  
and to remember them

110  
00:07:04,230 --> 00:07:02,800  
as the vibrant people that they were

111  
00:07:07,990 --> 00:07:04,240  
but also

112  
00:07:09,270 --> 00:07:08,000  
for us to remember the lessons

113  
00:07:10,550 --> 00:07:09,280

that we

114

00:07:12,710 --> 00:07:10,560

should

115

00:07:15,670 --> 00:07:12,720

learn

116

00:07:18,950 --> 00:07:15,680

from those accidents because

117

00:07:22,710 --> 00:07:18,960

mistakes human mistakes

118

00:07:29,430 --> 00:07:26,710

and since we live in such a

119

00:07:32,150 --> 00:07:29,440

high risk

120

00:07:35,670 --> 00:07:32,160

high charged environment

121

00:07:37,110 --> 00:07:35,680

where so many things are just right on

122

00:07:43,110 --> 00:07:37,120

the line and

123

00:07:48,469 --> 00:07:45,589

it proves that

124

00:07:51,430 --> 00:07:48,479

the impossible becomes possible

125

00:07:53,990 --> 00:07:51,440

but it's not without risk

126  
00:07:54,790 --> 00:07:54,000  
and that's what we want to minimize and

127  
00:07:56,469 --> 00:07:54,800  
so

128  
00:07:59,990 --> 00:07:56,479  
the three of us

129  
00:08:03,350 --> 00:08:00,000  
want to share with you

130  
00:08:05,749 --> 00:08:03,360  
some of the experiences that we've had

131  
00:08:11,749 --> 00:08:05,759  
over the course of remembering back

132  
00:08:18,469 --> 00:08:14,150  
i was on hoot gibson's crew which was

133  
00:08:22,230 --> 00:08:18,479  
the 24th flight of the space shuttle

134  
00:08:24,309 --> 00:08:22,240  
we uh still have the

135  
00:08:26,230 --> 00:08:24,319  
record uh

136  
00:08:29,350 --> 00:08:26,240  
not enviable

137  
00:08:31,189 --> 00:08:29,360  
of the most delays and the most scrubs

138  
00:08:33,350 --> 00:08:31,199

for

139

00:08:36,070 --> 00:08:33,360

but the reason i mentioned that

140

00:08:38,870 --> 00:08:36,080

we were supposed to go in december

141

00:08:41,269 --> 00:08:38,880

of 1985.

142

00:08:46,070 --> 00:08:41,279

we didn't get off the ground until the

143

00:08:48,150 --> 00:08:46,080

12th of january landing on the 18th

144

00:08:50,949 --> 00:08:48,160

and of course

145

00:08:55,750 --> 00:08:50,959

you remember what happened on the 28th

146

00:09:01,430 --> 00:08:57,990

there are lessons learned

147

00:09:04,949 --> 00:09:01,440

when the rogers commission

148

00:09:08,550 --> 00:09:04,959

named after secretary of state rogers

149

00:09:10,790 --> 00:09:08,560

went in and did the examination and they

150

00:09:13,509 --> 00:09:10,800

in fact

151  
00:09:16,949 --> 00:09:13,519  
had such luminaries as neil armstrong on

152  
00:09:22,550 --> 00:09:18,790  
what they concluded that a number of

153  
00:09:24,949 --> 00:09:22,560  
mistakes had been made

154  
00:09:28,470 --> 00:09:24,959  
they pointed for example

155  
00:09:29,829 --> 00:09:28,480  
to the second scrub that we had on the

156  
00:09:33,750 --> 00:09:29,839  
flight

157  
00:09:35,670 --> 00:09:33,760  
back a scrub in early january

158  
00:09:38,870 --> 00:09:35,680  
in which

159  
00:09:42,150 --> 00:09:38,880  
someone had overridden the computer and

160  
00:09:45,430 --> 00:09:42,160  
started to drain out 18 000 pounds of

161  
00:09:51,670 --> 00:09:49,269  
and an alert supervisor caught it that

162  
00:09:52,710 --> 00:09:51,680  
the lox line was too

163  
00:09:55,990 --> 00:09:52,720

cold

164

00:09:58,150 --> 00:09:56,000

and stopped the count at t minus 31. the

165

00:09:59,750 --> 00:09:58,160

rogers commission

166

00:10:03,269 --> 00:09:59,760

noted that

167

00:10:05,910 --> 00:10:03,279

because they thought that fatigue

168

00:10:09,509 --> 00:10:05,920

had played a part

169

00:10:11,990 --> 00:10:10,389

let's

170

00:10:13,269 --> 00:10:12,000

keep that in mind

171

00:10:15,110 --> 00:10:13,279

not to be

172

00:10:17,269 --> 00:10:15,120

so fatigued

173

00:10:19,190 --> 00:10:17,279

that at critical moments of decision

174

00:10:23,430 --> 00:10:19,200

making

175

00:10:27,030 --> 00:10:25,030

but then look what happened to

176  
00:10:29,430 --> 00:10:27,040  
challenger

177  
00:10:31,590 --> 00:10:29,440  
they got down to

178  
00:10:33,190 --> 00:10:31,600  
the night before

179  
00:10:36,150 --> 00:10:33,200  
the weather

180  
00:10:37,990 --> 00:10:36,160  
has now gone down to 25 degrees

181  
00:10:40,069 --> 00:10:38,000  
fahrenheit

182  
00:10:44,069 --> 00:10:40,079  
there are icicles

183  
00:10:44,949 --> 00:10:44,079  
hanging on the launch tower

184  
00:10:49,430 --> 00:10:44,959  
and

185  
00:10:51,990 --> 00:10:49,440  
coming out

186  
00:10:54,470 --> 00:10:52,000  
and they don't have on their top coats

187  
00:10:55,670 --> 00:10:54,480  
because they went from crew quarters

188  
00:10:58,630 --> 00:10:55,680

there right

189

00:11:02,310 --> 00:10:58,640

into that crew van

190

00:11:05,750 --> 00:11:02,320

but it was 25 degrees the night before

191

00:11:06,949 --> 00:11:05,760

at this point it's probably about 29

192

00:11:09,750 --> 00:11:06,959

degrees

193

00:11:14,069 --> 00:11:09,760

by the time that they finally launched

194

00:11:17,430 --> 00:11:14,079

it was 36 degrees

195

00:11:22,790 --> 00:11:20,150

the rubberized gaskets

196

00:11:24,870 --> 00:11:22,800

in the field joints of the

197

00:11:27,430 --> 00:11:24,880

solid rocket boosters

198

00:11:30,710 --> 00:11:27,440

called o-rings

199

00:11:33,110 --> 00:11:30,720

that cold weather the night before had

200

00:11:35,430 --> 00:11:33,120

stiffened them

201  
00:11:36,870 --> 00:11:35,440  
and so as challenger

202  
00:11:39,509 --> 00:11:36,880  
launched

203  
00:11:42,710 --> 00:11:39,519  
and those hot gases

204  
00:11:46,710 --> 00:11:42,720  
expanded out the field joint and hit

205  
00:11:52,310 --> 00:11:46,720  
right into the external tank

206  
00:11:52,320 --> 00:11:57,670  
the external tank blew

207  
00:12:05,430 --> 00:12:01,190  
their lessons learned from that

208  
00:12:09,430 --> 00:12:05,440  
because the night before back in utah

209  
00:12:11,990 --> 00:12:09,440  
the engineers of morton thigh call

210  
00:12:15,110 --> 00:12:12,000  
they were telling their management stop

211  
00:12:15,120 --> 00:12:19,670  
it's the o-rings it's cold

212  
00:12:25,110 --> 00:12:22,710  
later on in another investigation i

213  
00:12:27,430 --> 00:12:25,120

talked to one of the engineers in that

214

00:12:31,350 --> 00:12:27,440

investigation

215

00:12:34,150 --> 00:12:31,360

and i said how were you alerted to know

216

00:12:35,990 --> 00:12:34,160

that it was potentially a problem on

217

00:12:38,629 --> 00:12:36,000

your earrings other than your

218

00:12:40,230 --> 00:12:38,639

engineering expertise

219

00:12:42,310 --> 00:12:40,240

and he said

220

00:12:44,629 --> 00:12:42,320

it was when we got back

221

00:12:46,629 --> 00:12:44,639

your columbia

222

00:12:48,230 --> 00:12:46,639

the 24th flights

223

00:12:50,230 --> 00:12:48,240

o-rings

224

00:12:52,790 --> 00:12:50,240

and the solid rocket boosters we saw

225

00:12:53,990 --> 00:12:52,800

that there was by and you actually

226  
00:12:58,150 --> 00:12:54,000  
launched

227  
00:13:01,430 --> 00:12:58,160  
in a relatively warm

228  
00:13:04,470 --> 00:13:01,440  
54 degrees and there were still

229  
00:13:09,990 --> 00:13:07,509  
and we said

230  
00:13:12,150 --> 00:13:10,000  
that's interesting that happened

231  
00:13:15,829 --> 00:13:12,160  
a previous year

232  
00:13:18,310 --> 00:13:15,839  
and what was the month it was january

233  
00:13:22,629 --> 00:13:18,320  
what's common to january

234  
00:13:28,790 --> 00:13:26,150  
but the management didn't listen

235  
00:13:31,910 --> 00:13:28,800  
and it went all the way up

236  
00:13:36,470 --> 00:13:31,920  
the chain of command

237  
00:13:38,389 --> 00:13:36,480  
it went up to people at the very top i'm

238  
00:13:43,269 --> 00:13:38,399

going to tell you one more thing that's

239

00:13:49,030 --> 00:13:45,910

jim beggs

240

00:13:51,030 --> 00:13:49,040

the administrator of nasa just a week

241

00:13:54,389 --> 00:13:51,040

before

242

00:13:55,829 --> 00:13:54,399

had been indicted by a federal grand

243

00:14:00,550 --> 00:13:55,839

jury

244

00:14:07,110 --> 00:14:04,230

and he was sure that he could clear his

245

00:14:09,110 --> 00:14:07,120

name quickly by getting

246

00:14:10,389 --> 00:14:09,120

the evidence out of the department of

247

00:14:12,550 --> 00:14:10,399

defense

248

00:14:15,750 --> 00:14:12,560

by the way it took him two years to do

249

00:14:25,110 --> 00:14:19,670

the prosecution dropped the case

250

00:14:27,110 --> 00:14:25,120

but not on that day of january 28th

251  
00:14:30,629 --> 00:14:27,120  
jim beggs

252  
00:14:33,030 --> 00:14:30,639  
now no longer administrator

253  
00:14:35,430 --> 00:14:33,040  
is still in his office

254  
00:14:40,150 --> 00:14:35,440  
back at headquarters and he's looking at

255  
00:14:42,230 --> 00:14:40,160  
the nasa tv and he's seeing the icicles

256  
00:14:46,470 --> 00:14:42,240  
and he's calling the cape

257  
00:14:53,509 --> 00:14:48,949  
and they wouldn't take his call

258  
00:15:00,069 --> 00:14:56,949  
one thing after another

259  
00:15:02,470 --> 00:15:00,079  
very prominent people

260  
00:15:04,310 --> 00:15:02,480  
in nasa's history back in the apollo

261  
00:15:07,030 --> 00:15:04,320  
program

262  
00:15:12,069 --> 00:15:07,040  
were asked about their opinion

263  
00:15:12,079 --> 00:15:15,829

there's always risk

264

00:15:21,750 --> 00:15:19,350

but there's always safety

265

00:15:23,829 --> 00:15:21,760

you have to balance that risk and the

266

00:15:27,030 --> 00:15:23,839

safety

267

00:15:29,990 --> 00:15:27,040

and for an experienced that is so

268

00:15:31,829 --> 00:15:30,000

personal to me we had trained with the

269

00:15:34,069 --> 00:15:31,839

challenger crew

270

00:15:36,629 --> 00:15:34,079

since we were so late getting off the

271

00:15:38,389 --> 00:15:36,639

ground after four scrubs

272

00:15:39,430 --> 00:15:38,399

they were actually at the cape doing

273

00:15:41,509 --> 00:15:39,440

their

274

00:15:43,030 --> 00:15:41,519

practice countdown they stayed with us

275

00:15:46,310 --> 00:15:43,040

in crew quarters when we were in

276

00:15:51,590 --> 00:15:49,110

there's always risk

277

00:15:52,829 --> 00:15:51,600

you have to balance that risk

278

00:15:56,470 --> 00:15:52,839

with

279

00:15:57,990 --> 00:15:56,480

safety and so this day of remembrance i

280

00:15:59,430 --> 00:15:58,000

hope

281

00:16:03,990 --> 00:15:59,440

for all

282

00:16:07,030 --> 00:16:04,000

of our wonderful folks in nasa

283

00:16:10,550 --> 00:16:07,040

will be another day of reflection

284

00:16:15,509 --> 00:16:10,560

not only on these great people

285

00:16:19,269 --> 00:16:17,430

bob tell us about some of your

286

00:16:19,990 --> 00:16:19,279

experiences

287

00:16:22,069 --> 00:16:20,000

so

288

00:16:24,230 --> 00:16:22,079

i'll try and be a little brief because i

289

00:16:26,310 --> 00:16:24,240

want to leave time for a discussion but

290

00:16:27,990 --> 00:16:26,320

i want to talk a little bit about the uh

291

00:16:30,069 --> 00:16:28,000

the columbia crew

292

00:16:32,470 --> 00:16:30,079

and there's a picture i'd like you to

293

00:16:34,870 --> 00:16:32,480

put up they've got it on there and i

294

00:16:37,110 --> 00:16:34,880

want to personalize these people for you

295

00:16:40,550 --> 00:16:37,120

when we talk about these crews a lot of

296

00:16:42,550 --> 00:16:40,560

folks are new to nasa but these are moms

297

00:16:44,389 --> 00:16:42,560

and dads sons and daughters

298

00:16:45,829 --> 00:16:44,399

they're they're our friends

299

00:16:47,670 --> 00:16:45,839

and uh

300

00:16:50,790 --> 00:16:47,680

you know

301  
00:16:52,870 --> 00:16:50,800  
it's really important that we know who

302  
00:16:55,030 --> 00:16:52,880  
it is we're putting on these vehicles

303  
00:16:56,629 --> 00:16:55,040  
and that we make sure that we are making

304  
00:16:57,910 --> 00:16:56,639  
the right decisions

305  
00:16:59,829 --> 00:16:57,920  
when we do it

306  
00:17:01,030 --> 00:16:59,839  
if i could get that picture up because i

307  
00:17:02,949 --> 00:17:01,040  
want to talk a little bit about each

308  
00:17:04,549 --> 00:17:02,959  
crew member and i want to i want to show

309  
00:17:07,829 --> 00:17:04,559  
you something

310  
00:17:10,309 --> 00:17:07,839  
obviously that's not the crew

311  
00:17:13,029 --> 00:17:10,319  
hey much younger bob cabana

312  
00:17:15,750 --> 00:17:13,039  
it is a nice picture of you

313  
00:17:16,829 --> 00:17:15,760

but this is the uh this is the columbia

314

00:17:18,710 --> 00:17:16,839

crew

315

00:17:20,870 --> 00:17:18,720

sts-107 and

316

00:17:22,549 --> 00:17:20,880

this was my first flight as the director

317

00:17:25,110 --> 00:17:22,559

of flight crew operations i think the

318

00:17:27,189 --> 00:17:25,120

hardest job i've ever had is being a

319

00:17:28,470 --> 00:17:27,199

family escort when i was an astronaut

320

00:17:30,549 --> 00:17:28,480

standing on the roof of the launch

321

00:17:33,190 --> 00:17:30,559

control center with

322

00:17:34,789 --> 00:17:33,200

holding a two-year-old next to

323

00:17:36,310 --> 00:17:34,799

one of your best friend's wives watching

324

00:17:37,990 --> 00:17:36,320

five to seven of your close friends go

325

00:17:39,510 --> 00:17:38,000

off in that ball of flame it's a

326

00:17:41,830 --> 00:17:39,520

challenge

327

00:17:45,270 --> 00:17:43,750

if you look at rick husband there on the

328

00:17:47,669 --> 00:17:45,280

on the lower left rick was one of the

329

00:17:50,150 --> 00:17:47,679

finest christian men i've ever known

330

00:17:53,830 --> 00:17:50,160

just a really competent air force test

331

00:17:55,190 --> 00:17:53,840

pilot and a really nice man behind him

332

00:17:57,110 --> 00:17:55,200

you got

333

00:17:58,789 --> 00:17:57,120

you know dave brown dave brown was not

334

00:18:00,390 --> 00:17:58,799

only a naval aviator he was a flight

335

00:18:01,669 --> 00:18:00,400

surgeon in the navy

336

00:18:03,590 --> 00:18:01,679

and uh

337

00:18:05,350 --> 00:18:03,600

i used to whenever i needed a new tv or

338

00:18:07,990 --> 00:18:05,360

a stereo system i went to dave because

339

00:18:10,310 --> 00:18:08,000

he was the expert on all that stuff

340

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

next to dave is laurel clark laura clark

341

00:18:14,230 --> 00:18:12,480

was a flight surgeon in the navy and

342

00:18:16,870 --> 00:18:14,240

probably one of the most positive people

343

00:18:18,310 --> 00:18:16,880

i've ever met she always had a smile she

344

00:18:20,230 --> 00:18:18,320

knew when you were down and she'd cheer

345

00:18:23,430 --> 00:18:20,240

you up and pick you up

346

00:18:25,669 --> 00:18:23,440

kulpner koultner was an amazing

347

00:18:27,510 --> 00:18:25,679

scientist engineer

348

00:18:30,230 --> 00:18:27,520

hard working

349

00:18:32,150 --> 00:18:30,240

and just just a great personality great

350

00:18:34,549 --> 00:18:32,160

person

351

00:18:36,230 --> 00:18:34,559

behind kultner there mike brown air

352

00:18:39,350 --> 00:18:36,240

force test pilot

353

00:18:41,990 --> 00:18:39,360

loved his audi tt just one of the nicest

354

00:18:45,029 --> 00:18:42,000

guys you'd ever want to meet

355

00:18:47,830 --> 00:18:45,039

in front of him willie mccoool willie was

356

00:18:48,549 --> 00:18:47,840

second in his class at the naval academy

357

00:18:49,750 --> 00:18:48,559

and

358

00:18:51,750 --> 00:18:49,760

one of the most

359

00:18:53,510 --> 00:18:51,760

competent test pilots i've ever known

360

00:18:56,470 --> 00:18:53,520

but you'd never know it talking to him

361

00:18:58,150 --> 00:18:56,480

he was just a mild-mannered nice guy and

362

00:18:59,430 --> 00:18:58,160

and on the far right there on the end

363

00:19:02,630 --> 00:18:59,440

alon ramon

364

00:19:05,990 --> 00:19:02,640

uh the first israeli to fly in space uh

365

00:19:07,190 --> 00:19:06,000

just another super nice guy

366

00:19:09,110 --> 00:19:07,200

and then you look down there on the

367

00:19:11,029 --> 00:19:09,120

lower left in that picture

368

00:19:13,029 --> 00:19:11,039

and you see columbia

369

00:19:15,110 --> 00:19:13,039

laid out in pieces as they started to

370

00:19:16,789 --> 00:19:15,120

accumulate back at the cape

371

00:19:18,549 --> 00:19:16,799

after one of the largest recovery

372

00:19:19,830 --> 00:19:18,559

efforts ever

373

00:19:22,470 --> 00:19:19,840

and

374

00:19:25,190 --> 00:19:22,480

the reason i put this up here is i want

375

00:19:27,270 --> 00:19:25,200

folks to see the consequences of the

376

00:19:29,110 --> 00:19:27,280

decisions that we make

377

00:19:30,230 --> 00:19:29,120

and i will tell you right now

378

00:19:32,310 --> 00:19:30,240

everybody

379

00:19:34,789 --> 00:19:32,320

that made decisions related to any of

380

00:19:37,350 --> 00:19:34,799

these accidents did not make that

381

00:19:39,750 --> 00:19:37,360

decision thinking that they were causing

382

00:19:42,470 --> 00:19:39,760

that it would result in causing harm to

383

00:19:44,950 --> 00:19:42,480

anyone all right but our decisions have

384

00:19:46,230 --> 00:19:44,960

consequences and that's why it is so

385

00:19:47,909 --> 00:19:46,240

important

386

00:19:49,190 --> 00:19:47,919

that we

387

00:19:51,110 --> 00:19:49,200

have

388

00:19:53,270 --> 00:19:51,120

all the knowledge that we can possibly

389

00:19:55,830 --> 00:19:53,280

have when we make our decisions that

390

00:19:58,310 --> 00:19:55,840

their decisions are based on the best

391

00:20:01,350 --> 00:19:58,320

data possible and the only way we can do

392

00:20:03,750 --> 00:20:01,360

that is if everybody has a voice

393

00:20:05,029 --> 00:20:03,760

we have to create an environment where

394

00:20:07,029 --> 00:20:05,039

everyone

395

00:20:08,950 --> 00:20:07,039

participates in you can take the picture

396

00:20:11,430 --> 00:20:08,960

down now and we'll just talk

397

00:20:12,630 --> 00:20:11,440

but i think it's really important

398

00:20:14,789 --> 00:20:12,640

that

399

00:20:17,029 --> 00:20:14,799

when you are running a meeting

400

00:20:17,990 --> 00:20:17,039

everybody has to have a voice at the

401  
00:20:19,110 --> 00:20:18,000  
table

402  
00:20:21,350 --> 00:20:19,120  
everybody

403  
00:20:23,669 --> 00:20:21,360  
needs to be listened to not heard but

404  
00:20:25,990 --> 00:20:23,679  
listen to all right

405  
00:20:28,630 --> 00:20:26,000  
and that's the way we get the best data

406  
00:20:29,830 --> 00:20:28,640  
to make informed decisions

407  
00:20:32,870 --> 00:20:29,840  
so

408  
00:20:34,390 --> 00:20:32,880  
it's up to us as leaders to ensure that

409  
00:20:36,149 --> 00:20:34,400  
we're encouraging

410  
00:20:38,710 --> 00:20:36,159  
that discussion

411  
00:20:40,390 --> 00:20:38,720  
that everybody has a voice

412  
00:20:43,590 --> 00:20:40,400  
that we have a diverse

413  
00:20:47,029 --> 00:20:43,600

team so that we get the best data to

414

00:20:48,390 --> 00:20:47,039

make an informed decision

415

00:20:49,510 --> 00:20:48,400

so i don't ever want to have to go

416

00:20:51,830 --> 00:20:49,520

through

417

00:20:55,350 --> 00:20:51,840

another columbia and if you look at you

418

00:20:57,110 --> 00:20:55,360

know from 67 to 86

419

00:21:03,270 --> 00:20:57,120

was 19 years

420

00:21:06,789 --> 00:21:03,280

from 86 to 2003 was 17 years from 2003

421

00:21:08,470 --> 00:21:06,799

until now it's 19 years all right we're

422

00:21:10,230 --> 00:21:08,480

in that same time frame well why is that

423

00:21:11,750 --> 00:21:10,240

well we've had a huge turnover in our

424

00:21:14,310 --> 00:21:11,760

personnel we have new people we have

425

00:21:16,390 --> 00:21:14,320

different people in leadership positions

426

00:21:19,110 --> 00:21:16,400

i don't want to forget the lessons

427

00:21:21,270 --> 00:21:19,120

learned from the past okay and we're in

428

00:21:23,430 --> 00:21:21,280

a time of great change right now we're

429

00:21:25,110 --> 00:21:23,440

building new spacecraft i don't want to

430

00:21:27,510 --> 00:21:25,120

see as complacent with the commercial

431

00:21:31,990 --> 00:21:27,520

crew vehicles that we're flying we have

432

00:21:34,070 --> 00:21:32,000

to pay attention all the time every year

433

00:21:35,909 --> 00:21:34,080

this time i dig out my copy of the

434

00:21:37,350 --> 00:21:35,919

columbra report and it's kind of falling

435

00:21:39,750 --> 00:21:37,360

apart i got it clipped together in the

436

00:21:42,070 --> 00:21:39,760

middle but i've got all the key sections

437

00:21:44,549 --> 00:21:42,080

highlighted and i've got notes that i've

438

00:21:45,590 --> 00:21:44,559

taken and i refresh myself i want to

439

00:21:48,870 --> 00:21:45,600

make sure

440

00:21:52,070 --> 00:21:48,880

that we are doing the right thing

441

00:21:56,789 --> 00:21:53,830

thank you bob i

442

00:21:59,750 --> 00:21:56,799

i'd like to talk about some of the

443

00:22:02,950 --> 00:21:59,760

aspects of culture that i've observed

444

00:22:06,390 --> 00:22:02,960

and really appreciated and learned from

445

00:22:09,110 --> 00:22:06,400

i want to talk about my uh first job in

446

00:22:12,149 --> 00:22:09,120

the astronaut office after i graduated i

447

00:22:13,909 --> 00:22:12,159

was a caped crusader and a cape crusader

448

00:22:16,390 --> 00:22:13,919

is someone who helps prepare the shuttle

449

00:22:18,390 --> 00:22:16,400

cockpit for the crew helps strap them in

450

00:22:20,710 --> 00:22:18,400

as a part of the closeout crew

451

00:22:23,270 --> 00:22:20,720

uh and in fact uh as a part of that

452

00:22:25,630 --> 00:22:23,280

closeout crew you're also responsible

453

00:22:28,310 --> 00:22:25,640

for rescuing the crew if they become

454

00:22:29,510 --> 00:22:28,320

incapacitated inside the shuttle

455

00:22:37,190 --> 00:22:29,520

and

456

00:22:40,230 --> 00:22:37,200

my good friends who called themselves

457

00:22:42,310 --> 00:22:40,240

pad rats they made me an honorary pad

458

00:22:43,510 --> 00:22:42,320

rat eventually and gave me a hat to

459

00:22:47,590 --> 00:22:43,520

prove it

460

00:22:48,470 --> 00:22:47,600

were talking to me about cruise rescue

461

00:22:50,070 --> 00:22:48,480

and

462

00:22:51,669 --> 00:22:50,080

they pointed out

463

00:22:55,750 --> 00:22:51,679

a locker

464

00:22:57,430 --> 00:22:55,760

right at the end of the the the

465

00:22:59,590 --> 00:22:57,440

area where the crew walks out to the

466

00:23:00,630 --> 00:22:59,600

vehicle and it's right there

467

00:23:04,710 --> 00:23:00,640

and

468

00:23:07,350 --> 00:23:04,720

door

469

00:23:09,990 --> 00:23:07,360

and told the story that

470

00:23:12,710 --> 00:23:10,000

for apollo 1

471

00:23:14,630 --> 00:23:12,720

when the fire occurred i think people

472

00:23:16,070 --> 00:23:14,640

have are familiar with the story of the

473

00:23:20,870 --> 00:23:16,080

fact that

474

00:23:25,990 --> 00:23:23,750

it hoped opened inward there was so much

475

00:23:28,390 --> 00:23:26,000

pressure they couldn't they couldn't get

476

00:23:30,710 --> 00:23:28,400

into the vehicle after the fire

477

00:23:32,630 --> 00:23:30,720

uh the truth is the crew would not have

478

00:23:35,350 --> 00:23:32,640

survived i think you know

479

00:23:36,549 --> 00:23:35,360

maybe if they had been able to open the

480

00:23:38,549 --> 00:23:36,559

the hatch

481

00:23:39,510 --> 00:23:38,559

it all happened very fast

482

00:23:41,590 --> 00:23:39,520

but

483

00:23:42,789 --> 00:23:41,600

one of the stories that's probably less

484

00:23:45,430 --> 00:23:42,799

well known

485

00:23:48,149 --> 00:23:45,440

is that in their

486

00:23:50,950 --> 00:23:48,159

hurry to try to get inside that hatch

487

00:23:53,430 --> 00:23:50,960

they went to the safety locker where all

488

00:23:55,830 --> 00:23:53,440

the safety equipment was stowed pry bars

489

00:23:58,470 --> 00:23:55,840

and things like that and it was locked

490

00:24:00,470 --> 00:23:58,480

and nobody at the pad knew where the key

491

00:24:01,510 --> 00:24:00,480

was or how to get in it

492

00:24:03,430 --> 00:24:01,520

and so

493

00:24:07,830 --> 00:24:03,440

um

494

00:24:10,549 --> 00:24:07,840

almost 30 years later this was 1996

495

00:24:13,350 --> 00:24:10,559

they remembered that story and they said

496

00:24:16,149 --> 00:24:13,360

this locker is never locked

497

00:24:18,549 --> 00:24:16,159

it's always open for you know any kind

498

00:24:20,630 --> 00:24:18,559

of an emergency and i just really took

499

00:24:23,990 --> 00:24:20,640

that on board and went wow

500

00:24:25,909 --> 00:24:24,000

i mean they remember and they know why

501  
00:24:27,350 --> 00:24:25,919  
you know as test pilots we we have a

502  
00:24:29,590 --> 00:24:27,360  
saying there's a lot of procedures

503  
00:24:31,350 --> 00:24:29,600  
written in blood it's things that we've

504  
00:24:34,710 --> 00:24:31,360  
learned because we've learned the hard

505  
00:24:37,909 --> 00:24:34,720  
way and uh and it really resonated with

506  
00:24:38,789 --> 00:24:37,919  
me and so uh shortly after that when i

507  
00:24:44,630 --> 00:24:38,799  
was

508  
00:24:47,350 --> 00:24:44,640  
a silver snoopy uh and a manager of the

509  
00:24:49,590 --> 00:24:47,360  
person who i gave the snoopy to said

510  
00:24:52,149 --> 00:24:49,600  
have you been out to pad 34

511  
00:24:54,070 --> 00:24:52,159  
and i said no no but i'm you know i've

512  
00:24:57,269 --> 00:24:54,080  
heard this story from the

513  
00:24:58,549 --> 00:24:57,279

uh the rescue folks and so he took me

514

00:25:01,430 --> 00:24:58,559

out there

515

00:25:03,190 --> 00:25:01,440

and uh i was reflecting on it today when

516

00:25:05,430 --> 00:25:03,200

we were at arlington because it feels

517

00:25:07,909 --> 00:25:05,440

like hallowed ground to me and that's i

518

00:25:10,870 --> 00:25:07,919

had that same feeling at arlington

519

00:25:14,070 --> 00:25:10,880

and uh and i just felt this really

520

00:25:16,950 --> 00:25:14,080

profound connection uh out at that pad

521

00:25:18,950 --> 00:25:16,960

and always used to after every launch

522

00:25:21,909 --> 00:25:18,960

where i worked as a cape crusader i

523

00:25:24,789 --> 00:25:21,919

would go out to pad 34 and let the guys

524

00:25:26,789 --> 00:25:24,799

know we'd had a good launch and the crew

525

00:25:29,590 --> 00:25:26,799

was safely in space

526

00:25:32,230 --> 00:25:29,600

so that that really stuck with me but i

527

00:25:34,230 --> 00:25:32,240

think um

528

00:25:37,510 --> 00:25:34,240

as i reflect on the things that we've

529

00:25:39,190 --> 00:25:37,520

learned for example for challenger

530

00:25:39,990 --> 00:25:39,200

um

531

00:25:45,029 --> 00:25:40,000

the

532

00:25:47,430 --> 00:25:45,039

crew from that mishap

533

00:25:49,510 --> 00:25:47,440

but we had a culture to say

534

00:25:53,110 --> 00:25:49,520

what are all the things that we can do

535

00:25:54,390 --> 00:25:53,120

to help protect the crew better and so

536

00:25:56,870 --> 00:25:54,400

after that

537

00:25:58,230 --> 00:25:56,880

astronauts wore pressure suits and we

538

00:26:01,190 --> 00:25:58,240

trained for

539

00:26:03,590 --> 00:26:01,200

uh evacuation wearing those suits there

540

00:26:06,630 --> 00:26:03,600

were hundreds of steps that were taken

541

00:26:09,110 --> 00:26:06,640

on the space shuttle not directly part

542

00:26:11,430 --> 00:26:09,120

of the cause of the challenger mishap

543

00:26:12,390 --> 00:26:11,440

but things that we knew would make the

544

00:26:15,269 --> 00:26:12,400

crew

545

00:26:17,110 --> 00:26:15,279

safer and make the situation more

546

00:26:18,070 --> 00:26:17,120

survivable

547

00:26:22,510 --> 00:26:18,080

and

548

00:26:25,190 --> 00:26:22,520

bob showed a picture of the

549

00:26:27,669 --> 00:26:25,200

reconstruction of colombia

550

00:26:29,669 --> 00:26:27,679

well as a result of that reconstruction

551  
00:26:33,190 --> 00:26:29,679  
where we had pieces of the vehicle that

552  
00:26:36,830 --> 00:26:33,200  
we could go back and do an analysis

553  
00:26:39,190 --> 00:26:36,840  
we did the first ever crew survival

554  
00:26:41,750 --> 00:26:39,200  
investigation previously

555  
00:26:44,149 --> 00:26:41,760  
it it really was very focused on the

556  
00:26:47,350 --> 00:26:44,159  
cause of the mishap but this was a

557  
00:26:49,430 --> 00:26:47,360  
dedicated survival investigation to say

558  
00:26:50,149 --> 00:26:49,440  
what how did everything work how did

559  
00:26:57,350 --> 00:26:50,159  
their

560  
00:26:58,549 --> 00:26:57,360  
not directly related to the cause of the

561  
00:27:01,190 --> 00:26:58,559  
mishap

562  
00:27:02,710 --> 00:27:01,200  
but making things safer and what was

563  
00:27:03,750 --> 00:27:02,720

really important

564

00:27:07,590 --> 00:27:03,760

is that

565

00:27:10,149 --> 00:27:07,600

we nasa sent a copy to every company at

566

00:27:12,470 --> 00:27:10,159

first every country engaged in human

567

00:27:15,350 --> 00:27:12,480

space flight but also

568

00:27:18,149 --> 00:27:15,360

if you think back 2008 that was sort of

569

00:27:20,149 --> 00:27:18,159

the beginning of a lot of commercial

570

00:27:21,750 --> 00:27:20,159

activities right there were a lot of

571

00:27:24,149 --> 00:27:21,760

companies just starting to talk about

572

00:27:26,710 --> 00:27:24,159

commercial human space flight anyone who

573

00:27:30,470 --> 00:27:26,720

ever talked about it we sent him a copy

574

00:27:32,149 --> 00:27:30,480

and i think you know as i i reflect on

575

00:27:32,870 --> 00:27:32,159

you know what does that culture mean to

576

00:27:35,990 --> 00:27:32,880

me

577

00:27:39,430 --> 00:27:36,000

i think uh it's that we

578

00:27:40,149 --> 00:27:39,440

uh learn everything we can to make uh

579

00:27:48,310 --> 00:27:40,159

the

580

00:27:50,149 --> 00:27:48,320

five things that that that were involved

581

00:27:51,750 --> 00:27:50,159

in the mishap

582

00:27:54,310 --> 00:27:51,760

but to really have a culture of saying

583

00:27:56,389 --> 00:27:54,320

let's let's look at everything that

584

00:27:58,950 --> 00:27:56,399

could affect the safety of the crew and

585

00:27:59,990 --> 00:27:58,960

let's think about it even if nothing's

586

00:28:03,350 --> 00:28:00,000

happened

587

00:28:05,590 --> 00:28:03,360

yet in that area how we can make things

588

00:28:06,470 --> 00:28:05,600

better and that's a culture we need to

589

00:28:08,950 --> 00:28:06,480

share

590

00:28:10,950 --> 00:28:08,960

uh out with the rest of the world and

591

00:28:12,950 --> 00:28:10,960

our commercial partners at a pivotal

592

00:28:14,310 --> 00:28:12,960

moment like this

593

00:28:17,990 --> 00:28:14,320

we remember

594

00:28:21,430 --> 00:28:18,000

and we rise that's our culture

595

00:28:28,710 --> 00:28:25,029

uh you know nasa's on a roll right now

596

00:28:32,470 --> 00:28:28,720

you look back the past year perseverance

597

00:28:32,480 --> 00:28:36,149

james webb

598

00:28:39,029 --> 00:28:37,590

look at the

599

00:28:41,909 --> 00:28:39,039

commercial crew

600

00:28:46,230 --> 00:28:41,919

to the station commercial cargo

601  
00:28:53,990 --> 00:28:50,310  
but as bob says it's been 19 years

602  
00:28:56,549 --> 00:28:54,000  
and uh we we've got to constantly be

603  
00:28:59,830 --> 00:28:56,559  
on our toes bob

604  
00:29:01,510 --> 00:28:59,840  
as we're getting ready for artemis one

605  
00:29:02,389 --> 00:29:01,520  
what are some of the things that come to

606  
00:29:04,950 --> 00:29:02,399  
mind

607  
00:29:07,590 --> 00:29:04,960  
oh my gosh

608  
00:29:09,269 --> 00:29:07,600  
you know i i think

609  
00:29:11,430 --> 00:29:09,279  
well one of the things

610  
00:29:13,750 --> 00:29:11,440  
is that you know

611  
00:29:16,310 --> 00:29:13,760  
we can't get launch fever we got to pay

612  
00:29:17,909 --> 00:29:16,320  
attention folks that we got a process we

613  
00:29:19,669 --> 00:29:17,919

got to work through it methodically we

614

00:29:20,549 --> 00:29:19,679

got to make sure that

615

00:29:23,269 --> 00:29:20,559

we

616

00:29:24,789 --> 00:29:23,279

cross all the t's dot all the eyes

617

00:29:26,549 --> 00:29:24,799

i think one of the biggest challenges is

618

00:29:28,470 --> 00:29:26,559

going to be getting all the uh the the

619

00:29:30,789 --> 00:29:28,480

paperwork closed out

620

00:29:32,149 --> 00:29:30,799

and uh making sure that we've documented

621

00:29:33,430 --> 00:29:32,159

everything correctly that we haven't

622

00:29:36,549 --> 00:29:33,440

missed something

623

00:29:38,310 --> 00:29:36,559

uh of course artemis one is a a test

624

00:29:40,549 --> 00:29:38,320

flight without crew but we intend to put

625

00:29:42,789 --> 00:29:40,559

crew on this vehicle we are we are

626

00:29:44,070 --> 00:29:42,799

certifying this to fly with crew on its

627

00:29:45,510 --> 00:29:44,080

second flight

628

00:29:48,070 --> 00:29:45,520

so we got to make sure that we do it

629

00:29:49,590 --> 00:29:48,080

correctly and i i think the the key

630

00:29:51,590 --> 00:29:49,600

thing is uh

631

00:29:53,590 --> 00:29:51,600

you know we can't get launched either i

632

00:29:55,190 --> 00:29:53,600

know we want to get it going but we also

633

00:29:57,029 --> 00:29:55,200

got to make sure that we're

634

00:29:59,510 --> 00:29:57,039

we're taking our time and and doing it

635

00:30:01,590 --> 00:29:59,520

right russia you know what are your

636

00:30:04,070 --> 00:30:01,600

thoughts on all of this

637

00:30:06,389 --> 00:30:04,080

well i i i'm not a former astronaut so i

638

00:30:07,590 --> 00:30:06,399

have to have notes

639

00:30:09,590 --> 00:30:07,600

but i do have a few that i wanted to

640

00:30:11,750 --> 00:30:09,600

share about risk

641

00:30:14,310 --> 00:30:11,760

and i i'd like to start actually with a

642

00:30:16,389 --> 00:30:14,320

quote from charlie bolden

643

00:30:17,990 --> 00:30:16,399

said when you do stuff that nobody else

644

00:30:21,190 --> 00:30:18,000

has ever done

645

00:30:23,029 --> 00:30:21,200

you have to be willing to accept risk

646

00:30:24,389 --> 00:30:23,039

we have to be willing to do daring

647

00:30:26,310 --> 00:30:24,399

things

648

00:30:28,630 --> 00:30:26,320

put another way

649

00:30:30,470 --> 00:30:28,640

risk intolerance is a guarantee of

650

00:30:32,549 --> 00:30:30,480

failure to accomplish anything of

651  
00:30:34,710 --> 00:30:32,559  
significance

652  
00:30:37,350 --> 00:30:34,720  
you know at the beginning of a program

653  
00:30:40,230 --> 00:30:37,360  
establishing that risk posture up front

654  
00:30:43,029 --> 00:30:40,240  
is is very critical and that establishes

655  
00:30:45,110 --> 00:30:43,039  
how much risk are you willing to take

656  
00:30:47,510 --> 00:30:45,120  
in each domain your cost schedule

657  
00:30:50,710 --> 00:30:47,520  
performance safety

658  
00:30:52,310 --> 00:30:50,720  
and that risk posture has to consider

659  
00:30:54,789 --> 00:30:52,320  
you know what's the benefit of taking

660  
00:30:56,710 --> 00:30:54,799  
that risk what are we gaining

661  
00:30:58,549 --> 00:30:56,720  
by taking that risk what makes the risk

662  
00:31:00,789 --> 00:30:58,559  
worth it

663  
00:31:02,470 --> 00:31:00,799

npd 1000 if you've read our governance

664

00:31:06,149 --> 00:31:02,480

handbook it talks about that and talks

665

00:31:08,389 --> 00:31:06,159

about a concept called risk leadership

666

00:31:09,990 --> 00:31:08,399

but human space flight is not inherently

667

00:31:12,149 --> 00:31:10,000

safe

668

00:31:13,590 --> 00:31:12,159

so the hard questions that we must

669

00:31:16,070 --> 00:31:13,600

answer are

670

00:31:19,350 --> 00:31:16,080

how safe is safe enough

671

00:31:22,149 --> 00:31:19,360

and how will we know when we're there

672

00:31:23,509 --> 00:31:22,159

you know i've been doing this job for 35

673

00:31:25,909 --> 00:31:23,519

years

674

00:31:27,430 --> 00:31:25,919

and those questions don't seem to get

675

00:31:29,509 --> 00:31:27,440

any easier

676  
00:31:31,430 --> 00:31:29,519  
but they're very important to address up

677  
00:31:33,750 --> 00:31:31,440  
front so that everybody understands

678  
00:31:35,350 --> 00:31:33,760  
where the line is

679  
00:31:36,950 --> 00:31:35,360  
and then once you're in program

680  
00:31:39,909 --> 00:31:36,960  
execution

681  
00:31:41,669 --> 00:31:39,919  
we need everyone engaged in identifying

682  
00:31:42,870 --> 00:31:41,679  
and communicating risks so decision

683  
00:31:44,630 --> 00:31:42,880  
makers

684  
00:31:47,110 --> 00:31:44,640  
can understand when that line has been

685  
00:31:49,509 --> 00:31:47,120  
crossed

686  
00:31:51,750 --> 00:31:49,519  
taking risks smartly

687  
00:31:53,990 --> 00:31:51,760  
versus being reckless

688  
00:31:55,909 --> 00:31:54,000

i think that's what we owe to our crews

689

00:31:57,750 --> 00:31:55,919

and their families

690

00:32:00,070 --> 00:31:57,760

you know so today

691

00:32:03,110 --> 00:32:00,080

we pause to reflect on our past and the

692

00:32:04,789 --> 00:32:03,120

lessons the hard lessons we have learned

693

00:32:06,950 --> 00:32:04,799

and committing ourselves to not

694

00:32:08,870 --> 00:32:06,960

repeating mistakes

695

00:32:10,950 --> 00:32:08,880

we may make new mistakes

696

00:32:12,710 --> 00:32:10,960

as our mission to explore and discover

697

00:32:15,190 --> 00:32:12,720

takes us to new places

698

00:32:18,549 --> 00:32:15,200

new challenges new environments

699

00:32:21,350 --> 00:32:18,559

but to honor those we have lost

700

00:32:23,669 --> 00:32:21,360

we must not let the lessons of apollo 1

701  
00:32:26,710 --> 00:32:23,679  
challenger in colombia show up in

702  
00:32:29,110 --> 00:32:26,720  
another investigation report

703  
00:32:31,669 --> 00:32:29,120  
to end with another charlie quote we

704  
00:32:34,549 --> 00:32:31,679  
must constantly balance our risks and

705  
00:32:37,029 --> 00:32:34,559  
rewards and always always put the lives

706  
00:32:38,630 --> 00:32:37,039  
and safety of our people first

707  
00:32:39,830 --> 00:32:38,640  
and russ i want to give you and your

708  
00:32:41,590 --> 00:32:39,840  
team

709  
00:32:44,310 --> 00:32:41,600  
a compliment

710  
00:32:46,710 --> 00:32:44,320  
you don't say no you look for that yes

711  
00:32:48,549 --> 00:32:46,720  
if answer and it's understanding what we

712  
00:32:51,509 --> 00:32:48,559  
can do to mitigate the risk

713  
00:32:54,070 --> 00:32:51,519

as we move forward you know

714

00:32:57,509 --> 00:32:54,080

we are in a very risky business

715

00:33:00,310 --> 00:32:57,519

and a lot of folks as we transition to

716

00:33:01,909 --> 00:33:00,320

the commercial model in some places if

717

00:33:05,029 --> 00:33:01,919

you look back

718

00:33:07,110 --> 00:33:05,039

you know hindsight's always 20 20. it's

719

00:33:08,870 --> 00:33:07,120

it's easy you ask me what i'm thinking

720

00:33:10,789 --> 00:33:08,880

about what worries me and i worry about

721

00:33:13,110 --> 00:33:10,799

all the decisions that we make are we

722

00:33:15,269 --> 00:33:13,120

making the right decisions now if

723

00:33:17,269 --> 00:33:15,279

something happens down the road is it

724

00:33:19,110 --> 00:33:17,279

going to be a decision that we made that

725

00:33:20,630 --> 00:33:19,120

could have impacted that one way or

726

00:33:21,669 --> 00:33:20,640

another because

727

00:33:23,350 --> 00:33:21,679

you know

728

00:33:26,630 --> 00:33:23,360

after the fact you can look back and say

729

00:33:27,909 --> 00:33:26,640

oh man that that wasn't a good decision

730

00:33:29,430 --> 00:33:27,919

so i think

731

00:33:31,029 --> 00:33:29,440

again it gets back to making sure that

732

00:33:32,710 --> 00:33:31,039

we have all the data to make the best

733

00:33:33,750 --> 00:33:32,720

informed decisions

734

00:33:35,509 --> 00:33:33,760

so

735

00:33:37,350 --> 00:33:35,519

that that's always a concern but when i

736

00:33:39,269 --> 00:33:37,360

look at the different models that we

737

00:33:41,029 --> 00:33:39,279

have now if you look at uh both

738

00:33:42,389 --> 00:33:41,039

challenger and columbia

739

00:33:45,269 --> 00:33:42,399

those were

740

00:33:47,909 --> 00:33:45,279

you know cost plus contracts with nasa

741

00:33:50,149 --> 00:33:47,919

deep involvement in each one of those

742

00:33:52,789 --> 00:33:50,159

and and just because you have that model

743

00:33:54,470 --> 00:33:52,799

that that we had then that doesn't mean

744

00:33:56,789 --> 00:33:54,480

that it's safe

745

00:33:58,630 --> 00:33:56,799

safety isn't by the model that you have

746

00:33:59,909 --> 00:33:58,640

safety is how you operate you can have

747

00:34:01,830 --> 00:33:59,919

other models

748

00:34:04,630 --> 00:34:01,840

and you need to ensure that the safety

749

00:34:06,950 --> 00:34:04,640

is embedded in it

750

00:34:09,430 --> 00:34:06,960

i'd like to bring up a point too i think

751

00:34:11,190 --> 00:34:09,440

you know as we're talking about the

752

00:34:12,629 --> 00:34:11,200

years that have gone by between the

753

00:34:17,030 --> 00:34:12,639

mishaps

754

00:34:20,230 --> 00:34:17,040

i was out with you at the sof on the day

755

00:34:23,669 --> 00:34:20,240

that the columbia crew did not come home

756

00:34:24,869 --> 00:34:23,679

and i was uh you know um

757

00:34:29,349 --> 00:34:24,879

you know

758

00:34:30,790 --> 00:34:29,359

not as experienced as you you had lived

759

00:34:34,629 --> 00:34:30,800

through challenger

760

00:34:35,990 --> 00:34:34,639

no one uh out there had been at nasa for

761

00:34:36,869 --> 00:34:36,000

challenger

762

00:34:39,109 --> 00:34:36,879

and

763

00:34:40,629 --> 00:34:39,119

i don't know how we could have i mean

764

00:34:43,109 --> 00:34:40,639

the shuttle

765

00:34:45,109 --> 00:34:43,119

is a hypersonic vehicle it's going to

766

00:34:47,030 --> 00:34:45,119

land you know plus or minus a second or

767

00:34:48,629 --> 00:34:47,040

so it's not going to be a few minutes

768

00:34:50,230 --> 00:34:48,639

late like an airplane

769

00:34:52,230 --> 00:34:50,240

but we stood there

770

00:34:53,750 --> 00:34:52,240

and those of us who had not lived

771

00:34:56,470 --> 00:34:53,760

through challenger

772

00:34:58,310 --> 00:34:56,480

were sort of in a state of well maybe

773

00:35:00,470 --> 00:34:58,320

what can we and

774

00:35:03,109 --> 00:35:00,480

you knew before everybody else because

775

00:35:05,990 --> 00:35:03,119

you had lived through challenger

776

00:35:08,550 --> 00:35:06,000

you you knew that it could happen and so

777

00:35:10,630 --> 00:35:08,560

you came to believe it first so i think

778

00:35:12,550 --> 00:35:10,640

this aspect of just

779

00:35:14,470 --> 00:35:12,560

really taking on board the fact that it

780

00:35:16,470 --> 00:35:14,480

really could happen to us

781

00:35:19,030 --> 00:35:16,480

is is a really important

782

00:35:20,630 --> 00:35:19,040

part of that that viewpoint just knowing

783

00:35:22,550 --> 00:35:20,640

that it could happen

784

00:35:24,390 --> 00:35:22,560

and believing it is important and that's

785

00:35:26,630 --> 00:35:24,400

why having a contingency plan is so

786

00:35:27,670 --> 00:35:26,640

important yeah you know you plan for the

787

00:35:30,310 --> 00:35:27,680

worst

788

00:35:32,150 --> 00:35:30,320

and and hope you never have to execute

789

00:35:35,829 --> 00:35:32,160

it but even even if you have a

790

00:35:38,310 --> 00:35:35,839

contingency plan it will never go as

791

00:35:39,030 --> 00:35:38,320

expected or as you planned and that's

792

00:35:41,990 --> 00:35:39,040

why

793

00:35:44,550 --> 00:35:42,000

leadership is so important having uh

794

00:35:47,349 --> 00:35:44,560

good leaders that are able to

795

00:35:49,670 --> 00:35:47,359

act when things don't necessarily go as

796

00:35:51,349 --> 00:35:49,680

planned

797

00:35:53,349 --> 00:35:51,359

one of the things we saw in in

798

00:35:55,109 --> 00:35:53,359

challenger and then

799

00:35:56,230 --> 00:35:55,119

unfortunately it seemed like also in

800

00:35:57,990 --> 00:35:56,240

colombia

801  
00:36:01,270 --> 00:35:58,000  
was the concept of normalization of

802  
00:36:03,190 --> 00:36:01,280  
deviance i know um any any thoughts on

803  
00:36:06,069 --> 00:36:03,200  
that and how we prevent

804  
00:36:07,190 --> 00:36:06,079  
that from recurring

805  
00:36:08,150 --> 00:36:07,200  
well

806  
00:36:10,230 --> 00:36:08,160  
again

807  
00:36:12,550 --> 00:36:10,240  
when bad things happen and when

808  
00:36:14,710 --> 00:36:12,560  
something is anomalous or not going as

809  
00:36:17,270 --> 00:36:14,720  
it should but nothing bad happens it's

810  
00:36:19,270 --> 00:36:17,280  
easy to get into a mode that it's okay

811  
00:36:21,829 --> 00:36:19,280  
and and that's why we have to pay such

812  
00:36:24,550 --> 00:36:21,839  
close attention when when something

813  
00:36:28,150 --> 00:36:24,560

isn't working exam exactly right you

814

00:36:31,030 --> 00:36:28,160

know i would say we've seen a couple of

815

00:36:33,030 --> 00:36:31,040

uh delayed parachute delays now on uh

816

00:36:35,190 --> 00:36:33,040

forced chute with uh

817

00:36:36,470 --> 00:36:35,200

cargo vehicles returning in one crew

818

00:36:37,990 --> 00:36:36,480

vehicle and

819

00:36:39,829 --> 00:36:38,000

we need to make sure that we understand

820

00:36:41,589 --> 00:36:39,839

the model that we have that we're okay

821

00:36:43,990 --> 00:36:41,599

as we go forward that's going to require

822

00:36:46,150 --> 00:36:44,000

a little a little looking into and and

823

00:36:48,550 --> 00:36:46,160

not just accepting that well it's okay

824

00:36:51,670 --> 00:36:48,560

nothing bad happen

825

00:36:54,230 --> 00:36:51,680

and of course uh since we have this

826  
00:36:57,430 --> 00:36:54,240  
model where we are now working with the

827  
00:36:58,710 --> 00:36:57,440  
commercial companies

828  
00:37:03,510 --> 00:36:58,720  
we want to

829  
00:37:05,109 --> 00:37:03,520  
assure you that nasa is very much

830  
00:37:08,230 --> 00:37:05,119  
involved

831  
00:37:11,030 --> 00:37:08,240  
with the commercial companies

832  
00:37:13,750 --> 00:37:11,040  
to ensure this safety but we don't want

833  
00:37:15,990 --> 00:37:13,760  
to ever get into the mindset oh well the

834  
00:37:18,870 --> 00:37:16,000  
company is doing that

835  
00:37:21,190 --> 00:37:18,880  
as part of the commercial crew

836  
00:37:22,870 --> 00:37:21,200  
or in the case of the moon landing the

837  
00:37:25,030 --> 00:37:22,880  
commercial

838  
00:37:27,030 --> 00:37:25,040

lander

839

00:37:30,069 --> 00:37:27,040

let the company do that

840

00:37:31,990 --> 00:37:30,079

nasa's got to stay all over it when it

841

00:37:33,990 --> 00:37:32,000

comes

842

00:37:36,310 --> 00:37:34,000

to the safety

843

00:37:40,550 --> 00:37:36,320

of our own people of our own people and

844

00:37:44,790 --> 00:37:42,150

and that's what all comes down to it

845

00:37:47,190 --> 00:37:44,800

comes down to uh taking care of people

846

00:37:49,190 --> 00:37:47,200

to leadership to communication i mean i

847

00:37:50,630 --> 00:37:49,200

think communication has been the key in

848

00:37:51,829 --> 00:37:50,640

so much of this

849

00:37:53,670 --> 00:37:51,839

and i i

850

00:37:55,910 --> 00:37:53,680

i want to make sure that everybody is

851  
00:37:58,069 --> 00:37:55,920  
being heard and i

852  
00:37:59,750 --> 00:37:58,079  
i think we do

853  
00:38:01,829 --> 00:37:59,760  
a pretty good job but there's always

854  
00:38:03,670 --> 00:38:01,839  
room for improvement and i don't want

855  
00:38:05,270 --> 00:38:03,680  
after the fact somebody to say but i was

856  
00:38:08,390 --> 00:38:05,280  
raising this as an issue and nobody

857  
00:38:11,670 --> 00:38:10,230  
and of course the examples we've given

858  
00:38:12,950 --> 00:38:11,680  
you to the day

859  
00:38:16,550 --> 00:38:12,960  
that

860  
00:38:19,829 --> 00:38:16,560  
we have had some personal experience in

861  
00:38:22,150 --> 00:38:19,839  
all are

862  
00:38:24,470 --> 00:38:22,160  
around this idea that when you stop

863  
00:38:25,990 --> 00:38:24,480

communicating when you think you know it

864

00:38:29,589 --> 00:38:26,000

all

865

00:38:33,270 --> 00:38:29,599

and you're not listening to your people

866

00:38:36,790 --> 00:38:33,280

that's when you get in trouble

867

00:38:39,349 --> 00:38:36,800

so we hope that uh this discussion do

868

00:38:41,750 --> 00:38:39,359

you have anything more right i do have a

869

00:38:43,589 --> 00:38:41,760

question for pam um you know so pam as

870

00:38:45,670 --> 00:38:43,599

the as the champion of

871

00:38:47,829 --> 00:38:45,680

diversity equity inclusion and

872

00:38:50,310 --> 00:38:47,839

accessibility for nasa

873

00:38:52,710 --> 00:38:50,320

how do you see that

874

00:38:54,470 --> 00:38:52,720

those elements playing into the culture

875

00:38:56,950 --> 00:38:54,480

that we want to have that ensure safety

876

00:39:00,390 --> 00:38:56,960

going forward

877

00:39:02,710 --> 00:39:00,400

deia is so central to our mission for a

878

00:39:05,430 --> 00:39:02,720

couple of different reasons and

879

00:39:07,829 --> 00:39:05,440

each aspect has some

880

00:39:10,790 --> 00:39:07,839

angle or lens that we can look at how it

881

00:39:12,630 --> 00:39:10,800

impacts our mission and our safety

882

00:39:14,790 --> 00:39:12,640

particularly as we are doing very

883

00:39:17,510 --> 00:39:14,800

difficult things

884

00:39:19,109 --> 00:39:17,520

i mean we felt this way with the crew

885

00:39:20,790 --> 00:39:19,119

it was really good to have diverse

886

00:39:23,510 --> 00:39:20,800

backgrounds

887

00:39:26,310 --> 00:39:23,520

one of my favorite stories is that

888

00:39:29,109 --> 00:39:26,320

at the intelsat rescue

889

00:39:31,910 --> 00:39:29,119

the guy on the crew who knew absolutely

890

00:39:33,829 --> 00:39:31,920

nothing about eva the rookie pilot

891

00:39:36,470 --> 00:39:33,839

kevin chilton one of the best astronauts

892

00:39:38,470 --> 00:39:36,480

we've ever had but on his rookie flight

893

00:39:40,550 --> 00:39:38,480

asked the question well why can't we

894

00:39:43,190 --> 00:39:40,560

send three astronauts out eva at the

895

00:39:45,910 --> 00:39:43,200

same time no one would have thought of

896

00:39:48,150 --> 00:39:45,920

that without somebody who had

897

00:39:50,870 --> 00:39:48,160

no preconceived ideas

898

00:39:53,589 --> 00:39:50,880

so as we are are doing the things that

899

00:39:56,870 --> 00:39:53,599

are challenging we need to have a set of

900

00:40:00,069 --> 00:39:56,880

diverse perspectives for problem solving

901  
00:40:03,109 --> 00:40:00,079  
for creativity for new ideas and seeing

902  
00:40:04,630 --> 00:40:03,119  
things but i think inclusion in

903  
00:40:07,430 --> 00:40:04,640  
particular

904  
00:40:09,510 --> 00:40:07,440  
and and accessibility gets to the access

905  
00:40:11,829 --> 00:40:09,520  
to the point of all voices being heard

906  
00:40:13,430 --> 00:40:11,839  
absolutely and and to to make sure that

907  
00:40:14,309 --> 00:40:13,440  
everyone feels

908  
00:40:16,710 --> 00:40:14,319  
safe

909  
00:40:19,589 --> 00:40:16,720  
uh they are sure that they are a part of

910  
00:40:21,349 --> 00:40:19,599  
the nasa team uh part of the nasa family

911  
00:40:23,190 --> 00:40:21,359  
and that they have the right to speak up

912  
00:40:26,150 --> 00:40:23,200  
and the right to be heard

913  
00:40:27,190 --> 00:40:26,160

so the you know to me it's foundational

914

00:40:30,069 --> 00:40:27,200

to both

915

00:40:31,510 --> 00:40:30,079

our mission success but also our safety

916

00:40:34,390 --> 00:40:31,520

culture

917

00:40:37,990 --> 00:40:34,400

and russ you know um you're now

918

00:40:40,950 --> 00:40:38,000

responsible or the owner of the apollo

919

00:40:43,990 --> 00:40:40,960

challenger columbia

920

00:40:47,190 --> 00:40:44,000

learning if you will and

921

00:40:49,750 --> 00:40:47,200

i would i would hope that all of you

922

00:40:52,470 --> 00:40:49,760

when you get down to florida

923

00:40:53,670 --> 00:40:52,480

if you have not had the opportunity

924

00:40:55,670 --> 00:40:53,680

go to

925

00:40:58,150 --> 00:40:55,680

the visitor center and

926  
00:41:00,950 --> 00:40:58,160  
tour forever remembered at the atlantis

927  
00:41:02,630 --> 00:41:00,960  
facility which is a tribute to the

928  
00:41:05,109 --> 00:41:02,640  
challenger and columbia cruise and it

929  
00:41:06,630 --> 00:41:05,119  
talks about each of the crew members

930  
00:41:09,030 --> 00:41:06,640  
it talks about

931  
00:41:11,829 --> 00:41:09,040  
the the accident

932  
00:41:14,230 --> 00:41:11,839  
emotional and and physical recovery of

933  
00:41:15,589 --> 00:41:14,240  
the debris and and it also talks about

934  
00:41:18,230 --> 00:41:15,599  
moving forward

935  
00:41:19,349 --> 00:41:18,240  
and uh return to flight and also out at

936  
00:41:29,270 --> 00:41:19,359  
the

937  
00:41:32,550 --> 00:41:29,280  
it talks about

938  
00:41:34,630 --> 00:41:32,560

the design changes and what was done to

939

00:41:35,750 --> 00:41:34,640

improve spacecraft and

940

00:41:37,030 --> 00:41:35,760

you know i mean

941

00:41:39,829 --> 00:41:37,040

there were a lot of changes on the

942

00:41:41,430 --> 00:41:39,839

apollo vehicle after the uh the fire

943

00:41:42,950 --> 00:41:41,440

there were over 100 changes to

944

00:41:45,030 --> 00:41:42,960

challenger after the fire we made

945

00:41:47,349 --> 00:41:45,040

multiple changes to uh

946

00:41:48,630 --> 00:41:47,359

to the tank in the process after

947

00:41:50,550 --> 00:41:48,640

columbia

948

00:41:53,829 --> 00:41:50,560

i think it's really important

949

00:41:55,430 --> 00:41:53,839

you know yes we had accidents but we

950

00:41:57,670 --> 00:41:55,440

learned from them and rose above them

951  
00:41:59,190 --> 00:41:57,680  
and and went on to do more and i i just

952  
00:42:01,270 --> 00:41:59,200  
would like to see us

953  
00:42:03,510 --> 00:42:01,280  
not have to relearn some of this stuff

954  
00:42:06,710 --> 00:42:03,520  
but what i wanted to get to is

955  
00:42:09,589 --> 00:42:06,720  
i think everybody that has a chance

956  
00:42:11,589 --> 00:42:09,599  
we have the columbia

957  
00:42:13,190 --> 00:42:11,599  
remains stored in the vehicle assembly

958  
00:42:15,430 --> 00:42:13,200  
building and man if i have my way

959  
00:42:17,349 --> 00:42:15,440  
everybody that's a senior leader at nasa

960  
00:42:19,430 --> 00:42:17,359  
would see that firsthand it goes back to

961  
00:42:21,670 --> 00:42:19,440  
that picture that i showed earlier the

962  
00:42:25,190 --> 00:42:21,680  
consequences of the decisions that we

963  
00:42:26,390 --> 00:42:25,200

make but we do we do hope that that by

964

00:42:28,870 --> 00:42:26,400

this summer

965

00:42:29,670 --> 00:42:28,880

um things are so that we can restart

966

00:42:31,670 --> 00:42:29,680

that

967

00:42:34,710 --> 00:42:31,680

safety leadership program and bring

968

00:42:35,990 --> 00:42:34,720

executives down to ksc and give them

969

00:42:37,829 --> 00:42:36,000

those tours

970

00:42:40,069 --> 00:42:37,839

and you know bob because i was there

971

00:42:43,750 --> 00:42:40,079

with you

972

00:42:45,829 --> 00:42:43,760

much credit to bob for creating those

973

00:42:47,910 --> 00:42:45,839

exhibits at the visitors center and they

974

00:42:52,710 --> 00:42:47,920

are

975

00:42:53,990 --> 00:42:52,720

um it's hard to walk through them

976  
00:42:55,910 --> 00:42:54,000  
without

977  
00:42:58,309 --> 00:42:55,920  
tearing up but

978  
00:42:59,910 --> 00:42:58,319  
thank you but but i i really want to see

979  
00:43:01,829 --> 00:42:59,920  
that executive leadership program

980  
00:43:04,150 --> 00:43:01,839  
started i was just going to say yeah i

981  
00:43:07,109 --> 00:43:04,160  
that's that's really important it's

982  
00:43:10,069 --> 00:43:07,119  
timely and it's very important and i

983  
00:43:12,470 --> 00:43:10,079  
will say speaking of training um next

984  
00:43:15,270 --> 00:43:12,480  
week i believe february 1st we're

985  
00:43:17,670 --> 00:43:15,280  
rolling out to all civil service

986  
00:43:20,069 --> 00:43:17,680  
training plans in saturn a new

987  
00:43:21,829 --> 00:43:20,079  
a new organizational silence

988  
00:43:23,910 --> 00:43:21,839

a kind of familiarization course so that

989

00:43:26,230 --> 00:43:23,920

you can understand what are the factors

990

00:43:27,829 --> 00:43:26,240

that go into that it you know it's it's

991

00:43:32,630 --> 00:43:27,839

usually as you say as you said earlier

992

00:43:37,270 --> 00:43:35,109

person with with ill intent

993

00:43:39,829 --> 00:43:37,280

running things it's just there's these

994

00:43:43,750 --> 00:43:39,839

dynamics that sort of if you're not on

995

00:43:45,670 --> 00:43:43,760

guard they happen and contribute to

996

00:43:47,589 --> 00:43:45,680

the wrong environment

997

00:43:49,829 --> 00:43:47,599

and by the way i thought that uh

998

00:43:51,270 --> 00:43:49,839

challenger uh safety course that was in

999

00:43:52,829 --> 00:43:51,280

center that we all had to take was

1000

00:43:54,950 --> 00:43:52,839

excellent you guys did a great job on

1001  
00:43:57,750 --> 00:43:54,960  
that thank you

1002  
00:44:00,309 --> 00:43:57,760  
well we want to thank you for joining us

1003  
00:44:04,309 --> 00:44:02,550  
we wanted to

1004  
00:44:07,270 --> 00:44:04,319  
have a discussion

1005  
00:44:10,390 --> 00:44:07,280  
on a day of remembrance

1006  
00:44:13,510 --> 00:44:10,400  
as we look forward to this incredible

1007  
00:44:17,109 --> 00:44:13,520  
future that we have

1008  
00:44:19,910 --> 00:44:17,119  
we are by nature in the nasa family we

1009  
00:44:24,230 --> 00:44:19,920  
are overcomers

1010  
00:44:25,190 --> 00:44:24,240  
and we have overcome these tragedies

1011  
00:44:27,349 --> 00:44:25,200  
and

1012  
00:44:30,630 --> 00:44:27,359  
any tragedies in the future we will

1013  
00:44:35,190 --> 00:44:31,430

but

1014

00:44:36,870 --> 00:44:35,200

being an overcomer is also

1015

00:44:39,190 --> 00:44:36,880

being someone that

1016

00:44:43,190 --> 00:44:39,200

is concerned about the subjects that

1017

00:44:46,790 --> 00:44:44,309

so

1018

00:44:48,150 --> 00:44:46,800

we thank you for being a part of this

1019

00:44:51,910 --> 00:44:48,160

discussion

1020

00:44:54,790 --> 00:44:51,920

we thank you for reflecting with us

1021

00:44:57,430 --> 00:44:54,800

on this day of remembrance

1022

00:44:59,109 --> 00:44:57,440

we thank you for remembering these

1023

00:45:01,750 --> 00:44:59,119

heroes

1024

00:45:04,790 --> 00:45:01,760

and many more that

1025

00:45:08,470 --> 00:45:04,800

we have not talked about people that

1026  
00:45:09,910 --> 00:45:08,480  
lost their lives in the nasa program

1027  
00:45:13,270 --> 00:45:09,920  
that

1028  
00:45:17,030 --> 00:45:13,280  
have not been memorialized here

1029  
00:45:20,550 --> 00:45:17,040  
but in a training accident or

1030  
00:45:24,950 --> 00:45:20,560  
something of where they were actually

1031  
00:45:28,470 --> 00:45:24,960  
contributing to nasa lost their life

1032  
00:45:30,630 --> 00:45:28,480  
so it's good to remember

1033  
00:45:34,069 --> 00:45:30,640  
but it's good

1034  
00:45:40,309 --> 00:45:37,670  
so thank you for joining us

1035  
00:45:43,670 --> 00:45:40,319  
and we're going to put on the screen

1036  
00:45:46,790 --> 00:45:43,680  
a picture of the astronaut t-38s in

1037  
00:45:50,550 --> 00:45:46,800  
flying in formation

1038  
00:45:52,230 --> 00:45:50,560

and when one of the four pulls up

1039

00:45:56,630 --> 00:45:52,240

going heavenward

1040

00:46:00,790 --> 00:45:59,109

god bless you

1041

00:46:03,670 --> 00:46:00,800

thank you

1042

00:46:11,910 --> 00:46:03,680

for your public service

1043

00:46:11,920 --> 00:46:47,660

[Applause]