



1  
00:00:04,309 --> 00:00:01,510  
hi

2  
00:00:05,190 --> 00:00:04,319  
i'm sts-131 mission specialist number

3  
00:00:07,110 --> 00:00:05,200  
two

4  
00:00:41,750 --> 00:00:07,120  
dottie metcalf lindenberger and you're

5  
00:00:41,760 --> 00:00:48,869  
and if i'm flying

6  
00:00:48,879 --> 00:01:11,590  
me

7  
00:01:29,030 --> 00:01:15,350  
you in all of us no wizard that there is

8  
00:01:35,109 --> 00:01:31,030  
good morning discovery and a special

9  
00:01:40,710 --> 00:01:38,950  
good morning megan and good

10  
00:01:43,910 --> 00:01:40,720  
i look forward to morning with all of

11  
00:01:46,149 --> 00:01:43,920  
you guys today on ebay one

12  
00:01:49,270 --> 00:01:46,159  
and a special good morning

13  
00:01:52,389 --> 00:01:49,280

for my husband's hotel supporters jason

14

00:02:02,709 --> 00:01:52,399

and to my wonderful daughter cambrie

15

00:02:06,870 --> 00:02:04,310

thanks dottie those are great words

16

00:02:08,710 --> 00:02:06,880

we'll pass the message

17

00:02:10,710 --> 00:02:08,720

flooded engineer tracy caldwell dyson

18

00:02:13,510 --> 00:02:10,720

and pilot jim dutton looking through the

19

00:02:15,350 --> 00:02:13,520

hatch uh into the

20

00:02:16,869 --> 00:02:15,360

crew lot portion of the quest airlock

21

00:02:18,390 --> 00:02:16,879

where the spacewalkers are getting ready

22

00:02:21,430 --> 00:02:18,400

to open the hatch

23

00:02:22,710 --> 00:02:21,440

out to the vacuum of space

24

00:02:24,869 --> 00:02:22,720

gentlemen the weather's beautiful

25

00:02:28,470 --> 00:02:24,879

outside it's a great day for an eva

26

00:02:29,830 --> 00:02:28,480

we're complete with the uh

27

00:02:31,030 --> 00:02:29,840

patches open

28

00:02:33,350 --> 00:02:31,040

okay i'm going to hand you over to

29

00:02:35,430 --> 00:02:33,360

dottie for the post press

30

00:02:37,589 --> 00:02:35,440

have a great time guys thank you jim

31

00:02:39,670 --> 00:02:37,599

good job

32

00:02:41,830 --> 00:02:39,680

breaking clay this is daddy how do you

33

00:02:43,830 --> 00:02:41,840

hear me daddy loud and clear loud and

34

00:02:45,270 --> 00:02:43,840

clear dot

35

00:02:46,710 --> 00:02:45,280

awesome

36

00:02:48,790 --> 00:02:46,720

mission specialist dottie metcalf

37

00:02:50,790 --> 00:02:48,800

lindenberger is watching walking

38

00:02:52,470 --> 00:02:50,800

anderson and mistrachio through the

39

00:02:53,750 --> 00:02:52,480

steps before they head outside of the

40

00:02:54,869 --> 00:02:53,760

airlock

41

00:02:56,710 --> 00:02:54,879

she'll be working

42

00:02:58,390 --> 00:02:56,720

as today's intravehicular officer

43

00:03:01,270 --> 00:02:58,400

choreographing the spacewalk from inside

44

00:03:04,309 --> 00:03:01,280

the station okay if you agree stan i

45

00:03:15,589 --> 00:03:04,319

show it on step 14 and you have a go for

46

00:03:21,350 --> 00:03:19,270

strikeo will go over to that old

47

00:03:23,270 --> 00:03:21,360

ammonia tank assembly with anderson and

48

00:03:24,869 --> 00:03:23,280

retrieve

49

00:03:26,630 --> 00:03:24,879

what's called a fixed gravel bar which

50

00:03:29,030 --> 00:03:26,640

is going to be used as a handle he'll

51  
00:03:31,589 --> 00:03:29,040  
install it on the new ammonia tank

52  
00:03:34,070 --> 00:03:31,599  
assembly in the shuttle's cargo bay to

53  
00:03:38,550 --> 00:03:34,080  
allow the station's robotic arm to get a

54  
00:03:42,070 --> 00:03:40,229  
you can see the

55  
00:03:45,030 --> 00:03:42,080  
end of the shuttle's rope at stations or

56  
00:03:48,070 --> 00:03:45,040  
body farm here at the top

57  
00:03:51,589 --> 00:03:48,080  
right hand corner of the screen

58  
00:03:53,830 --> 00:03:51,599  
and the fixed grapple bar that

59  
00:03:55,990 --> 00:03:53,840  
mistrachio installed at the beginning of

60  
00:04:15,670 --> 00:03:56,000  
the spacewalk will be used to grab onto

61  
00:04:15,680 --> 00:04:23,990  
okay daddy i'm at esp2

62  
00:04:29,749 --> 00:04:27,350  
all right i can see you there

63  
00:04:31,749 --> 00:04:29,759

and uh rick's almost there uh right

64

00:04:37,270 --> 00:04:31,759

there chloe how you doing

65

00:04:40,950 --> 00:04:38,870

all right so let's just watch out we

66

00:04:41,749 --> 00:04:40,960

don't bump into this

67

00:04:43,590 --> 00:04:41,759

put my guy

68

00:04:46,550 --> 00:04:43,600

down looks like

69

00:04:48,390 --> 00:04:46,560

sunshine on my shoulders

70

00:04:49,990 --> 00:04:48,400

mission specialist rick mastracchio here

71

00:04:52,310 --> 00:04:50,000

in the foreground with the red stripes

72

00:04:55,990 --> 00:04:52,320

on his spacesuit and behind him mission

73

00:04:58,710 --> 00:04:56,000

specialist clay anderson

74

00:05:00,550 --> 00:04:58,720

here comes motion station f

75

00:05:01,670 --> 00:05:00,560

and we'll hand you off the clearance of

76

00:05:04,550 --> 00:05:01,680

the tank

77

00:05:06,629 --> 00:05:04,560

to the agb and esp2

78

00:05:08,310 --> 00:05:06,639

okay

79

00:05:17,110 --> 00:05:08,320

i think i see motion

80

00:05:17,120 --> 00:05:24,710

get comfortable

81

00:05:28,870 --> 00:05:27,189

detroit hold on okay you ready to uh let

82

00:05:31,029 --> 00:05:28,880

us put it in

83

00:05:32,870 --> 00:05:31,039

uh we need to go to standby so if you

84

00:05:41,029 --> 00:05:32,880

like that position we'll get in standby

85

00:05:46,550 --> 00:05:43,749

i don't know it's pretty tight

86

00:05:49,590 --> 00:05:46,560

i think it will though

87

00:06:04,790 --> 00:05:49,600

i think i'm willing to give it a shot

88

00:06:10,150 --> 00:06:06,390

set up here and i'm

89

00:06:14,469 --> 00:06:12,230

the terra that uh mracchio was talking

90

00:06:16,230 --> 00:06:14,479

about with lindenberger there is the

91

00:06:18,469 --> 00:06:16,240

temporary equipment restraint assembly

92

00:06:19,990 --> 00:06:18,479

he's trying to see if the right gyro

93

00:06:23,110 --> 00:06:20,000

assembly that he's removing is going to

94

00:06:25,990 --> 00:06:23,120

be able to slip out of there around that

95

00:06:28,230 --> 00:06:26,000

equipment restraint

96

00:06:31,189 --> 00:06:28,240

if he can't fit the right gyro assembly

97

00:06:32,629 --> 00:06:31,199

out around the tara he has

98

00:06:33,909 --> 00:06:32,639

steps to

99

00:06:36,230 --> 00:06:33,919

that will enable him to remove the

100

00:06:38,309 --> 00:06:36,240

terror temporarily so that he can slip

101  
00:06:41,029 --> 00:06:38,319  
that

102  
00:06:45,909 --> 00:06:41,039  
old ray jay recently out

103  
00:06:45,919 --> 00:06:52,469  
yes i see is it is it coming or not

104  
00:06:59,029 --> 00:06:54,710  
it's about a quarter of an inch too

105  
00:07:03,110 --> 00:07:01,510  
thank you

106  
00:07:05,270 --> 00:07:03,120  
so it's not quite going to bit uh

107  
00:07:07,189 --> 00:07:05,280  
instead he'll have to

108  
00:07:08,790 --> 00:07:07,199  
remove the tara the temporary equipment

109  
00:07:10,790 --> 00:07:08,800  
restraint assembly next to it there

110  
00:07:14,230 --> 00:07:10,800  
that's blocking the path we'll get the

111  
00:07:16,790 --> 00:07:14,240  
teleport to come out okay

112  
00:07:20,710 --> 00:07:16,800  
and discovery with an update the ata is

113  
00:07:28,390 --> 00:07:23,189

yeah we see that we're looking at it out

114

00:07:32,710 --> 00:07:31,029

this is a shot of rick mastracchio

115

00:07:35,350 --> 00:07:32,720

he is getting very close to wrapping up

116

00:07:37,270 --> 00:07:35,360

this rate gyro assembly replacement

117

00:07:41,749 --> 00:07:37,280

the team here in houston just got the go

118

00:07:45,830 --> 00:07:43,430

so miss rankia was wrapping up that

119

00:07:47,430 --> 00:07:45,840

activity as we mentioned the crew is

120

00:07:51,670 --> 00:07:47,440

right on the timeline this morning

121

00:07:55,909 --> 00:07:53,510

as we look at rick mastracchio's helmet

122

00:07:57,749 --> 00:07:55,919

cam view we also received word from the

123

00:07:58,710 --> 00:07:57,759

robotics officer here inside mission

124

00:08:00,390 --> 00:07:58,720

control

125

00:08:03,950 --> 00:08:00,400

that the station's robotic arm has

126

00:08:06,550 --> 00:08:03,960

wrapped up its activity for the day

127

00:08:09,270 --> 00:08:06,560

sts-131 pilot jim dutton and mission

128

00:08:11,110 --> 00:08:09,280

specialist stephanie wilson were at the

129

00:08:13,589 --> 00:08:11,120

controls of that arm as it moved the

130

00:08:15,270 --> 00:08:13,599

ammonia tank assembly the brand new one

131

00:08:17,510 --> 00:08:15,280

that was lifted up out of discovery's

132

00:08:19,830 --> 00:08:17,520

payload bay and moved it over to a

133

00:08:21,909 --> 00:08:19,840

temporary stowage location on the

134

00:08:23,589 --> 00:08:21,919

station's mobile base structure so that

135

00:08:26,629 --> 00:08:23,599

handoff has occurred

136

00:08:36,149 --> 00:08:26,639

and as we mentioned the robotic arm is

137

00:08:39,350 --> 00:08:37,990

mastracchio and anderson beginning to

138

00:08:40,949 --> 00:08:39,360

check their tools to make sure that

139

00:08:43,190 --> 00:08:40,959

everything is

140

00:08:44,949 --> 00:08:43,200

back into their bags that came out with

141

00:08:46,230 --> 00:08:44,959

them

142

00:08:48,070 --> 00:08:46,240

it'll take him just a few minutes to

143

00:08:49,670 --> 00:08:48,080

finish up this activity and to make

144

00:08:52,949 --> 00:08:49,680

their way back to the quest airlock

145

00:08:54,870 --> 00:08:52,959

we're at 5 hours and 54 minutes now

146

00:08:56,550 --> 00:08:54,880

there's rick mastracchio there is once

147

00:08:58,550 --> 00:08:56,560

again he's the one that has the red

148

00:08:59,910 --> 00:08:58,560

stripes on his legs

149

00:09:10,230 --> 00:08:59,920

clay anderson has the old white

150

00:09:15,910 --> 00:09:13,430

and um rick uh while

151

00:09:18,710 --> 00:09:15,920

while uh clay's moving

152

00:09:21,509 --> 00:09:18,720

you want to do some tool tricks with me

153

00:09:24,230 --> 00:09:21,519

yeah i'm looking at my tools and i got a

154

00:09:26,470 --> 00:09:24,240

run on the bag there

155

00:09:28,230 --> 00:09:26,480

my other rest

156

00:09:29,829 --> 00:09:28,240

was the last time we did a tool check

157

00:09:32,630 --> 00:09:29,839

daddy

158

00:09:35,509 --> 00:09:32,640

after the rga right

159

00:09:37,430 --> 00:09:35,519

yeah we did the rga and then you came

160

00:09:39,030 --> 00:09:37,440

back to the airlock

161

00:09:41,509 --> 00:09:39,040

i think i left one of my rectum here

162

00:09:43,350 --> 00:09:41,519

lock um i'm gonna go let me go bring

163

00:09:44,710 --> 00:09:43,360

this bag in and then i'll tell you if i

164

00:09:46,470 --> 00:09:44,720

did on that

165

00:09:48,150 --> 00:09:46,480

one of my reps is i'm gonna count to

166

00:09:50,230 --> 00:09:48,160

four and i don't think i even used it

167

00:09:51,990 --> 00:09:50,240

for anything

168

00:09:53,910 --> 00:09:52,000

so let me pick up this bag i'll go in

169

00:09:55,509 --> 00:09:53,920

your lock and put this up

170

00:10:02,829 --> 00:09:55,519

okay then we'll do a little check of

171

00:10:07,670 --> 00:10:05,829

great had a very busy

172

00:10:08,870 --> 00:10:07,680

list of tasks that they needed to

173

00:10:11,030 --> 00:10:08,880

accomplish today and they got pretty

174

00:10:13,350 --> 00:10:11,040

much everything done

175

00:10:15,190 --> 00:10:13,360

including several get ahead tasks that

176

00:10:16,630 --> 00:10:15,200

uh set up for

177

00:10:20,230 --> 00:10:16,640

the remaining three shuttle missions

178

00:10:23,509 --> 00:10:22,069

rick mastracchio getting ready to enter

179

00:10:25,269 --> 00:10:23,519

into the quest airline which you see

180

00:10:27,670 --> 00:10:25,279

there on your screen

181

00:10:29,190 --> 00:10:27,680

those large doghouse

182

00:10:32,069 --> 00:10:29,200

looking things on top of the quest

183

00:10:34,150 --> 00:10:32,079

airlock are actually the oxygen tanks

184

00:10:35,910 --> 00:10:34,160

those tanks are used to

185

00:10:40,470 --> 00:10:35,920

repressurize the airlock at the end of

186

00:10:48,550 --> 00:10:42,470

all right man

187

00:10:51,430 --> 00:10:50,389

yep and you should have the other one on

188

00:11:01,990 --> 00:10:51,440

your right

189

00:11:06,230 --> 00:11:03,509

so the crew easing their way into the

190

00:11:08,310 --> 00:11:06,240

quest airlock it's a sort of a tight fit

191

00:11:09,590 --> 00:11:08,320

in that hatch

192

00:11:11,269 --> 00:11:09,600

once they get inside they will close

193

00:11:13,350 --> 00:11:11,279

that flap which you will see they'll

194

00:11:14,870 --> 00:11:13,360

shut the hatch plug themselves back into

195

00:11:16,389 --> 00:11:14,880

the station's power and communication

196

00:11:18,430 --> 00:11:16,399

supply

197

00:11:21,430 --> 00:11:18,440

the rest of the expedition 23 and

198

00:11:23,509 --> 00:11:21,440

sts-131 crew are eagerly awaiting

199

00:11:24,870 --> 00:11:23,519

their return to the station and they

200

00:11:26,790 --> 00:11:24,880

will begin to

201  
00:11:28,949 --> 00:11:26,800  
repressurize the quest airlock and that

202  
00:11:31,269 --> 00:11:28,959  
will signal the end of today's spacewalk

203  
00:11:34,230 --> 00:11:31,279  
right now we're at six hours in 16

204  
00:11:37,030 --> 00:11:34,240  
minutes and continuing to count

205  
00:11:41,829 --> 00:11:39,430  
so don't want to be unasked

206  
00:11:53,990 --> 00:11:41,839  
you wanna yeah abs and high with your

207  
00:12:22,310 --> 00:11:55,430  
all right let me just get this thermal

208  
00:12:26,069 --> 00:12:24,949  
there's sts-131 pilot jim dutton he's on

209  
00:12:29,269 --> 00:12:26,079  
the other side of the hatch getting

210  
00:12:32,790 --> 00:12:29,279  
ready to um help the crew members

211  
00:12:35,990 --> 00:12:34,069  
and we'll also be helping them get out

212  
00:12:37,350 --> 00:12:36,000  
their spacesuits once the quest airlock

213  
00:12:38,470 --> 00:12:37,360

has been repressurized if you look

214

00:12:40,150 --> 00:12:38,480

through that

215

00:12:42,389 --> 00:12:40,160

window that porthole there at the top

216

00:12:44,230 --> 00:12:42,399

you can see both clay anderson and rick

217

00:12:46,710 --> 00:12:44,240

mastracchio as they finish up these last

218

00:12:52,310 --> 00:12:46,720

few tasks

219

00:12:55,590 --> 00:12:53,750

all right well it's been a pleasure

220

00:12:57,990 --> 00:12:55,600

talking with you guys all day and i'm

221

00:13:00,389 --> 00:12:58,000

going to hand it now over to jim in step

222

00:13:02,310 --> 00:13:00,399

3 on the depression rescue card thank

223

00:13:03,110 --> 00:13:02,320

you very much daddy thanks daddy great

224

00:13:07,430 --> 00:13:03,120

job

225

00:13:10,949 --> 00:13:08,629

all right gentlemen i imagine you're

226

00:13:13,590 --> 00:13:10,959

ready to come back in um

227

00:13:15,670 --> 00:13:13,600

clay we'll start with you on the uia if

228

00:13:17,910 --> 00:13:15,680

you can check the oxygen emu one and two

229

00:13:19,990 --> 00:13:17,920

valves two are in open

230

00:13:23,430 --> 00:13:20,000

they are

231

00:13:27,350 --> 00:13:23,440

okay then you can take switch power tv

232

00:13:32,470 --> 00:13:30,150

custom music down to the scuba muscle

233

00:13:34,230 --> 00:13:32,480

evening payload bay you know i had to

234

00:13:36,949 --> 00:13:34,240

move actually very very slow because

235

00:13:37,910 --> 00:13:36,959

that fgb is quite bulky

236

00:13:44,150 --> 00:13:37,920

but

237

00:13:47,269 --> 00:13:45,910

rick and clay did a great job outside

238

00:13:50,230 --> 00:13:47,279

all day and we've got a couple of

239

00:13:51,509 --> 00:13:50,240

different clips of them

240

00:13:52,790 --> 00:13:51,519

around the space station doing the great

241

00:13:54,949 --> 00:13:52,800

work they did and with the great

242

00:13:57,110 --> 00:13:54,959

teamwork all day by uh by all parties

243

00:13:59,189 --> 00:13:57,120

involved to the ground and the

244

00:14:01,269 --> 00:13:59,199

flight crews who just had a terrific day

245

00:14:03,829 --> 00:14:01,279

here's dottie on the flight deck

246

00:14:05,030 --> 00:14:03,839

doing her iv thing

247

00:14:07,670 --> 00:14:05,040

yeah i think the best thing about

248

00:14:09,269 --> 00:14:07,680

working on the flight deck is just that

249

00:14:12,790 --> 00:14:09,279

on earth you have to put all of your

250

00:14:14,389 --> 00:14:12,800

checklists on tables and find space but

251  
00:14:16,870 --> 00:14:14,399  
up here it's much easier i could hang

252  
00:14:19,829 --> 00:14:16,880  
things as you can see off of monitors

253  
00:14:21,910 --> 00:14:19,839  
and off the ceiling i had stuff strapped

254  
00:14:24,870 --> 00:14:21,920  
off the floor and had about five

255  
00:14:28,230 --> 00:14:24,880  
checklists going all at the same time

256  
00:14:35,110 --> 00:14:29,750  
and this looks like we're back outside

257  
00:14:37,990 --> 00:14:36,629  
a little reflection here as we were

258  
00:14:39,269 --> 00:14:38,000  
taking one of the monitors we're a

259  
00:14:40,790 --> 00:14:39,279  
little degraded with our recording

260  
00:14:42,629 --> 00:14:40,800  
capability

261  
00:14:44,389 --> 00:14:42,639  
but this is a rick in the back of the

262  
00:14:47,509 --> 00:14:44,399  
payload they are getting ready to work

263  
00:14:47,519 --> 00:14:52,949

clay is here too and up on the apr

264

00:14:58,389 --> 00:14:55,750

one of our big tasks on the eva

265

00:15:00,629 --> 00:14:58,399

was to uh

266

00:15:02,629 --> 00:15:00,639

move the ammonia tank assembly and and

267

00:15:04,310 --> 00:15:02,639

part of that required rick and i to go

268

00:15:06,389 --> 00:15:04,320

to the payload bay

269

00:15:07,829 --> 00:15:06,399

and prepare that to be removed and

270

00:15:09,269 --> 00:15:07,839

that's what you're seeing right here

271

00:15:10,069 --> 00:15:09,279

clay's on the left and rick's on the

272

00:15:11,910 --> 00:15:10,079

right

273

00:15:14,470 --> 00:15:11,920

and i'm in a foot restraint so that i

274

00:15:15,829 --> 00:15:14,480

can hold this 1800 pound thing when rick

275

00:15:18,069 --> 00:15:15,839

helps me lift it off and we're going to

276

00:15:20,550 --> 00:15:18,079

hand it to the arm operators

277

00:15:22,790 --> 00:15:20,560

and of course dottie was wonderful today

278

00:15:24,389 --> 00:15:22,800

she's just our quarterback inside the

279

00:15:25,269 --> 00:15:24,399

shuttle and tells us what to do and of

280

00:15:27,269 --> 00:15:25,279

course

281

00:15:28,870 --> 00:15:27,279

she's a former teacher so we do exactly

282

00:15:32,949 --> 00:15:28,880

what she tells us otherwise she might

283

00:15:36,629 --> 00:15:34,710

one of the big teamwork things today was

284

00:15:39,269 --> 00:15:36,639

uh between the robotics team and the eda

285

00:15:41,189 --> 00:15:39,279

team and here you see uh stefan gym

286

00:15:43,990 --> 00:15:41,199

flying the arm and it's really

287

00:15:46,230 --> 00:15:44,000

incredible stephanie did a fantastic job

288

00:15:48,230 --> 00:15:46,240

grappling a moving target

289

00:15:50,230 --> 00:15:48,240

clay within the foot restraint holding

290

00:15:51,269 --> 00:15:50,240

it forward and

291

00:15:53,110 --> 00:15:51,279

essentially

292

00:15:55,030 --> 00:15:53,120

a moving target

293

00:15:56,470 --> 00:15:55,040

with a little motion on it and she just

294

00:15:59,590 --> 00:15:56,480

did a fantastic job moving in for the

295

00:16:05,030 --> 00:16:01,590

yeah it was a lot of fun to work

296

00:16:06,069 --> 00:16:05,040

with clay and rick today and with jim

297

00:16:07,269 --> 00:16:06,079

they

298

00:16:08,949 --> 00:16:07,279

had a little bit of trouble getting the

299

00:16:10,949 --> 00:16:08,959

tank unbolted but uh we're able to

300

00:16:13,430 --> 00:16:10,959

overcome that with their hard work

301  
00:16:16,629 --> 00:16:13,440  
and uh clay was uh holding it up for us

302  
00:16:18,310 --> 00:16:16,639  
nice and uh steady as she goes and

303  
00:16:21,110 --> 00:16:18,320  
we were able to fly it in and get a good

304  
00:16:23,590 --> 00:16:21,120  
grapple and uh towards the end of this

305  
00:16:25,670 --> 00:16:23,600  
uh spacewalk we are stowing the ammonia

306  
00:16:27,269 --> 00:16:25,680  
tank onto the

307  
00:16:29,350 --> 00:16:27,279  
payload accommodations oru as a

308  
00:16:34,790 --> 00:16:29,360  
temporary location and we'll pick up

309  
00:16:39,350 --> 00:16:37,030  
this is jim i think uh the high point

310  
00:16:42,310 --> 00:16:39,360  
for me today was uh when stephanie i had

311  
00:16:44,150 --> 00:16:42,320  
a few pause points during our robotics

312  
00:16:45,749 --> 00:16:44,160  
and that we had a chance to take turns

313  
00:16:47,910 --> 00:16:45,759

sneaking away from the robotic station

314

00:16:50,230 --> 00:16:47,920

down into the cupola and take a look at

315

00:16:51,030 --> 00:16:50,240

the arm and its different configurations

316

00:16:53,590 --> 00:16:51,040

just

317

00:16:56,230 --> 00:16:53,600

you know 10 20 feet out from the windows

318

00:16:59,430 --> 00:16:56,240

the incredible views of the earth going

319

00:17:01,749 --> 00:16:59,440

by behind with some sunsets and

320

00:17:03,110 --> 00:17:01,759

and different land masses passing it was

321

00:17:04,630 --> 00:17:03,120

phenomenal

322

00:17:11,909 --> 00:17:04,640

so

323

00:17:15,189 --> 00:17:13,590

yeah the video continues to show us

324

00:17:17,270 --> 00:17:15,199

working with the ammonia tank you know

325

00:17:18,630 --> 00:17:17,280

took a little bit of work to get it off

326

00:17:19,750 --> 00:17:18,640

the truss

327

00:17:21,510 --> 00:17:19,760

we had a

328

00:17:24,069 --> 00:17:21,520

bolt that didn't want to come on down or

329

00:17:25,829 --> 00:17:24,079

some actually a soft dock that was a lot

330

00:17:27,909 --> 00:17:25,839

harder than it was meant to be but we

331

00:17:29,669 --> 00:17:27,919

were able to lift it up and clay took

332

00:17:34,950 --> 00:17:29,679

that 1800 pounds and held it over his

333

00:17:38,630 --> 00:17:37,029

yeah the uh

334

00:17:40,150 --> 00:17:38,640

it did take a little longer than we

335

00:17:41,669 --> 00:17:40,160

would hoped for but we were still ahead

336

00:17:43,430 --> 00:17:41,679

of the timeline at this point so it

337

00:17:45,430 --> 00:17:43,440

wasn't an issue and again

338

00:17:48,310 --> 00:17:45,440

here's clay holding that 1800 pound

339

00:17:51,830 --> 00:17:48,320

ammonia tank assembly rock solid and

340

00:17:59,350 --> 00:17:54,310

the grapple and uh stephanie moving in

341

00:18:04,390 --> 00:18:01,350

yeah clay did do a nice job holding it

342

00:18:07,590 --> 00:18:04,400

up and uh we were able to fly it in

343

00:18:09,669 --> 00:18:07,600

smoothly and uh get a nice grapple uh

344

00:18:11,909 --> 00:18:09,679

thanks for the hard work also of our eba

345

00:18:14,870 --> 00:18:11,919

and robotics team for this coordination

346

00:18:15,990 --> 00:18:14,880

it's not usual for uh the eva's to have

347

00:18:19,350 --> 00:18:16,000

to hold up

348

00:18:21,110 --> 00:18:19,360

a payload and present it to the arm so

349

00:18:22,870 --> 00:18:21,120

there's a lot of coordination and

350

00:18:25,510 --> 00:18:22,880

handoff between the eva team and the

351  
00:18:27,110 --> 00:18:25,520  
robotics teams and they did a nice job

352  
00:18:38,150 --> 00:18:27,120  
getting those procedures ready for us

353  
00:18:41,669 --> 00:18:39,909  
and actually it's really nice for me to

354  
00:18:43,669 --> 00:18:41,679  
be able to watch this grapple because a

355  
00:18:45,510 --> 00:18:43,679  
lot of the time during this activity i

356  
00:18:47,669 --> 00:18:45,520  
was just watching clearances that we had

357  
00:18:50,310 --> 00:18:47,679  
on the side of the payload bay

358  
00:18:52,390 --> 00:18:50,320  
we had some pretty close cameras and so

359  
00:18:54,070 --> 00:18:52,400  
my job is to make sure that rick and

360  
00:18:56,549 --> 00:18:54,080  
claire is staying safe and keeping the

361  
00:18:57,990 --> 00:18:56,559  
hardware safe and so i did miss the

362  
00:19:00,070 --> 00:18:58,000  
gravel so it was great to actually get

363  
00:19:07,590 --> 00:19:00,080

to see this plate back i'm really glad

364

00:19:11,430 --> 00:19:09,430

and meanwhile all this activity is going

365

00:19:13,430 --> 00:19:11,440

on outside

366

00:19:14,470 --> 00:19:13,440

with the eda teams and the robotics

367

00:19:17,430 --> 00:19:14,480

teams

368

00:19:19,909 --> 00:19:17,440

we also had a team inside really busy

369

00:19:22,549 --> 00:19:19,919

at work in the mplm

370

00:19:24,870 --> 00:19:22,559

and we were able to get

371

00:19:25,830 --> 00:19:24,880

five of our seven racks transferred

372

00:19:27,510 --> 00:19:25,840

today

373

00:19:30,390 --> 00:19:27,520

and uh naoko

374

00:19:32,789 --> 00:19:30,400

did just a a wonderful job uh she worked

375

00:19:34,310 --> 00:19:32,799

with all of us occasionally and a lot

376

00:19:37,430 --> 00:19:34,320

with suici today

377

00:19:39,909 --> 00:19:37,440

uh moving uh moving most of the uh mplm

378

00:19:41,909 --> 00:19:39,919

uh out into the various locations around

379

00:19:43,990 --> 00:19:41,919

the space station and moving a lot of

380

00:19:46,070 --> 00:19:44,000

the return supply

381

00:19:48,470 --> 00:19:46,080

back into place

382

00:19:52,549 --> 00:19:48,480

oh and this view is from cooper how

383

00:19:55,270 --> 00:19:52,559

fantastic the view from troopa is and

384

00:19:58,789 --> 00:19:55,280

while rick and clay are exploring

385

00:20:02,310 --> 00:19:58,799

outside uh soichi and i had a chance to

386

00:20:05,590 --> 00:20:02,320

explore inside the space station

387

00:20:07,590 --> 00:20:05,600

we transferred five rocks today

388

00:20:10,470 --> 00:20:07,600

and two stories locked

389

00:20:13,669 --> 00:20:10,480

to the gym so this would pay our

390

00:20:17,669 --> 00:20:13,679

logistics module and one goal went to

391

00:20:21,110 --> 00:20:17,679

our guest laboratory and one maurice lag

392

00:20:23,669 --> 00:20:21,120

to the columbus module and one creek

393

00:20:25,830 --> 00:20:23,679

water which is our new home for the

394

00:20:27,590 --> 00:20:25,840

state space station through

395

00:20:31,350 --> 00:20:27,600

into the node two

396

00:20:33,510 --> 00:20:31,360

and one melody features -18 further into

397

00:20:36,870 --> 00:20:33,520

the gym laboratory

398

00:20:40,470 --> 00:20:36,880

and some rocks weigh about a thousand

399

00:20:42,549 --> 00:20:40,480

pounds so it is challenging to control a

400

00:20:44,789 --> 00:20:42,559

rock while holding

401  
00:20:50,390 --> 00:20:47,590  
move smoothly and steady

402  
00:20:52,149 --> 00:20:50,400  
so it is a very good combination of the

403  
00:20:56,390 --> 00:20:52,159  
teamwork

404  
00:21:01,990 --> 00:20:58,870  
and uh here's the views in the mplm and

405  
00:21:03,350 --> 00:21:02,000  
here's suichi and naoko

406  
00:21:05,510 --> 00:21:03,360  
they're

407  
00:21:09,750 --> 00:21:05,520  
working on moving another rack and

408  
00:21:14,310 --> 00:21:12,390  
it's a subways get from station so i was

409  
00:21:16,549 --> 00:21:14,320  
really impressed that those guys are a

410  
00:21:17,990 --> 00:21:16,559  
great team that's really efficient to

411  
00:21:21,190 --> 00:21:18,000  
move all the rocks and of course the

412  
00:21:24,470 --> 00:21:21,200  
ebay guys are just great and i was uh

413  
00:21:26,870 --> 00:21:24,480

yeah i see the the mars but coming out

414

00:21:29,350 --> 00:21:26,880

and uh yeah now because like uh yeah

415

00:21:31,110 --> 00:21:29,360

she's like a pro it's just walking

416

00:21:35,430 --> 00:21:31,120

here and there and that was really fun

417

00:21:40,230 --> 00:21:36,870

yeah this is the marriage rack which is

418

00:21:42,149 --> 00:21:40,240

a muscle atrophy uh resistance

419

00:21:44,390 --> 00:21:42,159

science rack and that goes in the

420

00:21:47,029 --> 00:21:44,400

columbus module and again this is a

421

00:21:49,190 --> 00:21:47,039

full-size rack about the size of a

422

00:21:51,750 --> 00:21:49,200

of a large household refrigerator

423

00:21:53,830 --> 00:21:51,760

and it moves through the hatches very

424

00:21:55,750 --> 00:21:53,840

easily but again it has a lot of mass so

425

00:21:57,430 --> 00:21:55,760

once you get it moving it's quite

426  
00:22:00,070 --> 00:21:57,440  
difficult to stop so we have to be

427  
00:22:00,950 --> 00:22:00,080  
careful not to not to hit anything

428  
00:22:02,789 --> 00:22:00,960  
and

429  
00:22:05,190 --> 00:22:02,799  
we come out of the

430  
00:22:14,549 --> 00:22:05,200  
out of the mplm and turn it 90 degrees

431  
00:22:19,990 --> 00:22:17,190  
yeah it was very fun to see uh

432  
00:22:22,630 --> 00:22:20,000  
working with the transfer and also suici

433  
00:22:25,270 --> 00:22:22,640  
and the help of the spacing crew oleg

434  
00:22:27,510 --> 00:22:25,280  
helped us for a while today and the

435  
00:22:29,270 --> 00:22:27,520  
daddy and jim and dex were also involved

436  
00:22:31,669 --> 00:22:29,280  
in transfer so we were able to transfer

437  
00:22:33,029 --> 00:22:31,679  
these racks uh get some of the pre-pack

438  
00:22:37,029 --> 00:22:33,039

that the space station crew has worked

439

00:22:39,270 --> 00:22:37,039

hard to pack for us into the mplm and

440

00:22:42,549 --> 00:22:39,280

we have also started to offload some of

441

00:22:44,390 --> 00:22:42,559

the resupply so it's a great team and we

442

00:22:47,029 --> 00:22:44,400

are enjoying the mplm it's a great

443

00:22:48,789 --> 00:22:47,039

volume there's already been some

444

00:22:55,350 --> 00:22:48,799

some bungee jumping and some flips in

445

00:22:59,350 --> 00:22:56,710

one of the things that's important to

446

00:23:00,870 --> 00:22:59,360

understand about all this transfer is

447

00:23:03,270 --> 00:23:00,880

the amount of work that went on on the

448

00:23:05,190 --> 00:23:03,280

ground prior to the mission to

449

00:23:07,029 --> 00:23:05,200

you know this is it's like a uh one of

450

00:23:08,870 --> 00:23:07,039

those games we all used to play as kids

451  
00:23:10,789 --> 00:23:08,880  
where you had to move all the squares

452  
00:23:13,510 --> 00:23:10,799  
and look for open holes and it's very

453  
00:23:15,510 --> 00:23:13,520  
choreographed in that we have to move

454  
00:23:17,110 --> 00:23:15,520  
one thing slide something over move

455  
00:23:18,710 --> 00:23:17,120  
something up and pull something back

456  
00:23:20,950 --> 00:23:18,720  
down to get out the piece that we want

457  
00:23:23,190 --> 00:23:20,960  
and then be able to transfer it so a lot

458  
00:23:24,950 --> 00:23:23,200  
of thanks goes out to all the guys and

459  
00:23:26,549 --> 00:23:24,960  
gals on the ground that put so many

460  
00:23:28,950 --> 00:23:26,559  
hours together to make this very

461  
00:23:31,590 --> 00:23:28,960  
choreographed plan that we just go up

462  
00:23:34,230 --> 00:23:31,600  
and execute and and the fact that we're

463  
00:23:37,750 --> 00:23:34,240

way ahead of this transfer timeline is a

464

00:23:40,310 --> 00:23:37,760

testimony to their great work

465

00:23:42,870 --> 00:23:40,320

uh this is uh

466

00:23:44,390 --> 00:23:42,880

not a rotated video uh

467

00:23:46,230 --> 00:23:44,400

i it sometimes when you come into a

468

00:23:47,669 --> 00:23:46,240

module it's difficult to tell which

469

00:23:50,390 --> 00:23:47,679

direction uh

470

00:23:52,390 --> 00:23:50,400

is the deck and which direction is uh is

471

00:23:54,630 --> 00:23:52,400

up and uh in space it really isn't

472

00:23:56,470 --> 00:23:54,640

enough you can work in any orientation

473

00:23:58,630 --> 00:23:56,480

but this is jim and stephanie

474

00:24:00,390 --> 00:23:58,640

at the robotics workstation in the lab

475

00:24:01,269 --> 00:24:00,400

and uh they're moving the ammonia tank

476

00:24:10,070 --> 00:24:01,279

uh

477

00:24:11,590 --> 00:24:10,080

and they just did great work again this

478

00:24:13,830 --> 00:24:11,600

is all happening while we're moving

479

00:24:15,909 --> 00:24:13,840

racks around and while dottie is up on

480

00:24:17,990 --> 00:24:15,919

the flight deck coordinating the eva

481

00:24:18,870 --> 00:24:18,000

with the ground with the team outside

482

00:24:21,190 --> 00:24:18,880

again

483

00:24:24,070 --> 00:24:21,200

just terrific work by everybody involved

484

00:24:25,990 --> 00:24:24,080

the ground uh we've really we had just a

485

00:24:27,269 --> 00:24:26,000

great team work all day and it just

486

00:24:31,510 --> 00:24:27,279

shows that

487

00:24:33,510 --> 00:24:31,520

good good planning and expert expert

488

00:24:35,190 --> 00:24:33,520

technical planning from the from the

489

00:24:39,029 --> 00:24:35,200

teams on the ground and

490

00:25:20,549 --> 00:24:40,310

there's some more work in the robotics

491

00:25:25,669 --> 00:25:23,909

this looks like some video of

492

00:25:27,269 --> 00:25:25,679

us outside we get the tail end of our

493

00:25:29,269 --> 00:25:27,279

feet

494

00:28:21,909 --> 00:25:29,279

as we translate from one work site to

495

00:28:26,389 --> 00:28:23,909

again i just can't say it enough uh what

496

00:28:28,230 --> 00:28:26,399

what great teamwork uh

497

00:28:29,909 --> 00:28:28,240

that we saw all day today

498

00:28:31,190 --> 00:28:29,919

all around the space station and shuttle

499

00:28:32,310 --> 00:28:31,200

complex

500

00:28:33,830 --> 00:28:32,320

on the ground

501  
00:28:34,710 --> 00:28:33,840  
we just got a tremendous amount of work

502  
00:28:35,669 --> 00:28:34,720  
done

503  
00:28:37,590 --> 00:28:35,679  
and

504  
00:28:45,110 --> 00:28:37,600  
it's just phenomenal to see this team in

505  
00:28:48,630 --> 00:28:46,870  
after a hard day's work it was nice to

506  
00:28:50,310 --> 00:28:48,640  
be able to greet rick and clay as they

507  
00:28:52,549 --> 00:28:50,320  
were coming inside

508  
00:28:54,710 --> 00:28:52,559  
uh handshakes and hugs all around for

509  
00:28:56,470 --> 00:28:54,720  
the fantastic job that they did

510  
00:28:58,230 --> 00:28:56,480  
and uh

511  
00:29:00,549 --> 00:28:58,240  
and dottie also uh

512  
00:29:02,149 --> 00:29:00,559  
orchestrating the uh space walk and

513  
00:29:04,789 --> 00:29:02,159

leading them through setting up the