
Space C
Center

1
00:00:05,110 --> 00:00:03,510
good afternoon everybody from the

2
00:00:06,869 --> 00:00:05,120
johnson space center here in houston

3
00:00:08,710 --> 00:00:06,879
texas i'm nasa's josh byerly we're going

4
00:00:10,950 --> 00:00:08,720
to be taking a look today at a spacewalk

5
00:00:12,950 --> 00:00:10,960
that is planned for november 1st where

6
00:00:16,070 --> 00:00:12,960
suni williams and aki hoshide will step

7
00:00:17,910 --> 00:00:16,080
outside to the p6 radiator and correct

8
00:00:18,870 --> 00:00:17,920
an ammonia leak that has been spotted

9
00:00:20,950 --> 00:00:18,880
out there on the very end of the

10
00:00:23,029 --> 00:00:20,960
station's truss structure here to give

11
00:00:24,550 --> 00:00:23,039
us more details about all this activity

12
00:00:26,870 --> 00:00:24,560
is the international space station

13
00:00:28,790 --> 00:00:26,880

program manager mike sufferdini as well

14
00:00:30,470 --> 00:00:28,800
as mike lammers who is the nasa flight

15
00:00:32,870 --> 00:00:30,480
director who will be inside mission

16
00:00:35,430 --> 00:00:32,880
control during the activities as well as

17
00:00:37,110 --> 00:00:35,440
allison bolinger a spacewalk officer who

18
00:00:39,750 --> 00:00:37,120
she and her team have choreographed the

19
00:00:41,190 --> 00:00:39,760
activities for sunny and aki we'll get

20
00:00:43,030 --> 00:00:41,200
started with mike

21
00:00:45,270 --> 00:00:43,040
well good afternoon as josh said we're

22
00:00:47,670 --> 00:00:45,280
here to talk to you today at the outset

23
00:00:50,229 --> 00:00:47,680
of a an eva

24
00:00:52,229 --> 00:00:50,239
we have been working on a number of uh

25
00:00:54,310 --> 00:00:52,239
of power problems over the last several

26
00:00:55,750 --> 00:00:54,320
weeks since everyone's been following

27
00:00:57,350 --> 00:00:55,760
along

28
00:01:00,470 --> 00:00:57,360
we had

29
00:01:02,549 --> 00:01:00,480
the 3 a solar ray

30
00:01:03,910 --> 00:01:02,559
set was not

31
00:01:08,149 --> 00:01:03,920
in the

32
00:01:10,230 --> 00:01:08,159
providing capability that the space

33
00:01:12,950 --> 00:01:10,240
station had because of a short that we

34
00:01:14,710 --> 00:01:12,960
experienced several weeks ago

35
00:01:17,670 --> 00:01:14,720
the team over the

36
00:01:20,149 --> 00:01:17,680
course of a number of days slowly

37
00:01:23,590 --> 00:01:20,159
reintegrated that system into

38
00:01:24,870 --> 00:01:23,600

into the set and it's back with us now

39
00:01:26,390 --> 00:01:24,880
we

40
00:01:28,310 --> 00:01:26,400
actually don't know the

41
00:01:29,030 --> 00:01:28,320
root cause we believe the root cause to

42
00:01:32,550 --> 00:01:29,040
be

43
00:01:34,310 --> 00:01:32,560
uh perhaps the short of a one of uh 82

44
00:01:35,830 --> 00:01:34,320
capacitors in the

45
00:01:38,630 --> 00:01:35,840
in the ssu

46
00:01:41,270 --> 00:01:38,640
uh as a result of that short it's uh we

47
00:01:43,109 --> 00:01:41,280
believe that we we basically burned out

48
00:01:45,830 --> 00:01:43,119
the capacitor

49
00:01:48,310 --> 00:01:45,840
and and so now the short is gone uh the

50
00:01:50,149 --> 00:01:48,320
system the capacitors use for power

51
00:01:53,109 --> 00:01:50,159
power quality purposes

52
00:01:55,030 --> 00:01:53,119
uh and uh missing one of 82 will not

53
00:01:57,190 --> 00:01:55,040
really affect the power quality so we

54
00:01:59,030 --> 00:01:57,200
believe we're in a good

55
00:02:01,350 --> 00:01:59,040
place with the three array and now we

56
00:02:03,429 --> 00:02:01,360
have all eight channels providing power

57
00:02:05,270 --> 00:02:03,439
to the iss

58
00:02:07,510 --> 00:02:05,280
that's the good news the bad news is

59
00:02:09,510 --> 00:02:07,520
over the last several weeks we have been

60
00:02:11,110 --> 00:02:09,520
watching well

61
00:02:12,790 --> 00:02:11,120
the p6 array

62
00:02:14,309 --> 00:02:12,800
since it's been on orbit has had a very

63
00:02:16,070 --> 00:02:14,319

very slow leak that we have been

64
00:02:17,190 --> 00:02:16,080
monitoring as you may recall about a

65
00:02:19,750 --> 00:02:17,200
year ago

66
00:02:22,630 --> 00:02:19,760
we recharged one of the

67
00:02:24,470 --> 00:02:22,640
systems out there because of this leak

68
00:02:26,150 --> 00:02:24,480
that's a normal capability that we have

69
00:02:28,710 --> 00:02:26,160
on iss

70
00:02:30,229 --> 00:02:28,720
the leak is is amazingly slow you

71
00:02:32,390 --> 00:02:30,239
couldn't see it if you were sitting on

72
00:02:34,390 --> 00:02:32,400
top of it and so really the better part

73
00:02:36,070 --> 00:02:34,400
of valor is just let the system

74
00:02:37,589 --> 00:02:36,080
slowly leak down and recharge it as

75
00:02:39,589 --> 00:02:37,599
we've done

76
00:02:41,589 --> 00:02:39,599
that process was to occur about once

77
00:02:43,030 --> 00:02:41,599
every four or five years

78
00:02:45,190 --> 00:02:43,040
and since we're

79
00:02:47,670 --> 00:02:45,200
outside for evas every so often anyway

80
00:02:50,229 --> 00:02:47,680
that was the right position to be in

81
00:02:51,910 --> 00:02:50,239
however in about the june time frame we

82
00:02:53,430 --> 00:02:51,920
noticed that the leak rate picked up

83
00:02:54,309 --> 00:02:53,440
substantially

84
00:03:00,070 --> 00:02:54,319
and

85
00:03:02,070 --> 00:03:00,080
talking about a very slow leak

86
00:03:03,030 --> 00:03:02,080
in terms of leaks in general and so it

87
00:03:07,589 --> 00:03:03,040
takes

88
00:03:09,270 --> 00:03:07,599

weeks if not months to decide exactly

89
00:03:11,270 --> 00:03:09,280
what the leak rate is

90
00:03:14,149 --> 00:03:11,280
in a system like this that also not only

91
00:03:15,910 --> 00:03:14,159
is it got a very very slow leak we go

92
00:03:18,309 --> 00:03:15,920
through temperature changes regularly in

93
00:03:20,550 --> 00:03:18,319
these loops and so it's very hard to to

94
00:03:21,670 --> 00:03:20,560
get the actual

95
00:03:23,430 --> 00:03:21,680
leak rate

96
00:03:25,910 --> 00:03:23,440
without quite a bit of trend data but

97
00:03:26,789 --> 00:03:25,920
anyway over two or three months

98
00:03:28,470 --> 00:03:26,799
we

99
00:03:30,149 --> 00:03:28,480
determined that the leak rate was such

100
00:03:32,869 --> 00:03:30,159
that we'd get low enough that the system

101
00:03:35,910 --> 00:03:32,879
would shut itself down probably in the

102
00:03:38,149 --> 00:03:35,920
late december early january time frame

103
00:03:40,149 --> 00:03:38,159
since that time as we've continued to

104
00:03:42,630 --> 00:03:40,159
watch the leak it looks like we could

105
00:03:44,789 --> 00:03:42,640
probably go another month or two

106
00:03:46,309 --> 00:03:44,799
but but the data does indicate that

107
00:03:47,509 --> 00:03:46,319
we're going to leak down to a point

108
00:03:49,030 --> 00:03:47,519
where we will

109
00:03:50,789 --> 00:03:49,040
eventually have the system will shut

110
00:03:53,350 --> 00:03:50,799
down to protect itself

111
00:03:57,589 --> 00:03:53,360
and so the decision has been made

112
00:03:59,910 --> 00:03:57,599
to go ahead and send sunny anaki outside

113
00:04:02,229 --> 00:03:59,920

we don't know exactly where the leak is

114
00:04:03,830 --> 00:04:02,239
it's it's possible the leak is

115
00:04:05,990 --> 00:04:03,840
uh in the uh

116
00:04:08,550 --> 00:04:06,000
in the pvr itself the radiator itself it

117
00:04:11,830 --> 00:04:08,560
could be in the pump system or it could

118
00:04:13,429 --> 00:04:11,840
be in any one of the lines and so

119
00:04:15,190 --> 00:04:13,439
a leak rate this small it's not like you

120
00:04:16,789 --> 00:04:15,200
can just take something out of the set

121
00:04:18,390 --> 00:04:16,799
while the crew is outside and then have

122
00:04:19,749 --> 00:04:18,400
them wait a couple minutes and you see

123
00:04:21,430 --> 00:04:19,759
where the leak is fixed or not and then

124
00:04:23,350 --> 00:04:21,440
you go work on the next thing

125
00:04:24,710 --> 00:04:23,360
as i said before it takes weeks maybe

126
00:04:26,629 --> 00:04:24,720
months to see

127
00:04:28,469 --> 00:04:26,639
if you've affected the leak rake

128
00:04:29,909 --> 00:04:28,479
so the first thing we're going to do and

129
00:04:32,390 --> 00:04:29,919
and uh

130
00:04:34,870 --> 00:04:32,400
we'll talk about it more here uh with

131
00:04:38,070 --> 00:04:34,880
the folks on the panel with me but um

132
00:04:40,230 --> 00:04:38,080
uh the the odd object here is to go

133
00:04:42,870 --> 00:04:40,240
hook up to another array we have that's

134
00:04:45,110 --> 00:04:42,880
out there on the p6 truss um and was

135
00:04:46,390 --> 00:04:45,120
utilized as we call it the early system

136
00:04:48,070 --> 00:04:46,400
way back in the

137
00:04:49,430 --> 00:04:48,080
in the day when we first started flying

138
00:04:51,749 --> 00:04:49,440

the space station

139
00:04:53,189 --> 00:04:51,759
and and then see uh we can operate the

140
00:04:54,710 --> 00:04:53,199
loop this way so we'll operate the

141
00:04:56,710 --> 00:04:54,720
channel this way and see if the leak

142
00:04:59,110 --> 00:04:56,720
stays with us or not and then based on

143
00:05:01,189 --> 00:04:59,120
what that tells us we'll decide if we

144
00:05:03,510 --> 00:05:01,199
have to do anything else outside it's

145
00:05:04,469 --> 00:05:03,520
conceivable that if the leak is in the

146
00:05:06,070 --> 00:05:04,479
in the

147
00:05:07,990 --> 00:05:06,080
radiator itself

148
00:05:09,670 --> 00:05:08,000
we could just stay in this configuration

149
00:05:11,510 --> 00:05:09,680
and operate off the

150
00:05:13,270 --> 00:05:11,520
off the radiator that's uh was

151
00:05:15,430 --> 00:05:13,280
originally intended for the early

152
00:05:17,350 --> 00:05:15,440
ammonia system

153
00:05:19,909 --> 00:05:17,360
so that's what we're uh going to go

154
00:05:22,469 --> 00:05:19,919
outside to to tackle here in the next

155
00:05:24,070 --> 00:05:22,479
few days actually november 1st

156
00:05:27,029 --> 00:05:24,080
between now and then of course we've

157
00:05:30,070 --> 00:05:27,039
just uh got the the next crew on board

158
00:05:32,469 --> 00:05:30,080
uh with us the next crew and and fish

159
00:05:36,390 --> 00:05:32,479
are on board with us and and uh everyone

160
00:05:38,870 --> 00:05:36,400
is doing well including the fri the fish

161
00:05:41,430 --> 00:05:38,880
we have our next major operation on

162
00:05:42,550 --> 00:05:41,440
board iss is the return of the dragon

163
00:05:45,029 --> 00:05:42,560

capsule

164
00:05:46,710 --> 00:05:45,039
uh that returns on sunday uh with i

165
00:05:49,670 --> 00:05:46,720
think we release it about 8 26 in the

166
00:05:52,469 --> 00:05:49,680
morning central time sunday and it lands

167
00:05:54,230 --> 00:05:52,479
or splashes down i think about 2 20ish

168
00:05:55,670 --> 00:05:54,240
in the afternoon that day at least

169
00:05:57,510 --> 00:05:55,680
that's the current plan so this all

170
00:05:58,309 --> 00:05:57,520
occurs on sunday

171
00:06:01,189 --> 00:05:58,319
then

172
00:06:03,909 --> 00:06:01,199
right before the eva on the 31st the 49

173
00:06:05,749 --> 00:06:03,919
progress will launch into a four orbit

174
00:06:07,990 --> 00:06:05,759
rendezvous station

175
00:06:09,590 --> 00:06:08,000
and so it'll launch and dock on the 31st

176
00:06:11,749 --> 00:06:09,600
and then of course the next day after

177
00:06:14,070 --> 00:06:11,759
that we'll do the eva so we've got a

178
00:06:15,670 --> 00:06:14,080
pretty busy period

179
00:06:18,629 --> 00:06:15,680
but this is the right time to do this

180
00:06:21,029 --> 00:06:18,639
eva sunny and aki both have just been

181
00:06:23,670 --> 00:06:21,039
outside the suits are all sized for them

182
00:06:25,189 --> 00:06:23,680
they have experience um of course very

183
00:06:28,070 --> 00:06:25,199
recent experience

184
00:06:29,749 --> 00:06:28,080
outside sunny actually helped stow this

185
00:06:31,749 --> 00:06:29,759
these partic this particular radiator

186
00:06:33,510 --> 00:06:31,759
that we're going to deploy and has quite

187
00:06:36,950 --> 00:06:33,520
a bit of experience with these qd's that

188
00:06:38,710 --> 00:06:36,960

we have to manipulate outside and so

189
00:06:40,950 --> 00:06:38,720
for those reasons we think it makes

190
00:06:43,270 --> 00:06:40,960
sense to go ahead and let them go out uh

191
00:06:45,590 --> 00:06:43,280
before they come home and take care of

192
00:06:47,670 --> 00:06:45,600
this for us so that's that's the that's

193
00:06:50,550 --> 00:06:47,680
the intent so with that i'll hand it off

194
00:06:53,270 --> 00:06:50,560
to my cool go into more detail on the

195
00:06:59,110 --> 00:06:56,950
okay thanks mike um eva 20 will be on

196
00:07:01,830 --> 00:06:59,120
thursday november 1st as mike mentioned

197
00:07:04,150 --> 00:07:01,840
the egress will be at 7 15

198
00:07:06,309 --> 00:07:04,160
a.m central time and eva is expected to

199
00:07:08,309 --> 00:07:06,319
last nominally about six and a half

200
00:07:10,150 --> 00:07:08,319
hours

201
00:07:11,670 --> 00:07:10,160
just a review of our crew that's on

202
00:07:15,110 --> 00:07:11,680
board

203
00:07:17,749 --> 00:07:15,120
we have sunny williams aki hoshide and

204
00:07:21,110 --> 00:07:17,759
yuri malenchenko and they came up on

205
00:07:25,270 --> 00:07:21,120
soyuz tma-5m which was launched on

206
00:07:27,909 --> 00:07:25,280
december sorry july 14th dr rosfet on

207
00:07:31,110 --> 00:07:27,919
july 17th and the eva will occur in

208
00:07:33,670 --> 00:07:31,120
their 107th day on board of iss

209
00:07:36,150 --> 00:07:33,680
and of course we just uh

210
00:07:39,430 --> 00:07:36,160
acquired a new crew kevin ford oleg

211
00:07:42,230 --> 00:07:39,440
novitskiy and evgeny tarelkin and they

212
00:07:44,710 --> 00:07:42,240
launched on soyuz tma 6m

213
00:07:46,710 --> 00:07:44,720

back on the 23rd they docked to poisk

214
00:07:47,670 --> 00:07:46,720
yesterday morning and the eva will occur

215
00:07:50,790 --> 00:07:47,680
on their

216
00:07:52,390 --> 00:07:50,800
seventh day in space

217
00:07:55,909 --> 00:07:52,400
just to review the current config of the

218
00:07:58,710 --> 00:07:55,919
vehicle actually the config of the eva

219
00:08:00,790 --> 00:07:58,720
progress 48 will be on the nader side at

220
00:08:03,749 --> 00:08:00,800
the piers docking module

221
00:08:06,710 --> 00:08:03,759
soyuz tma-5m as i mentioned is at

222
00:08:11,029 --> 00:08:06,720
rossfett on the nader side of the fgb

223
00:08:14,230 --> 00:08:11,039
soyuz tma-6sm is docked at poisk and

224
00:08:14,950 --> 00:08:14,240
uh progress 49 will arrive at the sm aft

225
00:08:18,230 --> 00:08:14,960
uh

226
00:08:21,029 --> 00:08:18,240
about 24 hours before the um

227
00:08:23,430 --> 00:08:21,039
the eva and that's again a four orbit uh

228
00:08:26,390 --> 00:08:23,440
launch in dock

229
00:08:28,790 --> 00:08:26,400
just kind of a an overview of of uh the

230
00:08:31,029 --> 00:08:28,800
power system on board iss and mike did a

231
00:08:33,670 --> 00:08:31,039
really excellent job of uh kind of

232
00:08:36,149 --> 00:08:33,680
describing the issues that uh

233
00:08:37,589 --> 00:08:36,159
we're working with the

234
00:08:39,909 --> 00:08:37,599
we have eight power channels on board

235
00:08:41,670 --> 00:08:39,919
the iss and uh it's basically one for

236
00:08:42,389 --> 00:08:41,680
each one of those solar arrays that you

237
00:08:43,750 --> 00:08:42,399
see

238
00:08:45,750 --> 00:08:43,760

and of course as we go through the

239
00:08:47,750 --> 00:08:45,760
eclipse period in the orbit we uh we

240
00:08:49,269 --> 00:08:47,760
have a pretty good

241
00:08:50,870 --> 00:08:49,279
complement of batteries and other

242
00:08:53,110 --> 00:08:50,880
equipment that gives us power when we're

243
00:08:55,030 --> 00:08:53,120
going through the earth's shadow

244
00:08:57,350 --> 00:08:55,040
each one of those eight channels has its

245
00:08:59,269 --> 00:08:57,360
own um cooling system and it's actually

246
00:09:01,430 --> 00:08:59,279
separate from sort of the big cooling

247
00:09:03,269 --> 00:09:01,440
systems on board the vehicle that

248
00:09:05,750 --> 00:09:03,279
we had to repair with an eva a few years

249
00:09:07,509 --> 00:09:05,760
ago i call it sort of the little brother

250
00:09:09,829 --> 00:09:07,519
there's eight of them each one consists

251
00:09:11,990 --> 00:09:09,839
of of a pump

252
00:09:13,990 --> 00:09:12,000
also known as the pfcs the pump flow

253
00:09:15,670 --> 00:09:14,000
control

254
00:09:16,710 --> 00:09:15,680
system that's got a pump and some valves

255
00:09:19,030 --> 00:09:16,720
in it

256
00:09:20,630 --> 00:09:19,040
there's a radiator to cool the ammonia

257
00:09:21,990 --> 00:09:20,640
and you can see that

258
00:09:24,150 --> 00:09:22,000
going out towards the bottom of the

259
00:09:26,710 --> 00:09:24,160
screen there and then a series of tubes

260
00:09:27,829 --> 00:09:26,720
and cold plates to uh to pick up the

261
00:09:32,470 --> 00:09:27,839
heat

262
00:09:34,150 --> 00:09:32,480
each photovoltaic module p6 p4 s4 and

263
00:09:36,310 --> 00:09:34,160

s6

264
00:09:37,910 --> 00:09:36,320
each has two power channels and as i

265
00:09:41,750 --> 00:09:37,920
described two

266
00:09:42,710 --> 00:09:41,760
photovoltaic thermal control systems

267
00:09:44,150 --> 00:09:42,720
and

268
00:09:46,470 --> 00:09:44,160
they're separate there's eight of them

269
00:09:48,790 --> 00:09:46,480
but kind of one of the

270
00:09:50,870 --> 00:09:48,800
details is that radiator is shared

271
00:09:53,590 --> 00:09:50,880
between two systems so what you see

272
00:09:56,550 --> 00:09:53,600
there with that one radiator it's got

273
00:09:59,670 --> 00:09:56,560
the tubing for uh all the p6 for both

274
00:10:02,310 --> 00:09:59,680
the two bravo power channel which we're

275
00:10:04,230 --> 00:10:02,320
looking at uh fixing here and for bravo

276
00:10:05,430 --> 00:10:04,240
and so uh the systems are separate but

277
00:10:07,750 --> 00:10:05,440
they go through that

278
00:10:10,949 --> 00:10:07,760
same radiator

279
00:10:13,750 --> 00:10:10,959
again we mentioned the two bravo's on p6

280
00:10:17,110 --> 00:10:13,760
that's way out there on the port side

281
00:10:19,430 --> 00:10:17,120
and that was the first

282
00:10:20,790 --> 00:10:19,440
array that was launched a number of

283
00:10:22,230 --> 00:10:20,800
years ago and if you remember it

284
00:10:24,630 --> 00:10:22,240
actually used to live

285
00:10:25,590 --> 00:10:24,640
up on the zenith side of the vehicle

286
00:10:34,350 --> 00:10:25,600
and

287
00:10:36,150 --> 00:10:34,360
p5 where it currently lives as part of

288
00:10:40,470 --> 00:10:36,160

289
00:10:43,910 --> 00:10:42,069
so as mike mentioned

290
00:10:47,670 --> 00:10:43,920
you know we've had this very

291
00:10:49,350 --> 00:10:47,680
slow leak on the pvtcs since 2007 and

292
00:10:51,670 --> 00:10:49,360
again i like to sort of characterize it

293
00:10:53,269 --> 00:10:51,680
as as a as a leak that i had my air

294
00:10:55,509 --> 00:10:53,279
conditioning system

295
00:10:57,030 --> 00:10:55,519
uh a number of years ago where it's

296
00:10:59,030 --> 00:10:57,040
about every two years i got to put more

297
00:11:01,269 --> 00:10:59,040
freon on the system and it's not

298
00:11:03,269 --> 00:11:01,279
something that's immediately obvious

299
00:11:05,509 --> 00:11:03,279
and again something if it's slow enough

300
00:11:07,350 --> 00:11:05,519
that we can go ahead and feed

301
00:11:08,870 --> 00:11:07,360
and if you go ahead and look at the next

302
00:11:10,069 --> 00:11:08,880
slide here

303
00:11:12,870 --> 00:11:10,079
this is actually a really good

304
00:11:14,230 --> 00:11:12,880
comparison of uh the two bravo channel

305
00:11:15,829 --> 00:11:14,240
which is the one with the leak and the

306
00:11:18,150 --> 00:11:15,839
four bravo

307
00:11:20,710 --> 00:11:18,160
which is in blue and has been

308
00:11:22,949 --> 00:11:20,720
tight and you can see that we normally

309
00:11:23,990 --> 00:11:22,959
run just over 50 pounds of ammonia in

310
00:11:26,150 --> 00:11:24,000
the system

311
00:11:29,030 --> 00:11:26,160
and you can see as we trend it out over

312
00:11:31,269 --> 00:11:29,040
several years we have a very

313
00:11:33,030 --> 00:11:31,279

slow leak and again it's really

314
00:11:34,870 --> 00:11:33,040
you need to look at it over weeks and

315
00:11:36,630 --> 00:11:34,880
months to sort of determine what the

316
00:11:38,949 --> 00:11:36,640
trend is

317
00:11:40,790 --> 00:11:38,959
you can see over there towards the right

318
00:11:42,710 --> 00:11:40,800
where we actually did the recharge on

319
00:11:46,550 --> 00:11:42,720
sts-134

320
00:11:48,630 --> 00:11:46,560
and that was done on eva 2 with

321
00:11:51,350 --> 00:11:48,640
drew feustel and mike fink

322
00:11:54,310 --> 00:11:51,360
they put 8 pounds into the system

323
00:11:55,910 --> 00:11:54,320
both drew and mike have been really

324
00:11:58,150 --> 00:11:55,920
a great asset they've been helping us a

325
00:11:59,190 --> 00:11:58,160
lot with this eva and mike will actually

326
00:12:00,389 --> 00:11:59,200
be the

327
00:12:03,030 --> 00:12:00,399
capcom

328
00:12:04,790 --> 00:12:03,040
during the eva sitting to my right

329
00:12:08,230 --> 00:12:04,800
again you can see on the right side of

330
00:12:09,509 --> 00:12:08,240
that that we saw an increase in the rate

331
00:12:11,750 --> 00:12:09,519
and

332
00:12:13,750 --> 00:12:11,760
you know if you look at the conservative

333
00:12:16,150 --> 00:12:13,760
sort of worst case as mike mentioned

334
00:12:17,910 --> 00:12:16,160
it'd be in early uh next year that we'd

335
00:12:20,230 --> 00:12:17,920
hit the minimum they tell me the

336
00:12:22,870 --> 00:12:20,240
minimums about on that chart calibrated

337
00:12:25,590 --> 00:12:22,880
that chart is about 40 pounds um and

338
00:12:28,069 --> 00:12:25,600

again it's it the trick is it it takes

339
00:12:33,670 --> 00:12:28,079
some time to uh to trend that line and

340
00:12:37,829 --> 00:12:35,910
uh so kind of on a big picture of the

341
00:12:39,269 --> 00:12:37,839
eva and allison will

342
00:12:41,269 --> 00:12:39,279
has got some great graphics that she'll

343
00:12:43,110 --> 00:12:41,279
go through but again we mentioned that

344
00:12:44,150 --> 00:12:43,120
the leak is most likely

345
00:12:45,269 --> 00:12:44,160
in

346
00:12:46,230 --> 00:12:45,279
either the

347
00:12:49,990 --> 00:12:46,240
the

348
00:12:51,670 --> 00:12:50,000
radiator

349
00:12:53,590 --> 00:12:51,680
they're both oru's they both can be

350
00:12:55,670 --> 00:12:53,600
isolated from the systems

351
00:12:57,910 --> 00:12:55,680
we're real suspicious of the the

352
00:12:59,030 --> 00:12:57,920
radiator just because of you saw it kind

353
00:13:02,389 --> 00:12:59,040
of stretches out there and it's

354
00:13:04,710 --> 00:13:02,399
susceptible to micrometeoroid impacts

355
00:13:07,829 --> 00:13:04,720
and again the goal of this eva is to

356
00:13:11,590 --> 00:13:07,839
isolate the pvr from the system by

357
00:13:13,269 --> 00:13:11,600
closing an eva actuated disconnect

358
00:13:14,710 --> 00:13:13,279
you know what by doing that and kind of

359
00:13:16,790 --> 00:13:14,720
watching the quantity that's in the

360
00:13:18,870 --> 00:13:16,800
radiator that's cut off from the rest of

361
00:13:20,389 --> 00:13:18,880
the system as well as the remainder of

362
00:13:22,389 --> 00:13:20,399
the system we can

363
00:13:27,269 --> 00:13:22,399

kind of determine if that leak is in the

364
00:13:31,509 --> 00:13:29,829
as uh as mike mentioned we we have a

365
00:13:33,990 --> 00:13:31,519
spare radiator and the way that we'll

366
00:13:36,069 --> 00:13:34,000
use that spare radiators we'll

367
00:13:38,470 --> 00:13:36,079
we'll use these jumpers

368
00:13:41,670 --> 00:13:38,480
that were used to help fill

369
00:13:45,110 --> 00:13:41,680
on 134 and we will connect up

370
00:13:47,590 --> 00:13:45,120
that spare radiator to the tube bravo

371
00:13:50,150 --> 00:13:47,600
cooling system and those jumpers are

372
00:13:51,829 --> 00:13:50,160
actually um dry now there's no ammonia

373
00:13:53,670 --> 00:13:51,839
in them we'll just get them into the

374
00:13:55,990 --> 00:13:53,680
right position and we'll go ahead and

375
00:13:57,670 --> 00:13:56,000
open them up and that will just tie

376
00:13:59,750 --> 00:13:57,680
um the current

377
00:14:03,430 --> 00:13:59,760
cooling system to that

378
00:14:05,350 --> 00:14:03,440
to that extra radiator that we have

379
00:14:08,389 --> 00:14:05,360
that spare radiator again was part of

380
00:14:10,470 --> 00:14:08,399
the old eetcs or the early external

381
00:14:13,189 --> 00:14:10,480
thermal control system that was used

382
00:14:16,230 --> 00:14:13,199
primarily when when that truss was up on

383
00:14:18,150 --> 00:14:16,240
the zenith side of the vehicle

384
00:14:24,150 --> 00:14:18,160
we deactivated that in the winter of

385
00:14:26,310 --> 00:14:24,160
2006 and 2007 and uh during eva 7

386
00:14:29,189 --> 00:14:26,320
we put that radiator away

387
00:14:31,750 --> 00:14:29,199
that eva was done by mike lopez alegria

388
00:14:34,629 --> 00:14:31,760

and conveniently enough suni williams

389
00:14:36,310 --> 00:14:34,639
who will be doing this eva and it's been

390
00:14:37,990 --> 00:14:36,320
real helpful to get her take and what

391
00:14:40,389 --> 00:14:38,000
she remembers and it's she remembers

392
00:14:41,750 --> 00:14:40,399
quite a bit about the work site and

393
00:14:42,790 --> 00:14:41,760
her experience with putting that

394
00:14:44,710 --> 00:14:42,800
radiator

395
00:14:46,150 --> 00:14:44,720
away

396
00:14:48,150 --> 00:14:46,160
um

397
00:14:50,389 --> 00:14:48,160
and uh we

398
00:14:51,670 --> 00:14:50,399
uh it's just real nice video of course

399
00:14:53,990 --> 00:14:51,680
we'll be going in the reverse direction

400
00:14:56,310 --> 00:14:54,000
when we do the eva itself maybe

401
00:14:57,910 --> 00:14:56,320
but um again if the leak was in the in

402
00:14:59,430 --> 00:14:57,920
the pvr

403
00:15:01,509 --> 00:14:59,440
and we got that new radiator on the

404
00:15:04,150 --> 00:15:01,519
system we can leave it there uh long

405
00:15:06,949 --> 00:15:04,160
term um even if we don't isolate the

406
00:15:09,110 --> 00:15:06,959
leak that old system has got quite a bit

407
00:15:10,470 --> 00:15:09,120
of additional ammonia in it and of

408
00:15:12,790 --> 00:15:10,480
course when the systems are tied

409
00:15:14,389 --> 00:15:12,800
together they'll uh they'll uh will

410
00:15:16,710 --> 00:15:14,399
essentially get a free recharge out of

411
00:15:18,629 --> 00:15:16,720
the system which can also buy us

412
00:15:20,629 --> 00:15:18,639
quite a bit more runtime

413
00:15:22,069 --> 00:15:20,639

while we evaluate the next steps if we

414
00:15:24,710 --> 00:15:22,079
continue to

415
00:15:26,629 --> 00:15:24,720
monitor a slow slow leak there

416
00:15:28,949 --> 00:15:26,639
so that's sort of the big picture of the

417
00:15:31,030 --> 00:15:28,959
current state of the power system and uh

418
00:15:31,990 --> 00:15:31,040
and our overall goals for the eva and of

419
00:15:34,389 --> 00:15:32,000
course uh

420
00:15:36,230 --> 00:15:34,399
allison bollinger has been doing just a

421
00:15:37,910 --> 00:15:36,240
outstanding job with her team putting

422
00:15:39,829 --> 00:15:37,920
together a really a

423
00:15:41,189 --> 00:15:39,839
really well put together eva and we've

424
00:15:43,030 --> 00:15:41,199
gotten tremendous help from the

425
00:15:45,269 --> 00:15:43,040
engineering community

426
00:15:46,790 --> 00:15:45,279
as well and and just just everyone's

427
00:15:48,470 --> 00:15:46,800
been outstanding so i'll give it off to

428
00:15:49,829 --> 00:15:48,480
uh allison you can tell us all about it

429
00:15:51,670 --> 00:15:49,839
all right thanks mike

430
00:15:54,310 --> 00:15:51,680
so as mike and mike have both mentioned

431
00:15:56,389 --> 00:15:54,320
our eva is next thursday november 1st

432
00:15:59,030 --> 00:15:56,399
with an egress time of approximately 7

433
00:16:01,350 --> 00:15:59,040
15 a.m the two crew members performing

434
00:16:04,150 --> 00:16:01,360
the eva are once again iss commander

435
00:16:06,150 --> 00:16:04,160
suni williams and aki hoshide so we can

436
00:16:08,389 --> 00:16:06,160
go to the first graphic there we go so

437
00:16:10,069 --> 00:16:08,399
suni williams comes to us as our lead

438
00:16:13,189 --> 00:16:10,079

space walker and she's also currently

439
00:16:15,990 --> 00:16:13,199
the top female space walker she has just

440
00:16:18,470 --> 00:16:16,000
over 44 hours of eva time that she has

441
00:16:19,990 --> 00:16:18,480
earned over six evas and as mike

442
00:16:22,230 --> 00:16:20,000
mentioned two of those evas were

443
00:16:24,790 --> 00:16:22,240
actually spent out on the p6 truss so

444
00:16:26,150 --> 00:16:24,800
she's very familiar with this work site

445
00:16:29,509 --> 00:16:26,160
she will be wearing the suit with the

446
00:16:32,069 --> 00:16:29,519
red stripes and this will be her 7th eva

447
00:16:34,389 --> 00:16:32,079
ev2 will be aki hoshide he's the top

448
00:16:37,110 --> 00:16:34,399
jaxa spacewalker right now he has a

449
00:16:40,069 --> 00:16:37,120
total of 14 hours and 45 minutes of eva

450
00:16:41,910 --> 00:16:40,079
time that he earned in two evas just a

451
00:16:43,670 --> 00:16:41,920
little while ago that he performed with

452
00:16:45,670 --> 00:16:43,680
with sunny at the end of august in the

453
00:16:46,949 --> 00:16:45,680
beginning of september

454
00:16:48,949 --> 00:16:46,959
he will be wearing this suit with the

455
00:16:52,069 --> 00:16:48,959
white stripes and this will be his third

456
00:16:55,269 --> 00:16:52,079
eva the newly arrived flight engineer

457
00:16:57,110 --> 00:16:55,279
kevin ford will be our ivy assistant he

458
00:16:59,670 --> 00:16:57,120
will help the crew with their prep

459
00:17:01,509 --> 00:16:59,680
activities which includes the in-suit

460
00:17:03,110 --> 00:17:01,519
light exercise or aisle pre-booth

461
00:17:05,350 --> 00:17:03,120
protocol that the two crew members will

462
00:17:06,710 --> 00:17:05,360
be using for this spacewalk this is the

463
00:17:09,029 --> 00:17:06,720

same pre-breathed protocol that they

464
00:17:11,110 --> 00:17:09,039
used on both evas 18 and 19 so they are

465
00:17:12,870 --> 00:17:11,120
very familiar with it once the

466
00:17:14,710 --> 00:17:12,880
pre-breathe is complete kevin will

467
00:17:16,069 --> 00:17:14,720
assist in getting the crew members into

468
00:17:18,390 --> 00:17:16,079
the equipment lock he'll shut up the

469
00:17:20,069 --> 00:17:18,400
hatch and then assist in the depress of

470
00:17:21,429 --> 00:17:20,079
that crew lock and then once the d press

471
00:17:24,309 --> 00:17:21,439
is complete and the crew is ready to

472
00:17:26,710 --> 00:17:24,319
head outside kevin will hand the control

473
00:17:28,549 --> 00:17:26,720
over to mike fink as as other mike

474
00:17:30,150 --> 00:17:28,559
mentioned hand over to mike fink who

475
00:17:31,830 --> 00:17:30,160
will be the ground iv and then he will

476
00:17:33,830 --> 00:17:31,840
take the crew through their their

477
00:17:36,150 --> 00:17:33,840
planned timeline activities and then

478
00:17:37,750 --> 00:17:36,160
once the eva is complete mike will hand

479
00:17:39,270 --> 00:17:37,760
back over to kevin inside the vehicle

480
00:17:41,510 --> 00:17:39,280
and kevin will help get the crew inside

481
00:17:43,510 --> 00:17:41,520
the airlock repress the airlock and then

482
00:17:44,710 --> 00:17:43,520
assist in any ammonia decontamination

483
00:17:47,350 --> 00:17:44,720
procedure should the crew get

484
00:17:48,870 --> 00:17:47,360
contaminated during this procedure

485
00:17:53,270 --> 00:17:48,880
so we can go ahead and talk through the

486
00:17:55,029 --> 00:17:53,280
the overview tasks of this eva

487
00:17:56,710 --> 00:17:55,039
so you could as you know big picture as

488
00:17:58,710 --> 00:17:56,720

everyone mentioned the idea here is to

489
00:18:00,310 --> 00:17:58,720
isolate the 2b loop that's currently

490
00:18:02,549 --> 00:18:00,320
flowing through the photovoltaic

491
00:18:05,669 --> 00:18:02,559
radiator or pvr so we go about doing

492
00:18:07,350 --> 00:18:05,679
that by driving the fqdc or the fluid

493
00:18:09,909 --> 00:18:07,360
quick disconnect coupling so we'll

494
00:18:11,909 --> 00:18:09,919
demate that and then while that's going

495
00:18:13,830 --> 00:18:11,919
on we'll also be taking some pictures of

496
00:18:15,350 --> 00:18:13,840
the currently deployed radiator as well

497
00:18:17,110 --> 00:18:15,360
as the integrated equipment assembly

498
00:18:19,510 --> 00:18:17,120
adjacent to it to see if we can see any

499
00:18:21,029 --> 00:18:19,520
other signs of a possible mmod strike

500
00:18:23,350 --> 00:18:21,039
that could be that could account for

501
00:18:25,750 --> 00:18:23,360
this leak we will then perform the early

502
00:18:27,669 --> 00:18:25,760
ammonia servicer eas jumper

503
00:18:29,990 --> 00:18:27,679
reconfiguration and then the two crew

504
00:18:31,669 --> 00:18:30,000
members will work together to deploy

505
00:18:33,990 --> 00:18:31,679
that radiator which is the trailing

506
00:18:35,909 --> 00:18:34,000
thermal control or ticker radiator as

507
00:18:37,750 --> 00:18:35,919
you'll hear me describe it in just a

508
00:18:39,510 --> 00:18:37,760
little bit there's a shroud currently

509
00:18:41,190 --> 00:18:39,520
covering that so we'll stow the shroud

510
00:18:43,350 --> 00:18:41,200
and the two crew will work together to

511
00:18:45,029 --> 00:18:43,360
uh to deploy that radiator we'll also

512
00:18:47,190 --> 00:18:45,039
have the crew remain at the work site to

513
00:18:48,630 --> 00:18:47,200

assist in a manual eva deploy of that

514
00:18:52,390 --> 00:18:48,640
radiator if the

515
00:18:53,590 --> 00:18:52,400
if the ground commands are unsuccessful

516
00:18:57,669 --> 00:18:53,600
so we can go ahead and start the first

517
00:19:02,390 --> 00:18:59,669
okay so that crew members will egress

518
00:19:03,990 --> 00:19:02,400
the isis joint airlock aki will remain

519
00:19:06,789 --> 00:19:04,000
at the airlock while sunny will start

520
00:19:08,630 --> 00:19:06,799
making her way port on the iss truss she

521
00:19:10,870 --> 00:19:08,640
will make a pit stop at the midpoint of

522
00:19:13,029 --> 00:19:10,880
p1 where she will establish the two crew

523
00:19:14,789 --> 00:19:13,039
members safety tether anchor hooks the

524
00:19:16,789 --> 00:19:14,799
crew will be using safety tether packs

525
00:19:18,789 --> 00:19:16,799
which consists of two 85-foot tethers

526
00:19:21,029 --> 00:19:18,799
gang together once aki's tether is

527
00:19:23,029 --> 00:19:21,039
secure he'll translate aft to the z1

528
00:19:24,870 --> 00:19:23,039
starboard toolbox to retrieve a 12-inch

529
00:19:27,190 --> 00:19:24,880
socket extension that will need for to

530
00:19:28,470 --> 00:19:27,200
eva's activities once sonny has

531
00:19:30,789 --> 00:19:28,480
established her anchor point she'll

532
00:19:33,430 --> 00:19:30,799
continue to head outward along face one

533
00:19:35,510 --> 00:19:33,440
to p3 and then she'll make her way aft

534
00:19:37,750 --> 00:19:35,520
and zenith around the sarge and then

535
00:19:40,630 --> 00:19:37,760
she'll translate along the zenith aft

536
00:19:42,950 --> 00:19:40,640
edge of p4 out to p5 and to the midpoint

537
00:19:44,470 --> 00:19:42,960
of p6 and she'll take the valley between

538
00:19:46,150 --> 00:19:44,480

the ticker and the sticker which is the

539
00:19:47,510 --> 00:19:46,160
starboard radiator

540
00:19:49,510 --> 00:19:47,520
once she's out at the work site she'll

541
00:19:51,110 --> 00:19:49,520
then make her way to the iss forward

542
00:19:53,510 --> 00:19:51,120
face of p6

543
00:19:55,590 --> 00:19:53,520
and there she will set up camp and she

544
00:19:57,750 --> 00:19:55,600
will start work initially on the eas

545
00:19:59,590 --> 00:19:57,760
jumper reconfig she'll continue working

546
00:20:01,750 --> 00:19:59,600
on that until aki has retrieved the

547
00:20:03,510 --> 00:20:01,760
socket and followed the same translation

548
00:20:05,350 --> 00:20:03,520
path out to sunny

549
00:20:07,350 --> 00:20:05,360
once aki's out there he'll install the

550
00:20:08,950 --> 00:20:07,360
socket on the pgt or the pistol grip

551
00:20:11,270 --> 00:20:08,960
tool and the two crew members will work

552
00:20:13,110 --> 00:20:11,280
together to release the four fasteners

553
00:20:15,830 --> 00:20:13,120
that are currently holding the shroud

554
00:20:17,350 --> 00:20:15,840
that's flashing the cover in place

555
00:20:19,110 --> 00:20:17,360
that's currently protecting the fluid

556
00:20:21,830 --> 00:20:19,120
quick disconnect coupling

557
00:20:22,549 --> 00:20:21,840
once the cover is out of the way

558
00:20:31,909 --> 00:20:22,559
that

559
00:20:34,470 --> 00:20:31,919
we can see a flight photo of the fqdc

560
00:20:35,830 --> 00:20:34,480
itself so as as mike's have mentioned

561
00:20:37,830 --> 00:20:35,840
there are actually two loops that are

562
00:20:39,909 --> 00:20:37,840
currently running through this radiator

563
00:20:41,590 --> 00:20:39,919

the 2b side is on the left and the 4b

564
00:20:43,029 --> 00:20:41,600
side is on the right so sunny knows

565
00:20:44,630 --> 00:20:43,039
drive the one on the left don't touch

566
00:20:46,870 --> 00:20:44,640
the one on the right

567
00:20:48,870 --> 00:20:46,880
so she's going to use a pgt with a 12

568
00:20:50,870 --> 00:20:48,880
inch socket extension to drive that and

569
00:20:52,310 --> 00:20:50,880
we do have some nbl footage of that task

570
00:20:54,230 --> 00:20:52,320
being accomplished

571
00:20:56,630 --> 00:20:54,240
so once she gets in position aki will

572
00:20:58,310 --> 00:20:56,640
hand her the pgt and she'll get to work

573
00:21:00,070 --> 00:20:58,320
as i mentioned it's a 12 inch socket on

574
00:21:02,470 --> 00:21:00,080
this bolt and we're only driving this

575
00:21:04,230 --> 00:21:02,480
bolt seven turns and what that action is

576
00:21:07,510 --> 00:21:04,240
doing is it's physically separating the

577
00:21:09,510 --> 00:21:07,520
active and passive halves of this ffqdc

578
00:21:12,149 --> 00:21:09,520
and it's closing the valves for both the

579
00:21:15,110 --> 00:21:12,159
supply and return ammonia flow path to

580
00:21:16,230 --> 00:21:15,120
this the 2b side of this radiator

581
00:21:19,110 --> 00:21:16,240
and this is the first time we have

582
00:21:20,470 --> 00:21:19,120
actuated one of these fqdcs on orbit

583
00:21:21,909 --> 00:21:20,480
once they're complete with the seven

584
00:21:24,789 --> 00:21:21,919
turns they will work together to

585
00:21:26,149 --> 00:21:24,799
reinstall the shroud and cover and those

586
00:21:28,149 --> 00:21:26,159
four fasteners that are holding it in

587
00:21:30,390 --> 00:21:28,159
place and then sunny will get to work

588
00:21:34,070 --> 00:21:30,400

completing the rest of the eas jumper

589
00:21:37,590 --> 00:21:35,350
so you've seen this graphic before so

590
00:21:40,470 --> 00:21:37,600
the left side left side shows what the

591
00:21:42,310 --> 00:21:40,480
current configuration is the red fh02

592
00:21:44,710 --> 00:21:42,320
hose is the one that we actually used on

593
00:21:46,230 --> 00:21:44,720
the ulf6 refill approximately a year and

594
00:21:47,909 --> 00:21:46,240
a half ago

595
00:21:49,909 --> 00:21:47,919
it had ammonia in it and we've since

596
00:21:52,710 --> 00:21:49,919
vented it and it's wire tied off on one

597
00:21:54,390 --> 00:21:52,720
end to the fh01 hose that fh01 hose

598
00:21:55,830 --> 00:21:54,400
currently has a nitrogen pad and the

599
00:21:57,990 --> 00:21:55,840
last time it has been touched was

600
00:22:00,310 --> 00:21:58,000
actually by suni williams and mike lopez

601
00:22:01,909 --> 00:22:00,320
alegria during those expedition 14 evas

602
00:22:03,750 --> 00:22:01,919
when they installed this jumper in its

603
00:22:08,310 --> 00:22:03,760
current location so we have some

604
00:22:10,149 --> 00:22:08,320
additional nbl footage showing this task

605
00:22:11,909 --> 00:22:10,159
so you can see part of the reconfig is

606
00:22:13,270 --> 00:22:11,919
already complete so sonny's reconfigured

607
00:22:14,950 --> 00:22:13,280
the jumpers in the lower part of the

608
00:22:16,789 --> 00:22:14,960
screen while she was waiting for aki to

609
00:22:19,270 --> 00:22:16,799
arrive with a 12-inch socket and then

610
00:22:21,669 --> 00:22:19,280
her next task is to demate the fh01

611
00:22:23,909 --> 00:22:21,679
jumper from the m9 male so she can vent

612
00:22:25,990 --> 00:22:23,919
that nitrogen pad from the jumper once

613
00:22:29,110 --> 00:22:26,000

she gets the jumper de-mated she'll work

614
00:22:30,950 --> 00:22:29,120
on mating it to the nitrogen vent tool

615
00:22:33,110 --> 00:22:30,960
once the vent tool is mated she opens

616
00:22:34,230 --> 00:22:33,120
the female quick disconnect on that

617
00:22:35,909 --> 00:22:34,240
jumper and then she'll vent that

618
00:22:37,990 --> 00:22:35,919
nitrogen and that vent should only take

619
00:22:39,830 --> 00:22:38,000
just a few seconds

620
00:22:41,909 --> 00:22:39,840
once she's complete with the vent she'll

621
00:22:43,830 --> 00:22:41,919
demate the nitrogen tool from that

622
00:22:46,950 --> 00:22:43,840
jumper stow it away and then install

623
00:22:48,549 --> 00:22:46,960
that fh01 jumper on the m10 male

624
00:22:51,510 --> 00:22:48,559
and then she'll work to uh to

625
00:22:52,950 --> 00:22:51,520
reconfigure the fh02 jumper onto the m9

626
00:22:54,549 --> 00:22:52,960
male

627
00:22:56,470 --> 00:22:54,559
so then we'll end up with the post dvi

628
00:22:59,190 --> 00:22:56,480
configuration shown on the right where

629
00:23:01,190 --> 00:22:59,200
the fh the red fh02 jumper is what's

630
00:23:03,990 --> 00:23:01,200
supplying your chilled ammonia from the

631
00:23:06,870 --> 00:23:04,000
new radiator or the old newly deployed

632
00:23:08,950 --> 00:23:06,880
radiator into the 2b pvtcs system and

633
00:23:10,870 --> 00:23:08,960
then the blue jumper fh01 is supplying

634
00:23:12,870 --> 00:23:10,880
your ammonia that's been warmed by the

635
00:23:14,630 --> 00:23:12,880
batteries and the other equipment out on

636
00:23:18,070 --> 00:23:14,640
the iea back to your radiator for

637
00:23:22,149 --> 00:23:19,830
so once she's complete with the eas

638
00:23:24,870 --> 00:23:22,159

jumper reconfig she'll go over to help

639
00:23:26,710 --> 00:23:24,880
aki so meanwhile aki has been taking the

640
00:23:28,789 --> 00:23:26,720
photos i mentioned of the radiator as

641
00:23:30,549 --> 00:23:28,799
well as the iea and he's also been

642
00:23:32,870 --> 00:23:30,559
working on stowing a shroud that's

643
00:23:34,549 --> 00:23:32,880
currently covering the ticker radiator

644
00:23:36,710 --> 00:23:34,559
this shroud is a thin beta cloth

645
00:23:38,390 --> 00:23:36,720
material it's permanently attached on

646
00:23:40,710 --> 00:23:38,400
the inboard or left side of this image

647
00:23:43,110 --> 00:23:40,720
and then it's it's attached by two hooks

648
00:23:45,110 --> 00:23:43,120
on the outboard side it was installed by

649
00:23:46,230 --> 00:23:45,120
sliding along two guide straps that run

650
00:23:48,710 --> 00:23:46,240
on the top and the bottom of the

651
00:23:50,310 --> 00:23:48,720
radiator so aki will work to release one

652
00:23:52,310 --> 00:23:50,320
of the integrated hooks and he'll slide

653
00:23:53,909 --> 00:23:52,320
it as far inboard as he can

654
00:23:55,350 --> 00:23:53,919
uh he'll secure that and then he'll

655
00:23:56,870 --> 00:23:55,360
translate to the other side of the

656
00:23:58,789 --> 00:23:56,880
radiator or the top side of the radio in

657
00:24:00,390 --> 00:23:58,799
this image and he'll work to shimmy that

658
00:24:02,149 --> 00:24:00,400
down as far as he can until he reaches

659
00:24:03,750 --> 00:24:02,159
and reaches uh some interference then

660
00:24:05,269 --> 00:24:03,760
he'll make us he'll just continue going

661
00:24:08,149 --> 00:24:05,279
back and forth around the radiator until

662
00:24:10,710 --> 00:24:08,159
he gets the shroud all the way inboard

663
00:24:13,269 --> 00:24:10,720

once he gets it inboard

664
00:24:15,029 --> 00:24:13,279
he will secure it with wire ties to hold

665
00:24:16,470 --> 00:24:15,039
it in place and it it's around this time

666
00:24:18,470 --> 00:24:16,480
that sonny should be complete with her

667
00:24:21,029 --> 00:24:18,480
eas jumper work so she'll make her way

668
00:24:23,110 --> 00:24:21,039
to the aft side of p6 to help aki with

669
00:24:24,710 --> 00:24:23,120
that shroud stow and then the two crew

670
00:24:26,310 --> 00:24:24,720
members will work together to release

671
00:24:28,149 --> 00:24:26,320
the six cinches which you can see

672
00:24:30,149 --> 00:24:28,159
flashing this image that are currently

673
00:24:32,390 --> 00:24:30,159
holding the radio radiator in its stowed

674
00:24:34,070 --> 00:24:32,400
config they'll first release the inboard

675
00:24:35,430 --> 00:24:34,080
and outboard cinches and stow those in

676
00:24:37,430 --> 00:24:35,440
their stowage clips and then they'll

677
00:24:38,310 --> 00:24:37,440
release the four side cinches and stow

678
00:24:39,669 --> 00:24:38,320
those

679
00:24:41,750 --> 00:24:39,679
once they're complete with the cinch

680
00:24:43,350 --> 00:24:41,760
release they'll release the two final

681
00:24:46,070 --> 00:24:43,360
winch pit pins which are holding the

682
00:24:47,909 --> 00:24:46,080
radiator in its stowed position once

683
00:24:49,750 --> 00:24:47,919
they release release those winch pit

684
00:24:51,510 --> 00:24:49,760
pins aki will make his way inboard and

685
00:24:53,590 --> 00:24:51,520
sunny will make her way to the outboard

686
00:24:55,750 --> 00:24:53,600
edge of the radiator she'll verify that

687
00:24:57,510 --> 00:24:55,760
all tools tethers and ev crew members

688
00:24:58,870 --> 00:24:57,520

are clear of the radiator deployment

689
00:25:00,630 --> 00:24:58,880
envelope and then she'll give the ground

690
00:25:02,149 --> 00:25:00,640
the go to issue the command to deploy

691
00:25:05,510 --> 00:25:02,159
the radiator

692
00:25:07,830 --> 00:25:05,520
deploying grab her camera and take a few

693
00:25:10,149 --> 00:25:07,840
pictures of that deployment

694
00:25:11,590 --> 00:25:10,159
and like as i mentioned the manual drive

695
00:25:13,430 --> 00:25:11,600
bolt is located right there near her

696
00:25:15,510 --> 00:25:13,440
work site so in the event that the

697
00:25:16,950 --> 00:25:15,520
ground deploy isn't successful she can

698
00:25:19,190 --> 00:25:16,960
help out with her pistol grip tool to

699
00:25:20,630 --> 00:25:19,200
manually deploy that radiator as she's

700
00:25:22,710 --> 00:25:20,640
cleaning up her work side and taking a

701
00:25:24,310 --> 00:25:22,720
few more photographs aki is translating

702
00:25:26,549 --> 00:25:24,320
back to the airlock along the same

703
00:25:28,310 --> 00:25:26,559
translation path that he took out board

704
00:25:30,310 --> 00:25:28,320
once he's at the airlock he'll establish

705
00:25:32,470 --> 00:25:30,320
a waist tether as the new safety as the

706
00:25:34,390 --> 00:25:32,480
new safety tether for the pair sunny

707
00:25:37,029 --> 00:25:34,400
will start making her way inboard she'll

708
00:25:38,870 --> 00:25:37,039
make a stop at the midpoint of p1 where

709
00:25:40,630 --> 00:25:38,880
she had anchored their safety tethers

710
00:25:42,549 --> 00:25:40,640
she'll pick those tethers up make her

711
00:25:44,390 --> 00:25:42,559
way back to the airlock as well and then

712
00:25:46,789 --> 00:25:44,400
they'll close the hatch on a successful

713
00:25:48,230 --> 00:25:46,799

six and a half hour eva and the last

714
00:25:50,710 --> 00:25:48,240
image i'd like to leave you with is what

715
00:25:52,789 --> 00:25:50,720
i'm calling sonny's deja vu as mike

716
00:25:54,549 --> 00:25:52,799
mentioned this was this sunny you know

717
00:25:56,549 --> 00:25:54,559
stowed this radiator during expedition

718
00:25:58,870 --> 00:25:56,559
14 and now she's going to be redeploying

719
00:26:00,470 --> 00:25:58,880
it so hopefully she will enjoy seeing

720
00:26:03,350 --> 00:26:00,480
this image once again with the exception

721
00:26:04,950 --> 00:26:03,360
of the russian segment behind p6

722
00:26:06,870 --> 00:26:04,960
but with that that's all i have and i'll

723
00:26:08,230 --> 00:26:06,880
hand it back to josh okay let's take

724
00:26:09,510 --> 00:26:08,240
some questions here in houston first and

725
00:26:10,710 --> 00:26:09,520
we'll go to the phone lines let's start

726
00:26:12,950 --> 00:26:10,720
with gina

727
00:26:14,789 --> 00:26:12,960
um i don't know who wants to take this

728
00:26:16,789 --> 00:26:14,799
but this is sort of like a detective

729
00:26:18,710 --> 00:26:16,799
trip going out there first to see if you

730
00:26:20,950 --> 00:26:18,720
can figure out they can figure out

731
00:26:22,950 --> 00:26:20,960
where the leak is coming from and then

732
00:26:25,510 --> 00:26:22,960
you'll proceed from there

733
00:26:26,789 --> 00:26:25,520
yes that's correct what we'll do is um

734
00:26:27,750 --> 00:26:26,799
because we don't know exactly where the

735
00:26:30,470 --> 00:26:27,760
leak is

736
00:26:32,230 --> 00:26:30,480
um this this supports us an opportunity

737
00:26:33,269 --> 00:26:32,240
to regain the loop

738
00:26:37,110 --> 00:26:33,279

um

739
00:26:39,830 --> 00:26:37,120
while we check to see if we've if we've

740
00:26:41,269 --> 00:26:39,840
taken care of the leak or not and so

741
00:26:43,990 --> 00:26:41,279
what this will tell us is whether the

742
00:26:46,950 --> 00:26:44,000
radiator is the cause of the leak

743
00:26:49,269 --> 00:26:46,960
if if it turns out the leak continues

744
00:26:51,190 --> 00:26:49,279
uh well we we have a little time because

745
00:26:53,350 --> 00:26:51,200
the the loop will continue to operate

746
00:26:56,710 --> 00:26:53,360
but as mike said

747
00:26:59,110 --> 00:26:56,720
when we filled this system a year ago

748
00:27:01,190 --> 00:26:59,120
the result of that fill was also fill up

749
00:27:03,190 --> 00:27:01,200
the early ammonia system as well and so

750
00:27:05,190 --> 00:27:03,200
we have extra ammonia in that loop so it

751
00:27:08,070 --> 00:27:05,200
buys us a little time it helps us

752
00:27:09,830 --> 00:27:08,080
isolate the pvr lets us isolate the pvr

753
00:27:11,350 --> 00:27:09,840
to see if that's the cause

754
00:27:13,430 --> 00:27:11,360
if that turns out not to be the cause

755
00:27:15,990 --> 00:27:13,440
then we have to think about the next

756
00:27:17,990 --> 00:27:16,000
steps and and there was one

757
00:27:19,350 --> 00:27:18,000
one point we contemplating going outside

758
00:27:20,870 --> 00:27:19,360
you can isolate

759
00:27:22,549 --> 00:27:20,880
all of those you could isolate the pump

760
00:27:24,149 --> 00:27:22,559
the pbr and the lines you have to keep

761
00:27:27,029 --> 00:27:24,159
the system shut down but again it takes

762
00:27:28,950 --> 00:27:27,039
you several weeks to figure out where

763
00:27:30,789 --> 00:27:28,960

what's leaking and and if it's leaking

764
00:27:32,470 --> 00:27:30,799
so the next step after this if we're

765
00:27:33,750 --> 00:27:32,480
still leaking like i said but we've

766
00:27:36,149 --> 00:27:33,760
bought ourselves some time we'll go

767
00:27:38,310 --> 00:27:36,159
think about uh what we want to do next

768
00:27:39,909 --> 00:27:38,320
whether we want to try to isolate

769
00:27:41,909 --> 00:27:39,919
the other two systems and just have the

770
00:27:44,630 --> 00:27:41,919
system shut down for a while whether we

771
00:27:46,310 --> 00:27:44,640
want to just go and proactively r r the

772
00:27:48,310 --> 00:27:46,320
pump and see if that fixes a problem so

773
00:27:49,110 --> 00:27:48,320
we we have some forward work to do after

774
00:27:52,549 --> 00:27:49,120
this

775
00:27:53,590 --> 00:27:52,559
um as mike said and and uh many of us

776
00:27:55,750 --> 00:27:53,600
believe

777
00:27:57,190 --> 00:27:55,760
um if you look at pictures of the iss

778
00:28:02,470 --> 00:27:57,200
you'll find

779
00:28:04,389 --> 00:28:02,480
of them in two or three locations so

780
00:28:06,549 --> 00:28:04,399
it's entirely possible that the leak

781
00:28:09,269 --> 00:28:06,559
source is a is a hit to this particular

782
00:28:10,870 --> 00:28:09,279
pbr so this gives us at least that it'll

783
00:28:12,710 --> 00:28:10,880
tell us if that's the cause or not and

784
00:28:15,510 --> 00:28:12,720
then we can decide later

785
00:28:17,990 --> 00:28:15,520
if it's not that what we do next

786
00:28:19,669 --> 00:28:18,000
if it is a micro meteorite hit i mean

787
00:28:21,190 --> 00:28:19,679
some of those are so small you really

788
00:28:23,510 --> 00:28:21,200

can't do much

789
00:28:25,269 --> 00:28:23,520
to anticipate those what do you do to

790
00:28:27,510 --> 00:28:25,279
defend yourself against

791
00:28:29,669 --> 00:28:27,520
something that's that tiny ahead or how

792
00:28:30,470 --> 00:28:29,679
tiny a hit would have to be to cause a

793
00:28:34,950 --> 00:28:30,480
leak

794
00:28:37,190 --> 00:28:34,960
the actual

795
00:28:39,110 --> 00:28:37,200
point at where you're leaking is

796
00:28:41,269 --> 00:28:39,120
probably around the width of your hair

797
00:28:42,870 --> 00:28:41,279
perhaps even smaller than that so it's a

798
00:28:45,830 --> 00:28:42,880
very very tiny

799
00:28:47,909 --> 00:28:45,840
leak we may not even see it if it's a if

800
00:28:49,990 --> 00:28:47,919
it's a if it's a direct hit and that's

801
00:28:52,070 --> 00:28:50,000
as small as the hole is you we won't see

802
00:28:53,909 --> 00:28:52,080
it if it's a glancing blow

803
00:28:55,990 --> 00:28:53,919
and we're at the deepest point you

804
00:28:57,909 --> 00:28:56,000
manage to to

805
00:28:59,430 --> 00:28:57,919
you know cut into the line then maybe

806
00:29:02,710 --> 00:28:59,440
you'll see it because you have the the

807
00:29:04,389 --> 00:29:02,720
glancing blow and the design of iss was

808
00:29:06,149 --> 00:29:04,399
was built to withstand these kinds of

809
00:29:07,830 --> 00:29:06,159
hits and in these systems it was the

810
00:29:09,669 --> 00:29:07,840
redundancy of the systems that gave us

811
00:29:11,750 --> 00:29:09,679
that capability and so

812
00:29:13,750 --> 00:29:11,760
uh if it turns out to be an mmo

813
00:29:16,149 --> 00:29:13,760

mmod hit this is exactly the way the

814
00:29:18,549 --> 00:29:16,159
design was was meant to deal with it and

815
00:29:20,230 --> 00:29:18,559
we we could live without this power

816
00:29:21,430 --> 00:29:20,240
system for the time it would take us to

817
00:29:23,590 --> 00:29:21,440
go outside

818
00:29:25,750 --> 00:29:23,600
and change out a pump or uh

819
00:29:27,430 --> 00:29:25,760
or or a radiator or whatever so that

820
00:29:30,070 --> 00:29:27,440
that's that you know the rest of the the

821
00:29:32,950 --> 00:29:30,080
pressurized modules have uh shielding

822
00:29:35,190 --> 00:29:32,960
around them for the smaller mmod and and

823
00:29:38,149 --> 00:29:35,200
then for the larger of course we we

824
00:29:40,470 --> 00:29:38,159
protect ourselves with the help of the

825
00:29:44,149 --> 00:29:40,480
the stratcom folks who let us know when

826
00:29:48,230 --> 00:29:45,269
robert

827
00:29:50,870 --> 00:29:48,240
again

828
00:29:53,830 --> 00:29:50,880
for who wants to take it if you if you

829
00:29:55,909 --> 00:29:53,840
by chance do see the mmod strike if

830
00:29:57,510 --> 00:29:55,919
sonny gets out there and the sun's at

831
00:29:58,950 --> 00:29:57,520
the right angle and you happen to see it

832
00:30:00,789 --> 00:29:58,960
does that change anything with the

833
00:30:02,470 --> 00:30:00,799
spacewalk in terms of activities that

834
00:30:05,590 --> 00:30:02,480
you would do

835
00:30:07,830 --> 00:30:05,600
and is if it is an mmod hit would you

836
00:30:09,430 --> 00:30:07,840
consider bringing the radiator back on a

837
00:30:11,909 --> 00:30:09,440
future spacex

838
00:30:14,389 --> 00:30:11,919

dragon to study or and do you have an

839
00:30:16,389 --> 00:30:14,399
extra radiator out there to replace it

840
00:30:17,830 --> 00:30:16,399
let's see a we have an extra radiator

841
00:30:20,149 --> 00:30:17,840
the one we're using

842
00:30:21,830 --> 00:30:20,159
the we have two spare pbrs they're the

843
00:30:24,310 --> 00:30:21,840
one the one we're deploying to use and

844
00:30:26,710 --> 00:30:24,320
the other one

845
00:30:29,110 --> 00:30:26,720
that allison referred to as the sticker

846
00:30:30,630 --> 00:30:29,120
so those are our spare pvr radiators we

847
00:30:32,870 --> 00:30:30,640
have one spare

848
00:30:35,510 --> 00:30:32,880
central system radiator also that sits

849
00:30:37,430 --> 00:30:35,520
on one of the external pallets outside

850
00:30:38,870 --> 00:30:37,440
uh if we saw what we thought was the

851
00:30:40,630 --> 00:30:38,880
hole it wouldn't stop what we do and

852
00:30:42,389 --> 00:30:40,640
because we're going into a configuration

853
00:30:43,269 --> 00:30:42,399
that we can operate from indefinitely

854
00:30:45,430 --> 00:30:43,279
and so

855
00:30:47,590 --> 00:30:45,440
uh we'd go wow that's interesting and

856
00:30:49,029 --> 00:30:47,600
and g-whiz and we would assume that this

857
00:30:50,789 --> 00:30:49,039
is going to solve our leak problem we

858
00:30:53,110 --> 00:30:50,799
would config continue with the

859
00:30:54,950 --> 00:30:53,120
configuration and as i said we could

860
00:30:56,389 --> 00:30:54,960
stay like this indefinitely so we would

861
00:30:58,710 --> 00:30:56,399
that's probably what we do and then we'd

862
00:31:00,149 --> 00:30:58,720
have the conversation about do we want

863
00:31:01,669 --> 00:31:00,159

to go to all the trouble to move a

864
00:31:03,750 --> 00:31:01,679
radiator because that's not a simple

865
00:31:07,590 --> 00:31:03,760
process and i don't have a capability

866
00:31:11,029 --> 00:31:08,870
all right

867
00:31:13,190 --> 00:31:11,039
thanks so mark caro for aviation week i

868
00:31:16,710 --> 00:31:13,200
have a couple of questions um does

869
00:31:21,830 --> 00:31:16,720
anybody know that the dimension of the

870
00:31:24,789 --> 00:31:22,789
uh

871
00:31:26,310 --> 00:31:24,799
i don't know what exactly we can get you

872
00:31:28,389 --> 00:31:26,320
that number how long does it take to

873
00:31:30,470 --> 00:31:28,399
deploy

874
00:31:32,549 --> 00:31:30,480
the pgt yeah i remember it took it's

875
00:31:34,389 --> 00:31:32,559
about one second a foot at the pgt

876
00:31:36,310 --> 00:31:34,399
so i'd be just guessing i would say it's

877
00:31:39,590 --> 00:31:36,320
probably 30 or 40 feet yeah i think it's

878
00:31:40,950 --> 00:31:39,600
45 feet long about 17 feet or 15 feet

879
00:31:43,909 --> 00:31:40,960
wide i'm not sure what the other

880
00:31:47,430 --> 00:31:45,350
yeah um

881
00:31:49,430 --> 00:31:47,440
i just want to follow up on the on the

882
00:31:53,190 --> 00:31:49,440
spare question

883
00:31:54,870 --> 00:31:53,200
um and make sure i understood sorry uh

884
00:31:57,350 --> 00:31:54,880
you do have a

885
00:32:00,230 --> 00:31:57,360
an undeployed spare

886
00:32:02,470 --> 00:32:00,240
radiator is at the case that's was taken

887
00:32:04,470 --> 00:32:02,480
up during the last uh

888
00:32:06,389 --> 00:32:04,480

series of shuttle missions to give you

889
00:32:08,630 --> 00:32:06,399
spares that's the central system

890
00:32:10,870 --> 00:32:08,640
radiator they're much bigger than the

891
00:32:12,870 --> 00:32:10,880
than these pbrs so they're different

892
00:32:14,389 --> 00:32:12,880
radiators so we have one of those that's

893
00:32:16,389 --> 00:32:14,399
the one you're thinking of we flew it up

894
00:32:18,230 --> 00:32:16,399
on the second to the last flight i think

895
00:32:19,830 --> 00:32:18,240
and a pallet anyway one of the last

896
00:32:21,110 --> 00:32:19,840
flights that took the pallets up we i

897
00:32:23,110 --> 00:32:21,120
think it was the last flight in fact we

898
00:32:25,350 --> 00:32:23,120
took the pallet up had it on there

899
00:32:27,269 --> 00:32:25,360
um and then for the pvr system the

900
00:32:28,789 --> 00:32:27,279
spares the intended spares were the two

901
00:32:30,470 --> 00:32:28,799
early ammonia system

902
00:32:32,310 --> 00:32:30,480
radiators that one of which we're going

903
00:32:33,909 --> 00:32:32,320
to deploy

904
00:32:40,549 --> 00:32:33,919
if you

905
00:32:44,870 --> 00:32:40,559
the lead trend

906
00:32:47,430 --> 00:32:44,880
do you do you have some time

907
00:32:50,549 --> 00:32:47,440
um or are you kind of back in a

908
00:32:52,950 --> 00:32:50,559
contingency eva mode where you have to

909
00:32:55,990 --> 00:32:52,960
go out and do something

910
00:32:57,590 --> 00:32:56,000
before the end of december early

911
00:32:59,029 --> 00:32:57,600
january

912
00:33:00,310 --> 00:32:59,039
i guess i'm just trying to sort of

913
00:33:03,190 --> 00:33:00,320

figure out

914
00:33:05,190 --> 00:33:03,200
where you go if

915
00:33:07,430 --> 00:33:05,200
after you replace this it sounds like it

916
00:33:09,509 --> 00:33:07,440
may take a few weeks to determine

917
00:33:11,430 --> 00:33:09,519
whether you have a leak or not and then

918
00:33:12,950 --> 00:33:11,440
if you do you're sort of bumping up

919
00:33:15,350 --> 00:33:12,960
against

920
00:33:17,269 --> 00:33:15,360
the uh the deadline you

921
00:33:19,350 --> 00:33:17,279
spoke out sooner so that's just my

922
00:33:20,870 --> 00:33:19,360
question right and as we talked about so

923
00:33:22,630 --> 00:33:20,880
there's more ammonia now that's been

924
00:33:25,590 --> 00:33:22,640
brought to bear so we can go a little

925
00:33:27,350 --> 00:33:25,600
longer at the leak rate

926
00:33:30,870 --> 00:33:27,360
it's not completely clear to us the

927
00:33:32,389 --> 00:33:30,880
actual leak rate so it may be

928
00:33:33,669 --> 00:33:32,399
a little bit slower so we've probably

929
00:33:34,870 --> 00:33:33,679
bought ourselves just because we have

930
00:33:37,190 --> 00:33:34,880
the extra ammonia we probably bought

931
00:33:38,789 --> 00:33:37,200
ourselves a few months to work and think

932
00:33:40,470 --> 00:33:38,799
about it

933
00:33:41,350 --> 00:33:40,480
there you go trending

934
00:33:43,190 --> 00:33:41,360
and of course there's a lot of

935
00:33:45,350 --> 00:33:43,200
assumptions that go into that but but

936
00:33:47,190 --> 00:33:45,360
using the number that had them

937
00:33:48,470 --> 00:33:47,200
lasting until december or january i

938
00:33:50,070 --> 00:33:48,480

think they told me

939
00:33:51,990 --> 00:33:50,080
october

940
00:33:54,070 --> 00:33:52,000
and again lots of assumptions go into

941
00:33:56,710 --> 00:33:54,080
that number but it is better and i think

942
00:33:58,950 --> 00:33:56,720
that's the message

943
00:34:00,070 --> 00:33:58,960
okay is that it from here

944
00:34:01,750 --> 00:34:00,080
let's go to the phone lines we'll come

945
00:34:05,509 --> 00:34:01,760
back here uh let's see we have bill

946
00:34:09,510 --> 00:34:07,350
yeah a couple of real quick ones from me

947
00:34:11,030 --> 00:34:09,520
um i think you just answered um that my

948
00:34:12,149 --> 00:34:11,040
first question is which is how long you

949
00:34:14,149 --> 00:34:12,159
could last and mike i guess you're

950
00:34:15,510 --> 00:34:14,159
saying if nothing changed and it all

951
00:34:19,270 --> 00:34:15,520
stayed the same you've got till next

952
00:34:22,389 --> 00:34:20,790
which by the way you'll have to spend

953
00:34:23,669 --> 00:34:22,399
well there's a lot of mics involved with

954
00:34:25,109 --> 00:34:23,679
this eva

955
00:34:27,909 --> 00:34:25,119
so maybe you should call me mike and

956
00:34:28,790 --> 00:34:27,919
we'll we'll defer to mr suffordini here

957
00:34:30,629 --> 00:34:28,800
but

958
00:34:34,790 --> 00:34:30,639
i'll be sorry sorry about that sorry

959
00:34:36,710 --> 00:34:34,800
about that but uh um if if we if i think

960
00:34:40,950 --> 00:34:36,720
your question was if we did nothing how

961
00:34:44,869 --> 00:34:42,550
once we've reconfigured how long we

962
00:34:47,349 --> 00:34:44,879
could last um it's it's longer it

963
00:34:50,310 --> 00:34:47,359

depends on the assumptions that you use

964
00:34:52,869 --> 00:34:50,320
and we think it's until october

965
00:34:54,869 --> 00:34:52,879
okay thanks um and another quick one for

966
00:34:56,470 --> 00:34:54,879
me how does an mmod hit explain the

967
00:34:58,470 --> 00:34:56,480
change in the leak rate since you had a

968
00:35:00,069 --> 00:34:58,480
small leak rate at first and there was a

969
00:35:02,390 --> 00:35:00,079
change of some sort

970
00:35:05,510 --> 00:35:02,400
would that not imply two leaks that's

971
00:35:07,109 --> 00:35:05,520
what that would imply correct

972
00:35:10,150 --> 00:35:07,119
so we have the existing leak that we've

973
00:35:11,829 --> 00:35:10,160
been feeding um

974
00:35:14,150 --> 00:35:11,839
don't know exactly where it is might be

975
00:35:16,310 --> 00:35:14,160
the qd connection don't know but anyway

976
00:35:18,550 --> 00:35:16,320
we've been feeding it

977
00:35:20,870 --> 00:35:18,560
most of us don't believe that that leak

978
00:35:23,109 --> 00:35:20,880
has gotten worse

979
00:35:24,710 --> 00:35:23,119
so that was in the fall tree though is

980
00:35:27,190 --> 00:35:24,720
the possibility that whatever was

981
00:35:30,230 --> 00:35:27,200
causing that leak is has now grown for

982
00:35:31,910 --> 00:35:30,240
reasons that we couldn't exactly explain

983
00:35:34,310 --> 00:35:31,920
and so that is certainly one of the

984
00:35:35,270 --> 00:35:34,320
possible causes

985
00:35:37,270 --> 00:35:35,280
and

986
00:35:39,990 --> 00:35:37,280
but most of us kind of leaning towards

987
00:35:42,390 --> 00:35:40,000
the mmod impact just because it's a more

988
00:35:44,550 --> 00:35:42,400

likely scenario

989
00:35:46,390 --> 00:35:44,560
okay and finally for me um

990
00:35:47,829 --> 00:35:46,400
following up on mark caro's question the

991
00:35:49,430 --> 00:35:47,839
early ammonia

992
00:35:51,109 --> 00:35:49,440
coolant system two radiators you

993
00:35:54,069 --> 00:35:51,119
mentioned that are out on p6 can they be

994
00:35:56,829 --> 00:35:54,079
moved if if a pvr on some other you know

995
00:35:58,470 --> 00:35:56,839
module got damaged down the road

996
00:35:59,750 --> 00:35:58,480
yes

997
00:36:02,069 --> 00:35:59,760
thank you

998
00:36:04,390 --> 00:36:02,079
okay jim oberg with nbc

999
00:36:06,550 --> 00:36:04,400
yeah hi to this for for mr suffrani

1000
00:36:08,310 --> 00:36:06,560
hello and i've gotten all the technical

1001
00:36:10,790 --> 00:36:08,320
questions answered on the eba so thank

1002
00:36:12,630 --> 00:36:10,800
you uh is it my impression that this uh

1003
00:36:14,630 --> 00:36:12,640
last launch

1004
00:36:16,550 --> 00:36:14,640
last week was the first from the

1005
00:36:18,790 --> 00:36:16,560
first the u.s launch from the new pad or

1006
00:36:20,470 --> 00:36:18,800
the old pad rather and if it was uh what

1007
00:36:21,829 --> 00:36:20,480
it looked like how different was it than

1008
00:36:24,150 --> 00:36:21,839
watching it from

1009
00:36:25,910 --> 00:36:24,160
the gagarin pad

1010
00:36:28,150 --> 00:36:25,920
well jim i have to tell you i wasn't at

1011
00:36:30,310 --> 00:36:28,160
this particular launch i divide that

1012
00:36:32,069 --> 00:36:30,320
responsibility with my boss who was nice

1013
00:36:34,710 --> 00:36:32,079

enough to go this time so i wasn't there

1014
00:36:36,950 --> 00:36:34,720
to witness it um it was the first human

1015
00:36:39,270 --> 00:36:36,960
launch from that pad is my understanding

1016
00:36:41,589 --> 00:36:39,280
at least for many many years if it

1017
00:36:43,349 --> 00:36:41,599
hasn't been forever

1018
00:36:46,950 --> 00:36:43,359
and

1019
00:36:49,589 --> 00:36:46,960
colleagues is that you're much further

1020
00:36:53,109 --> 00:36:49,599
away than you are when you're at pad one

1021
00:36:56,950 --> 00:36:53,119
so it was a a a different view it's also

1022
00:36:59,030 --> 00:36:56,960
a much longer trip to get out to the pad

1023
00:37:00,550 --> 00:36:59,040
but you'd have to ask

1024
00:37:02,069 --> 00:37:00,560
next time you get gerst in front of the

1025
00:37:03,990 --> 00:37:02,079
camera you might ask him what he thought

1026
00:37:06,069 --> 00:37:04,000
of the of the view yeah we're getting

1027
00:37:07,750 --> 00:37:06,079
off camera no problem yeah it was a

1028
00:37:09,109 --> 00:37:07,760
couple about 40 years ago in the early

1029
00:37:10,710 --> 00:37:09,119
70s or

1030
00:37:11,910 --> 00:37:10,720
there were a couple sawyers man launches

1031
00:37:12,870 --> 00:37:11,920
but you're right it's been about 40

1032
00:37:15,109 --> 00:37:12,880
years

1033
00:37:16,870 --> 00:37:15,119
okay we'll take that real good and maybe

1034
00:37:20,390 --> 00:37:16,880
we'll both go to watch the next one i'll

1035
00:37:26,630 --> 00:37:20,400
be glad to do that with you okay

1036
00:37:30,470 --> 00:37:28,550
oh yeah hi guys thanks for for doing

1037
00:37:31,990 --> 00:37:30,480
this this is just just sort of a basic

1038
00:37:33,829 --> 00:37:32,000

question could you put into

1039
00:37:35,910 --> 00:37:33,839
just like a little perspective i mean is

1040
00:37:37,270 --> 00:37:35,920
this a more challenging space walk than

1041
00:37:38,710 --> 00:37:37,280
the average space man i know there's

1042
00:37:40,630 --> 00:37:38,720
there's no such thing as an average one

1043
00:37:42,550 --> 00:37:40,640
because just just kind of tell us

1044
00:37:45,349 --> 00:37:42,560
i mean is this one

1045
00:37:47,190 --> 00:37:45,359
get they're going to be put

1046
00:37:49,030 --> 00:37:47,200
yeah i know really challenging really

1047
00:37:50,870 --> 00:37:49,040
technically

1048
00:37:52,310 --> 00:37:50,880
difficult in like some ways that you

1049
00:37:53,910 --> 00:37:52,320
haven't experienced before i mean just

1050
00:37:56,310 --> 00:37:53,920
like little perspective on what's what

1051
00:37:57,750 --> 00:37:56,320
to expect with this one um

1052
00:38:00,069 --> 00:37:57,760
i'll let allison handle some of the

1053
00:38:02,150 --> 00:38:00,079
technical stuff but it's it's different

1054
00:38:03,750 --> 00:38:02,160
um some of the these recent spacewalks

1055
00:38:06,230 --> 00:38:03,760
that we've been doing of course are

1056
00:38:07,910 --> 00:38:06,240
outside of the shuttle era and it it's

1057
00:38:09,990 --> 00:38:07,920
been different just from a big picture

1058
00:38:11,430 --> 00:38:10,000
perspective in that uh you know this

1059
00:38:13,829 --> 00:38:11,440
crew didn't know that they were doing

1060
00:38:15,349 --> 00:38:13,839
that particular spacewalk when when they

1061
00:38:17,190 --> 00:38:15,359
launched in fact

1062
00:38:20,230 --> 00:38:17,200
didn't know until about three weeks ago

1063
00:38:22,470 --> 00:38:20,240

so it's it's interesting um from from

1064
00:38:23,589 --> 00:38:22,480
the point of view of getting of getting

1065
00:38:25,589 --> 00:38:23,599
the

1066
00:38:27,349 --> 00:38:25,599
sonny and aki ready on orbit and getting

1067
00:38:29,109 --> 00:38:27,359
them briefing packages and talking

1068
00:38:30,790 --> 00:38:29,119
through things and getting them trained

1069
00:38:32,790 --> 00:38:30,800
when they're when we don't have the

1070
00:38:34,390 --> 00:38:32,800
opportunity that we had with the shuttle

1071
00:38:36,069 --> 00:38:34,400
crews where we'd uh we'd all go out to

1072
00:38:37,349 --> 00:38:36,079
the nbl we we'd work through the

1073
00:38:39,349 --> 00:38:37,359
procedures

1074
00:38:41,910 --> 00:38:39,359
and and then you know sit around on the

1075
00:38:43,990 --> 00:38:41,920
table and talk about how things went we

1076
00:38:45,670 --> 00:38:44,000
have to uh we have to take a little bit

1077
00:38:47,190 --> 00:38:45,680
different approach uh when it comes to

1078
00:38:48,790 --> 00:38:47,200
just just getting ready overall and

1079
00:38:51,030 --> 00:38:48,800
getting these guys ready to go out the

1080
00:38:52,870 --> 00:38:51,040
door so that's it from the big

1081
00:38:55,510 --> 00:38:52,880
perspective and maybe allison's got a

1082
00:38:57,750 --> 00:38:55,520
few things on that on the technical end

1083
00:38:59,910 --> 00:38:57,760
i would say this is an average skill

1084
00:39:01,829 --> 00:38:59,920
level eva maybe slightly more

1085
00:39:03,510 --> 00:39:01,839
challenging than your average eva the

1086
00:39:05,270 --> 00:39:03,520
thing that we have going for us is that

1087
00:39:06,870 --> 00:39:05,280
sunny is very experienced with fluid

1088
00:39:08,390 --> 00:39:06,880

quick disconnects that would be the the

1089
00:39:10,150 --> 00:39:08,400
one task in my mind that's more

1090
00:39:11,990 --> 00:39:10,160
complicated is we do have quite a bit of

1091
00:39:14,790 --> 00:39:12,000
fluid quick disconnect manipulation

1092
00:39:17,349 --> 00:39:14,800
during this eva but since sunny has seen

1093
00:39:19,270 --> 00:39:17,359
these exact jumpers and qd's during

1094
00:39:21,589 --> 00:39:19,280
increment 14 and she also experienced

1095
00:39:23,670 --> 00:39:21,599
quite a bit of cutie action

1096
00:39:25,589 --> 00:39:23,680
during her z1 work during these same

1097
00:39:27,190 --> 00:39:25,599
evas i feel like she has a leg up on the

1098
00:39:28,390 --> 00:39:27,200
competition because she's she's done all

1099
00:39:29,510 --> 00:39:28,400
this stuff before

1100
00:39:31,109 --> 00:39:29,520
the other thing that's a little more

1101
00:39:32,630 --> 00:39:31,119
challenging is as i mentioned this is

1102
00:39:33,990 --> 00:39:32,640
the first time that we've operated one

1103
00:39:36,950 --> 00:39:34,000
of those fluid quick disconnect

1104
00:39:38,710 --> 00:39:36,960
couplings or the fqdc so that mechanism

1105
00:39:40,069 --> 00:39:38,720
does look sort of intimidating but we've

1106
00:39:42,069 --> 00:39:40,079
got an agreement that we only need to

1107
00:39:44,470 --> 00:39:42,079
turn it just just enough turns to close

1108
00:39:46,310 --> 00:39:44,480
the valves so that that shouldn't be

1109
00:39:48,230 --> 00:39:46,320
shouldn't be that bad and the rest of

1110
00:39:50,470 --> 00:39:48,240
the tasks the radiator deploy we've done

1111
00:39:51,990 --> 00:39:50,480
those quite a few times over the years

1112
00:39:53,990 --> 00:39:52,000
so we have a good experience base to

1113
00:39:57,589 --> 00:39:54,000

pull from so i feel like that task

1114
00:39:58,550 --> 00:39:57,599
shouldn't be too challenging either

1115
00:40:00,390 --> 00:39:58,560
thank you

1116
00:40:03,430 --> 00:40:00,400
okay thanks mike uh let's see do we have

1117
00:40:05,109 --> 00:40:03,440
an edward with jij press

1118
00:40:06,150 --> 00:40:05,119
yeah i i don't really have a question

1119
00:40:07,510 --> 00:40:06,160
this time though everything's been

1120
00:40:08,630 --> 00:40:07,520
answered so thank you thank you very

1121
00:40:11,190 --> 00:40:08,640
much let's come back here to houston see

1122
00:40:14,630 --> 00:40:11,200
if there's any follow-ups mark

1123
00:40:17,829 --> 00:40:14,640
mark for aviation week i have a dragon

1124
00:40:20,550 --> 00:40:17,839
question if that's okay

1125
00:40:23,510 --> 00:40:20,560
could you as best you know now

1126
00:40:26,870 --> 00:40:23,520
are you still looking at december

1127
00:40:27,829 --> 00:40:26,880
for the next flight and

1128
00:40:30,390 --> 00:40:27,839
will the

1129
00:40:33,109 --> 00:40:30,400
the first stage propulsion issue as best

1130
00:40:35,349 --> 00:40:33,119
you know now have any

1131
00:40:37,589 --> 00:40:35,359
any bearing on the scheduling or do you

1132
00:40:39,670 --> 00:40:37,599
have some flexibility in

1133
00:40:41,670 --> 00:40:39,680
flying that flight if it is in terms of

1134
00:40:44,309 --> 00:40:41,680
delivering needed supplies or bringing

1135
00:40:46,150 --> 00:40:44,319
things back

1136
00:40:48,309 --> 00:40:46,160
well let's see that flight you're

1137
00:40:51,349 --> 00:40:48,319
talking about spacex ii the spacex 2

1138
00:40:53,270 --> 00:40:51,359

flight is currently in january

1139
00:40:54,790 --> 00:40:53,280
they were supposed to move the first

1140
00:40:56,230 --> 00:40:54,800
stage

1141
00:40:59,270 --> 00:40:56,240
it's kind of all coming together but i

1142
00:41:01,190 --> 00:40:59,280
thought it was early last week

1143
00:41:03,030 --> 00:41:01,200
we have agreed together that leave the

1144
00:41:04,150 --> 00:41:03,040
stage in mcgregor for a little while

1145
00:41:05,589 --> 00:41:04,160
while the team

1146
00:41:06,870 --> 00:41:05,599
tries to get to root cause of the

1147
00:41:09,589 --> 00:41:06,880
anomaly

1148
00:41:11,510 --> 00:41:09,599
um and my understanding is we probably

1149
00:41:13,030 --> 00:41:11,520
have about another week or so before we

1150
00:41:14,470 --> 00:41:13,040
start pushing

1151
00:41:16,150 --> 00:41:14,480
the launch date

1152
00:41:17,750 --> 00:41:16,160
so that's kind of rough i'm trying to

1153
00:41:19,750 --> 00:41:17,760
remember in my head those exact dates

1154
00:41:21,589 --> 00:41:19,760
and they're not coming to me

1155
00:41:23,190 --> 00:41:21,599
so we have a little bit of flexibility

1156
00:41:25,430 --> 00:41:23,200
we start before we start affecting the

1157
00:41:27,670 --> 00:41:25,440
launch date the launch date itself in

1158
00:41:31,030 --> 00:41:27,680
january is not really critical

1159
00:41:32,630 --> 00:41:31,040
to the program from a supply standpoint

1160
00:41:34,790 --> 00:41:32,640
so we have some flexibility my

1161
00:41:37,109 --> 00:41:34,800
understanding however is that pushing

1162
00:41:39,190 --> 00:41:37,119
that flight

1163
00:41:42,950 --> 00:41:39,200

pushes spacex

1164
00:41:44,390 --> 00:41:42,960
the next spacex flight to iss spacex

1165
00:41:46,309 --> 00:41:44,400
3 because they're going to the new

1166
00:41:47,589 --> 00:41:46,319
version of the falcon 9

1167
00:41:49,270 --> 00:41:47,599
launch vehicle

1168
00:41:50,630 --> 00:41:49,280
they have to modify the pad and do some

1169
00:41:52,470 --> 00:41:50,640
things to get ready and they have some

1170
00:41:54,230 --> 00:41:52,480
other flights before ours on the new

1171
00:41:56,390 --> 00:41:54,240
falcon so

1172
00:41:58,790 --> 00:41:56,400
so any movement of that vehicle to the

1173
00:42:01,349 --> 00:41:58,800
right although not an impact to us from

1174
00:42:03,349 --> 00:42:01,359
a logistics standpoint for that flight

1175
00:42:05,510 --> 00:42:03,359
does impact

1176
00:42:07,270 --> 00:42:05,520
the next flight to iss at least today

1177
00:42:08,790 --> 00:42:07,280
that's on paper it looks that way i'm

1178
00:42:10,870 --> 00:42:08,800
sure there's some things they can do to

1179
00:42:13,589 --> 00:42:10,880
make make up a little bit of that so

1180
00:42:16,069 --> 00:42:13,599
there is a possibility that this

1181
00:42:17,349 --> 00:42:16,079
that resolving this anomaly will move

1182
00:42:20,630 --> 00:42:17,359
the the

1183
00:42:21,829 --> 00:42:20,640
falcon the spacex 2 flight a little bit

1184
00:42:23,990 --> 00:42:21,839
um

1185
00:42:25,750 --> 00:42:24,000
and it can move from our perspective

1186
00:42:27,510 --> 00:42:25,760
from a logistics perspective we're in

1187
00:42:28,950 --> 00:42:27,520
really good shape on orbit so we could

1188
00:42:31,349 --> 00:42:28,960

move

1189
00:42:33,990 --> 00:42:31,359
um quite a bit to the right and not

1190
00:42:35,750 --> 00:42:34,000
really be impacted by it so we've got

1191
00:42:38,309 --> 00:42:35,760
plenty of time to sort out the the root

1192
00:42:40,870 --> 00:42:38,319
cause the team is doing an excellent job

1193
00:42:43,510 --> 00:42:40,880
we've got a lot of folks involved

1194
00:42:45,510 --> 00:42:43,520
with our with our spacex friends

1195
00:42:48,069 --> 00:42:45,520
to try to get to root cause they're

1196
00:42:49,829 --> 00:42:48,079
reporting back to us weekly as we as we

1197
00:42:51,589 --> 00:42:49,839
try to sort through it

1198
00:42:53,430 --> 00:42:51,599
and as soon as we have something we can

1199
00:42:55,349 --> 00:42:53,440
hang our hat on we'll go look at the

1200
00:42:57,589 --> 00:42:55,359
stage we got at mcgregor and see if it

1201
00:42:59,030 --> 00:42:57,599
is susceptible to that

1202
00:43:02,550 --> 00:42:59,040
that failure mode and then we'll know

1203
00:43:03,589 --> 00:43:02,560
more about the impact of the next flight

1204
00:43:06,230 --> 00:43:03,599
yeah

1205
00:43:09,990 --> 00:43:06,240
i just wanted to follow up one more on

1206
00:43:13,030 --> 00:43:10,000
on the dragon uh the current dragon

1207
00:43:16,069 --> 00:43:13,040
mission um i think it was sort of noted

1208
00:43:18,309 --> 00:43:16,079
that that the payload was

1209
00:43:21,190 --> 00:43:18,319
light that's my term i'm not accusing

1210
00:43:22,550 --> 00:43:21,200
anyone of saying that but

1211
00:43:24,550 --> 00:43:22,560
will

1212
00:43:26,390 --> 00:43:24,560
do you anticipate i mean was that sort

1213
00:43:28,790 --> 00:43:26,400

of part of the plan that you could be

1214
00:43:29,750 --> 00:43:28,800
that flexible or would you anticipate

1215
00:43:34,550 --> 00:43:29,760
that

1216
00:43:37,109 --> 00:43:34,560
payload up

1217
00:43:38,710 --> 00:43:37,119
in the future or i just i guess i'm not

1218
00:43:41,510 --> 00:43:38,720
quite sure how you yeah i'll be glad to

1219
00:43:44,550 --> 00:43:41,520
address that um we have bought a certain

1220
00:43:46,630 --> 00:43:44,560
amount of up mass 20 metric tons over 12

1221
00:43:49,990 --> 00:43:46,640
flights and we will

1222
00:43:52,630 --> 00:43:50,000
get 20 metric tons over 12 flights

1223
00:43:54,470 --> 00:43:52,640
um we loaded up the international space

1224
00:43:56,710 --> 00:43:54,480
station with the last few shuttle

1225
00:43:58,390 --> 00:43:56,720
launches in order to have flexibility

1226
00:44:00,230 --> 00:43:58,400
and launch

1227
00:44:02,630 --> 00:44:00,240
in logistics needs

1228
00:44:06,230 --> 00:44:02,640
so as these flights move to the right

1229
00:44:08,790 --> 00:44:06,240
we would be able to accommodate it

1230
00:44:11,349 --> 00:44:08,800
all right so we work with our all of our

1231
00:44:12,550 --> 00:44:11,359
our partners and spacex is one of them

1232
00:44:14,710 --> 00:44:12,560
and

1233
00:44:17,349 --> 00:44:14,720
our spacex uh

1234
00:44:19,190 --> 00:44:17,359
folks were able to carry more capacity

1235
00:44:21,510 --> 00:44:19,200
on on that vehicle

1236
00:44:23,910 --> 00:44:21,520
uh had we needed it but we didn't have a

1237
00:44:25,750 --> 00:44:23,920
need for more up mass so

1238
00:44:27,190 --> 00:44:25,760

they came and said if you don't need the

1239
00:44:29,030 --> 00:44:27,200
upmass we have another customer that

1240
00:44:31,510 --> 00:44:29,040
we'd like to carry up

1241
00:44:33,750 --> 00:44:31,520
which we agreed to that was the orbcom

1242
00:44:35,910 --> 00:44:33,760
folks flying orbcom meant you also flew

1243
00:44:37,589 --> 00:44:35,920
some ballasts so so when you talk about

1244
00:44:40,470 --> 00:44:37,599
the mass of the orb com and the total

1245
00:44:42,630 --> 00:44:40,480
capability of the soi of the spacex

1246
00:44:44,390 --> 00:44:42,640
vehicle you you can't say wow what

1247
00:44:46,630 --> 00:44:44,400
happened to the missing up massive there

1248
00:44:48,470 --> 00:44:46,640
was a ballasting issue associated with

1249
00:44:50,710 --> 00:44:48,480
that that they also took care of but

1250
00:44:51,670 --> 00:44:50,720
they flew up the up mass that we needed

1251
00:44:53,750 --> 00:44:51,680
them to

1252
00:44:57,030 --> 00:44:53,760
that is all that counts towards the up

1253
00:44:59,510 --> 00:44:57,040
mass that we procured

1254
00:45:01,670 --> 00:44:59,520
and in compensation for that

1255
00:45:03,270 --> 00:45:01,680
they put some more capability on future

1256
00:45:05,750 --> 00:45:03,280
spacecraft

1257
00:45:07,750 --> 00:45:05,760
because we were flexible with them uh

1258
00:45:10,470 --> 00:45:07,760
and and what they gave us

1259
00:45:11,990 --> 00:45:10,480
uh income in return uh while still

1260
00:45:14,630 --> 00:45:12,000
maintaining the total up mass that

1261
00:45:16,790 --> 00:45:14,640
they're due over the 12 flights was the

1262
00:45:18,390 --> 00:45:16,800
capability to bring home even more can

1263
00:45:20,550 --> 00:45:18,400

powered

1264
00:45:21,670 --> 00:45:20,560
stowage coming down which is a critical

1265
00:45:26,309 --> 00:45:21,680
need for us

1266
00:45:28,710 --> 00:45:26,319
to keep our life sciences logistics flow

1267
00:45:32,630 --> 00:45:28,720
return up and down

1268
00:45:35,430 --> 00:45:32,640
taken care of so it was a very big

1269
00:45:38,069 --> 00:45:35,440
compensation for for the agency in that

1270
00:45:39,670 --> 00:45:38,079
respect and it also was a big help for

1271
00:45:41,829 --> 00:45:39,680
spacex because they're able to take care

1272
00:45:43,270 --> 00:45:41,839
of their other customer so it's mutually

1273
00:45:44,870 --> 00:45:43,280
agreed to we still have all the same up

1274
00:45:47,270 --> 00:45:44,880
mass we had planned to we didn't need

1275
00:45:49,270 --> 00:45:47,280
this up mass and we got extra capability

1276
00:45:53,510 --> 00:45:49,280
out of the vehicle so it was a

1277
00:45:58,829 --> 00:45:55,829
just one quick follow-up on uh on the

1278
00:46:01,270 --> 00:45:58,839
radiator just remembering deploying

1279
00:46:03,430 --> 00:46:01,280
of long-packed

1280
00:46:06,630 --> 00:46:03,440
solar arrays is there any stickage

1281
00:46:08,390 --> 00:46:06,640
issues um and is there any concern

1282
00:46:15,510 --> 00:46:08,400
if there are stickage issues do you have

1283
00:46:19,510 --> 00:46:17,109
you know the one thing is it's not it's

1284
00:46:21,109 --> 00:46:19,520
not a solar array so the mechanism is

1285
00:46:22,630 --> 00:46:21,119
you know we were very careful about

1286
00:46:23,589 --> 00:46:22,640
solar arrays and

1287
00:46:25,270 --> 00:46:23,599
and uh

1288
00:46:27,670 --> 00:46:25,280

you know solar arrays are considerably

1289
00:46:29,829 --> 00:46:27,680
more flexible on the um

1290
00:46:33,109 --> 00:46:29,839
on the uh the mechanism it's this

1291
00:46:35,670 --> 00:46:33,119
scissors mechanism and it's it's um

1292
00:46:38,150 --> 00:46:35,680
it it doesn't really stick we've never

1293
00:46:41,190 --> 00:46:38,160
had issues with deployments or

1294
00:46:45,589 --> 00:46:41,200
or retractions and we've we've done them

1295
00:46:48,390 --> 00:46:45,599
a bunch of times on on these radiators

1296
00:46:49,990 --> 00:46:48,400
okay do you know anything okay wrap it

1297
00:46:52,630 --> 00:46:50,000
up for us we want to remind you that our

1298
00:46:54,950 --> 00:46:52,640
coverage on november 1st will begin at 6

1299
00:46:57,510 --> 00:46:54,960
15 a.m central time that's going to be 7

1300
00:46:59,430 --> 00:46:57,520
15 a.m eastern time the space walk

1301
00:47:02,390 --> 00:46:59,440
itself as you heard will begin about an

1302
00:47:03,829 --> 00:47:02,400
hour later at 7 15 a.m central time 8 15

1303
00:47:06,470 --> 00:47:03,839
a.m eastern time and of course we'll

1304
00:47:08,069 --> 00:47:06,480
have live coverage of the entire thing

1305
00:47:09,750 --> 00:47:08,079
another programming reminder coming up

1306
00:47:11,270 --> 00:47:09,760
this sunday we will have live coverage

1307
00:47:13,589 --> 00:47:11,280
of the farewell and departure of the

1308
00:47:15,750 --> 00:47:13,599
dragon spacecraft from the international

1309
00:47:18,069 --> 00:47:15,760
space station our coverage will begin at

1310
00:47:19,750 --> 00:47:18,079
6 00 a.m central time the actual release

1311
00:47:23,190 --> 00:47:19,760
will take place almost two and a half

1312
00:47:24,790 --> 00:47:23,200
hours later at 8 26 a.m central

1313
00:47:26,710 --> 00:47:24,800

we will wrap up our coverage soon after

1314
00:47:28,390 --> 00:47:26,720
dragon actually departs the vicinity of

1315
00:47:29,910 --> 00:47:28,400
the orbiting complex

1316
00:47:32,950 --> 00:47:29,920
but the deorbit burn for dragon will

1317
00:47:35,190 --> 00:47:32,960
take place at 1 28 p.m central with a

1318
00:47:38,390 --> 00:47:35,200
splash down about 250 miles off the

1319
00:47:40,870 --> 00:47:38,400
coast of california around 2 20 p.m

1320
00:47:42,549 --> 00:47:40,880
central time we will not have that live

1321
00:47:44,069 --> 00:47:42,559
on nasa television but you can follow

1322
00:47:46,069 --> 00:47:44,079
the latest in terms of the orbit burn

1323
00:47:48,549 --> 00:47:46,079
and the confirmation of the splashdown

1324
00:47:53,829 --> 00:47:48,559
on both spacex's website and the nasa

1325
00:47:56,630 --> 00:47:55,109
station we want to thank you for joining