1
00:00:07,670 --> 00:00:02,470
on the ui a

2
00:00:09,509 --> 00:00:07,680
sweet power ev1 to 202 of offs okay

3
00:00:11,190 --> 00:00:09,519
power ev1

4
00:00:19,029 --> 00:00:11,200
off

5
00:00:20,950 --> 00:00:19,039
begun at 601 a.m central time 701 a.m

6
00:00:23,109 --> 00:00:20,960
eastern time mike hopkins and rick

7
00:00:31,589 --> 00:00:23,119
mastracchio now officially you wanted

8
00:00:34,950 --> 00:00:33,270
so rick mastracchio there has made his

9
00:00:37,030 --> 00:00:34,960
way out he's got the suit with the red

10
00:00:42,310 --> 00:00:37,040
stripe mike hopkins making his way out

11
00:00:46,549 --> 00:00:44,389
and say again the distance to station

12
00:00:49,750 --> 00:00:46,559
stubborn less than half a meter so

13
00:00:51,670 --> 00:00:49,760

there's a good look at the actual uh

14
00:00:52,709 --> 00:00:51,680
module itself you see both the fluid

15
00:00:56,830 --> 00:00:52,719
lines there in the middle and the

16
00:01:00,549 --> 00:00:59,029
it tracy let's talk about this for a

17
00:01:03,270 --> 00:01:00,559
second because you're very familiar with

18
00:01:04,869 --> 00:01:03,280
this work site these quick disconnects

19
00:01:06,710 --> 00:01:04,879
can be a little bit tricky can't they

20
00:01:08,789 --> 00:01:06,720
they certainly can they are our largest

21
00:01:11,350 --> 00:01:08,799
quick disconnects on on orbit

22
00:01:13,590 --> 00:01:11,360
and when uh we did this

23
00:01:16,950 --> 00:01:13,600
task on

24
00:01:19,670 --> 00:01:16,960
in 2010 those lines were pressurized up

25
00:01:20,390 --> 00:01:19,680
to about 360 psi which made

26
00:01:22,469 --> 00:01:20,400
the

27
00:01:24,310 --> 00:01:22,479
operation a lot more difficult we have

28
00:01:30,710 --> 00:01:24,320
since reduced the pressure for these

29
00:01:34,069 --> 00:01:32,069
yep looks good

30
00:01:35,350 --> 00:01:34,079
hey thanks rick

31
00:01:37,109 --> 00:01:35,360
as we continue to take a look at rick

32
00:01:38,830 --> 00:01:37,119
mastranco's helmet cam here

33
00:01:41,590 --> 00:01:38,840
the crew getting

34
00:01:44,310 --> 00:01:41,600
this pump removal underway they're just

35
00:01:47,109 --> 00:01:44,320
undoing some wire ties that uh tracy you

36
00:01:48,469 --> 00:01:47,119
and doug both did back three years ago

37
00:01:51,749 --> 00:01:48,479
yes um

38
00:02:07,190 --> 00:01:51,759

just basically wind the tethers for all

39
00:02:12,309 --> 00:02:09,830
awesome thanks rick

40
00:02:15,750 --> 00:02:12,319
it's demated pull back on the release

41
00:02:19,270 --> 00:02:17,830
yep so now we're in 46 minutes into

42
00:02:21,030 --> 00:02:19,280
today's spacewalk the first of these

43
00:02:27,270 --> 00:02:21,040
ammonia lines has been disconnected and

44
00:02:30,630 --> 00:02:28,790
this is mission control houston one hour

45
00:02:31,589 --> 00:02:30,640
56 minutes into today spacewalk two of

46
00:02:33,430 --> 00:02:31,599
these ammonia lines have been

47
00:02:36,390 --> 00:02:33,440
disconnected especially this bigger one

48
00:02:38,070 --> 00:02:36,400
that gave some problems back in 2010 but

49
00:02:39,990 --> 00:02:38,080
to rick mastracchio mike hopkins made

50
00:02:41,670 --> 00:02:40,000
quick work of it he was talking about

51
00:02:43,830 --> 00:02:41,680
some snow that he saw now that is frozen

52
00:02:45,350 --> 00:02:43,840
pneumonia coming out of those lines

53
00:02:47,670 --> 00:02:45,360
obviously they watch ammonia pretty

54
00:02:49,750 --> 00:02:47,680
closely uh they did confirm that some of

55
00:02:51,110 --> 00:02:49,760
it did get on his suit but tracy let's

56
00:02:52,790 --> 00:02:51,120
talk about what they would do i mean

57
00:02:54,710 --> 00:02:52,800
there's a procedure to take care of that

58
00:02:57,110 --> 00:02:54,720
right

59
00:02:59,110 --> 00:02:57,120
yeah when they um

60
00:03:01,350 --> 00:02:59,120
so what i imagine got on his suit was

61
00:03:03,030 --> 00:03:01,360
solid and um the solid does not

62
00:03:05,110 --> 00:03:03,040
penetrate the suit it just bounces off

63
00:03:07,350 --> 00:03:05,120

but but for the uh

64
00:03:09,350 --> 00:03:07,360
but just for the uh

65
00:03:12,149 --> 00:03:09,360
mating the cutie it's the big one the m3

66
00:03:14,149 --> 00:03:12,159
line we're gonna make that one first

67
00:03:16,309 --> 00:03:14,159
just for the

68
00:03:17,670 --> 00:03:16,319
safety protocol we'll do what's called a

69
00:03:19,589 --> 00:03:17,680
bake out though and

70
00:03:21,509 --> 00:03:19,599
they can be baking out during the time

71
00:03:23,110 --> 00:03:21,519
they're doing a task it'll just be

72
00:03:25,350 --> 00:03:23,120
correlated to what the time would be if

73
00:03:26,710 --> 00:03:25,360
they were inside the crew lock

74
00:03:27,750 --> 00:03:26,720
and then they'll do some testing once

75
00:03:31,030 --> 00:03:27,760
they get in the crew lock this will be

76
00:03:33,350 --> 00:03:31,040
at the end of the yeah into the ava

77
00:03:35,670 --> 00:03:33,360
so the last of the fluid disconnects has

78
00:03:36,949 --> 00:03:35,680
been removed from this pump module so

79
00:03:38,630 --> 00:03:36,959
all of the ammonia lines have been

80
00:03:39,910 --> 00:03:38,640
disconnected at this point male and

81
00:03:41,990 --> 00:03:39,920
female

82
00:03:43,030 --> 00:03:42,000
qd for debris damage and ammonia

83
00:03:45,270 --> 00:03:43,040
crystals

84
00:03:48,070 --> 00:03:45,280
and about about like the m1 line and the

85
00:03:49,270 --> 00:03:48,080
ammonia crystals rick

86
00:03:50,550 --> 00:03:49,280
so what they will do is go ahead and

87
00:03:52,070 --> 00:03:50,560
begin the process of removing the

88
00:03:52,949 --> 00:03:52,080

electrical connectors from the failed

89
00:03:54,070 --> 00:03:52,959
pump

90
00:03:55,589 --> 00:03:54,080
and then they will actually remove it

91
00:03:56,949 --> 00:03:55,599
and put it on what you will hear called

92
00:03:58,390 --> 00:03:56,959
a poa

93
00:04:00,149 --> 00:03:58,400
this is basically just an attachment

94
00:04:02,630 --> 00:04:00,159
point a temporary stowage location

95
00:04:04,149 --> 00:04:02,640
outside the station for pieces of

96
00:04:08,550 --> 00:04:04,159
hardware

97
00:04:11,670 --> 00:04:10,390
so the crew is reporting to the ground

98
00:04:13,110 --> 00:04:11,680
teams that all the different electrical

99
00:04:14,949 --> 00:04:13,120
connectors have been removed from the

100
00:04:16,710 --> 00:04:14,959
failed pump

101
00:04:18,550 --> 00:04:16,720
itself so coming up they're going to be

102
00:04:25,830 --> 00:04:18,560
removing the pump actually from where it

103
00:04:31,670 --> 00:04:28,150
again this pump was 780 pounds is about

104
00:04:34,870 --> 00:04:33,590
how many more there's a second half i

105
00:04:37,350 --> 00:04:34,880
can see you need to come off about

106
00:04:39,189 --> 00:04:37,360
another eight inches

107
00:04:40,629 --> 00:04:39,199
okay let me try to do it

108
00:04:43,749 --> 00:04:40,639
hey yeah

109
00:04:45,510 --> 00:04:43,759
station forward just

110
00:04:47,670 --> 00:04:45,520
five or ten centimeters

111
00:04:51,430 --> 00:04:47,680
to the station forward ten centimeters

112
00:04:51,440 --> 00:04:59,990
arms in motion

113
00:05:03,830 --> 00:05:01,189

this view on board the international

114
00:05:05,909 --> 00:05:03,840
space station as it flies 261 miles

115
00:05:07,830 --> 00:05:05,919
above the south pacific ocean gives you

116
00:05:10,070 --> 00:05:07,840
a pretty dramatic view here of exactly

117
00:05:13,110 --> 00:05:10,080
how big this pump is you get a sense of

118
00:05:16,150 --> 00:05:13,120
just the sheer size of it

119
00:05:17,430 --> 00:05:16,160
rick mastracchio still hanging on to it

120
00:05:20,710 --> 00:05:17,440
mike hopkins there on the right hand

121
00:05:24,710 --> 00:05:23,270
so tracy as we take a look at this

122
00:05:27,110 --> 00:05:24,720
tell everybody what we're looking at

123
00:05:29,189 --> 00:05:27,120
well on the right side of the screen you

124
00:05:30,950 --> 00:05:29,199
see the what we're calling the poa which

125
00:05:33,029 --> 00:05:30,960
is the um

126
00:05:35,749 --> 00:05:33,039
receptacle it basically duplicates the

127
00:05:37,189 --> 00:05:35,759
end of the robotic arm and it's grabbing

128
00:05:39,110 --> 00:05:37,199
a hold of what's on the left side which

129
00:05:41,430 --> 00:05:39,120
is the pump module that rick you see at

130
00:05:43,749 --> 00:05:41,440
the bottom left is holding and that

131
00:05:45,270 --> 00:05:43,759
adjustable grapple bar the agb was

132
00:05:47,189 --> 00:05:45,280
attached to the pump module and it is

133
00:05:49,189 --> 00:05:47,199
now the interface between the pump

134
00:05:50,150 --> 00:05:49,199
module and the poet that's holding it in

135
00:05:52,550 --> 00:05:50,160
place

136
00:05:55,510 --> 00:05:52,560
and koichi the arm operator is not only

137
00:05:57,270 --> 00:05:55,520
operating um the arm to bring rick and

138
00:05:59,430 --> 00:05:57,280

the pump module into the power but he

139
00:06:02,070 --> 00:05:59,440
also will switch

140
00:06:03,189 --> 00:06:02,080
screens and then control the poa itself

141
00:06:05,110 --> 00:06:03,199
and then

142
00:06:07,430 --> 00:06:05,120
activate the snares to

143
00:06:08,950 --> 00:06:07,440
wrap around the grapple fixture that is

144
00:06:11,189 --> 00:06:08,960
attached to the pump module and it'll

145
00:06:12,629 --> 00:06:11,199
hold it secure in place whenever you're

146
00:06:14,070 --> 00:06:12,639
working with equipment this big i mean

147
00:06:16,070 --> 00:06:14,080
you know obviously we've never been up

148
00:06:17,510 --> 00:06:16,080
there but it looks it looks like it'd be

149
00:06:18,710 --> 00:06:17,520
a little bit hard to kind of guide this

150
00:06:20,390 --> 00:06:18,720
stuff in whenever you're talking about

151
00:06:22,309 --> 00:06:20,400
equipment that's that big in nature it's

152
00:06:23,990 --> 00:06:22,319
kind of hard to see absolutely and you

153
00:06:25,830 --> 00:06:24,000
can see where rick is his eyes are now

154
00:06:27,189 --> 00:06:25,840
looking right at a pump module that's

155
00:06:28,950 --> 00:06:27,199
his view through his helmet camera

156
00:06:31,670 --> 00:06:28,960
you're seeing right there he can't see

157
00:06:33,749 --> 00:06:31,680
the grapple fixture and that's what um

158
00:06:35,590 --> 00:06:33,759
koichi is looking at through a camera

159
00:06:38,230 --> 00:06:35,600
that's mounted on the top side of the

160
00:06:39,590 --> 00:06:38,240
poa and he can see an alignment pin

161
00:06:40,870 --> 00:06:39,600
that's helping him

162
00:06:43,909 --> 00:06:40,880
give

163
00:06:46,469 --> 00:06:43,919

directions to rick as well as his own

164
00:06:48,710 --> 00:06:46,479
inputs koichi's inputs into the arm to

165
00:06:50,309 --> 00:06:48,720
bring the pump module into the poa yeah

166
00:06:57,430 --> 00:06:50,319
looks like they got it secured so it

167
00:07:00,790 --> 00:06:58,790
this is mission control houston we're

168
00:07:02,870 --> 00:07:00,800
now five hours and nine minutes into

169
00:07:04,150 --> 00:07:02,880
today's spacewalk what they're doing

170
00:07:05,909 --> 00:07:04,160
is pretty much cleaning up the

171
00:07:07,430 --> 00:07:05,919
activities for today this should last

172
00:07:10,070 --> 00:07:07,440
about another 30 minutes and that should

173
00:07:12,150 --> 00:07:10,080
end today's spacewalk they were very far

174
00:07:13,350 --> 00:07:12,160
ahead of the timeline today

175
00:07:16,230 --> 00:07:13,360
they did go ahead and get the pump

176
00:07:17,589 --> 00:07:16,240
module removed from where it was

177
00:07:19,189 --> 00:07:17,599
where it had been over the last several

178
00:07:20,469 --> 00:07:19,199
years and put up on this payload

179
00:07:21,510 --> 00:07:20,479
attachment point that's where it will

180
00:07:24,870 --> 00:07:21,520
stay

181
00:07:27,909 --> 00:07:26,390
and they did offer the crew the chance

182
00:07:30,150 --> 00:07:27,919
to go ahead and start doing some forward

183
00:07:32,230 --> 00:07:30,160
work on the new pump all that was

184
00:07:34,469 --> 00:07:32,240
supposed to be done on the second eda in

185
00:07:36,309 --> 00:07:34,479
the third eva that are planned for on

186
00:07:37,430 --> 00:07:36,319
monday and wednesday but the crew

187
00:07:39,670 --> 00:07:37,440
deferred and said we'll go ahead and

188
00:07:40,790 --> 00:07:39,680

take care of that on monday uh there are

189
00:07:42,070 --> 00:07:40,800
no rush to go ahead and get that done

190
00:07:43,990 --> 00:07:42,080
today because there's plenty of time to

191
00:07:45,749 --> 00:07:44,000
do it on monday so this was kind of a

192
00:07:47,189 --> 00:07:45,759
good stopping point for the crew sort of

193
00:07:49,189 --> 00:07:47,199
the first chapter

194
00:07:51,110 --> 00:07:49,199
of this spacewalk coming to a close as

195
00:07:53,430 --> 00:07:51,120
they got the old one the old pump taken

196
00:07:55,110 --> 00:07:53,440
care of so rick mastracchio who is the

197
00:07:56,950 --> 00:07:55,120
lead spacewalker today decided to go

198
00:07:59,270 --> 00:07:56,960
ahead and

199
00:08:01,110 --> 00:07:59,280
wrap up things and they will go ahead