1
00:00:04,309 --> 00:00:02,070
this is mission control houston now an

2
00:00:06,389 --> 00:00:04,319
hour and 15 minutes into today's uh

3
00:00:08,150 --> 00:00:06,399
planned seven-hour spacewalk to replace

4
00:00:09,830 --> 00:00:08,160
a failed pump unit as part of the

5
00:00:11,669 --> 00:00:09,840
cooling system on the exterior of the

6
00:00:13,990 --> 00:00:11,679
international space station

7
00:00:16,070 --> 00:00:14,000
tracy caldwell dyson and doug wheelock

8
00:00:18,390 --> 00:00:16,080
moving along and doing a good job of

9
00:00:19,429 --> 00:00:18,400
keeping on on the timeline for their

10
00:00:20,630 --> 00:00:19,439
tasks

11
00:00:23,509 --> 00:00:20,640
both of them

12
00:00:26,310 --> 00:00:23,519
working at the s1 area of the truss

13
00:00:27,750 --> 00:00:26,320

structure as they prepare to remove the

14
00:00:35,990 --> 00:00:27,760
failed pump module from the cooling

15
00:00:38,709 --> 00:00:37,350
down at the very bottom where it meets

16
00:00:39,910 --> 00:00:38,719
the cedar rail

17
00:00:42,389 --> 00:00:39,920
uh

18
00:00:43,910 --> 00:00:42,399
the truss spins out there it gets a

19
00:00:45,910 --> 00:00:43,920
little bit thinner i'm going to wrap a

20
00:00:48,229 --> 00:00:45,920
long wire tie around there and temps

21
00:00:49,670 --> 00:00:48,239
throw those spins inside of the truss on

22
00:00:52,950 --> 00:00:49,680
that on that

23
00:00:58,709 --> 00:00:52,960
on that truss member hi copy wheels

24
00:01:03,270 --> 00:01:01,270
again all this work uh is uh

25
00:01:06,310 --> 00:01:03,280
ongoing now because of a failure that

26
00:01:08,469 --> 00:01:06,320
occurred last saturday uh of the pump

27
00:01:10,789 --> 00:01:08,479
module that's used to circulate ammonia

28
00:01:12,710 --> 00:01:10,799
through the huge radiators that are used

29
00:01:14,630 --> 00:01:12,720
to get rid of excess heat generated by

30
00:01:18,149 --> 00:01:14,640
the electronic components on board the

31
00:01:23,270 --> 00:01:21,190
crew successfully installed several

32
00:01:26,070 --> 00:01:23,280
jumpers that allowed for

33
00:01:28,630 --> 00:01:26,080
the best possible redundancy of station

34
00:01:31,350 --> 00:01:28,640
systems since some of the external

35
00:01:33,990 --> 00:01:31,360
systems on the station are

36
00:01:36,310 --> 00:01:34,000
cooled by only one of the two redundant

37
00:01:38,390 --> 00:01:36,320
cooling loops a and b of this ammonia

38
00:01:40,550 --> 00:01:38,400

system

39
00:01:42,630 --> 00:01:40,560
again the ammonia is used on the outside

40
00:01:45,429 --> 00:01:42,640
of the cysts of the station to reject

41
00:01:48,469 --> 00:01:45,439
the excess heat and a heat exchanger

42
00:01:50,149 --> 00:01:48,479
allows it to take the excess heat from

43
00:01:52,230 --> 00:01:50,159
the water-based cooling system on the

44
00:01:54,310 --> 00:01:52,240
inside of the station throughout this

45
00:01:56,550 --> 00:01:54,320
past week while flight controllers on

46
00:01:59,510 --> 00:01:56,560
the ground work to develop procedures

47
00:02:01,990 --> 00:01:59,520
for this pump removal and replacement

48
00:02:03,510 --> 00:02:02,000
the conditions inside the station have

49
00:02:05,910 --> 00:02:03,520
been pretty much normal for the

50
00:02:08,309 --> 00:02:05,920
international space station crew

51
00:02:10,229 --> 00:02:08,319
thanks to some work they did immediately

52
00:02:12,630 --> 00:02:10,239
after the failure to configure those

53
00:02:16,630 --> 00:02:12,640
jumpers so that the best possible system

54
00:02:20,229 --> 00:02:18,390
after they uh if

55
00:02:22,470 --> 00:02:20,239
that's what we were just talking

56
00:02:23,990 --> 00:02:22,480
the biggest change to the crew has been

57
00:02:25,510 --> 00:02:24,000
that they have refocused their

58
00:02:28,390 --> 00:02:25,520
attentions from the scientific

59
00:02:30,550 --> 00:02:28,400
investigations inside the station on to

60
00:02:32,150 --> 00:02:30,560
uh preparations for the spacewalk they

61
00:02:34,710 --> 00:02:32,160
had been already scheduled to conduct a

62
00:02:36,949 --> 00:02:34,720
spacewalk on thursday but it was for a

63
00:02:39,190 --> 00:02:36,959

completely different purpose uh those

64
00:02:41,750 --> 00:02:39,200
tasks have been uh put off until we can

65
00:02:48,309 --> 00:02:41,760
complete this uh more critical removal

66
00:02:52,550 --> 00:02:50,309
it was the plan that i would um

67
00:02:54,070 --> 00:02:52,560
straighten the arms and then uh

68
00:02:55,190 --> 00:02:54,080
right so what you'll do is release the

69
00:02:57,110 --> 00:02:55,200
cord

70
00:02:58,550 --> 00:02:57,120
yep you'll release the wire ties

71
00:03:00,550 --> 00:02:58,560
straighten the arm out and you'll have

72
00:03:01,509 --> 00:03:00,560
to deploy that sleeve over the locks the

73
00:03:03,430 --> 00:03:01,519
uh

74
00:03:05,509 --> 00:03:03,440
arm straight out

75
00:03:08,949 --> 00:03:05,519
and then you'll lay the arms

76
00:03:08,959 --> 00:03:23,830
okay

77
00:03:28,229 --> 00:03:26,390
this is mission control houston oscar

78
00:03:29,990 --> 00:03:28,239
koehler the intravehicular activity

79
00:03:32,550 --> 00:03:30,000
support officer here in mission control

80
00:03:33,750 --> 00:03:32,560
ready going up to doug wheelock

81
00:03:35,670 --> 00:03:33,760
that the

82
00:03:37,589 --> 00:03:35,680
eva folks here on the ground are seeing

83
00:03:39,190 --> 00:03:37,599
that these quick disconnect valves on

84
00:03:40,470 --> 00:03:39,200
the ammonia lines that he's going to be

85
00:03:43,509 --> 00:03:40,480
removing

86
00:03:47,110 --> 00:03:43,519
are not lining up you can see the center

87
00:03:49,670 --> 00:03:47,120
line there is m2 it has a white area

88
00:03:52,149 --> 00:03:49,680

that is exposed that shows that the bale

89
00:03:54,710 --> 00:03:52,159
is in the full open position on the two

90
00:03:57,350 --> 00:03:54,720
outside lines the m1 and the m3 we're

91
00:04:00,789 --> 00:03:57,360
not seeing that white line and so we

92
00:04:02,550 --> 00:04:00,799
luck is being offered the opportunity to

93
00:04:04,470 --> 00:04:02,560
check that and make sure that those are

94
00:04:06,070 --> 00:04:04,480
in the full open position

95
00:04:07,830 --> 00:04:06,080
he's got a special tool he's pulling out

96
00:04:09,350 --> 00:04:07,840
of his tool bag right now that'll he can

97
00:04:11,190 --> 00:04:09,360
use to get some additional leverage if

98
00:04:13,910 --> 00:04:11,200
he needs to to make that

99
00:04:15,509 --> 00:04:13,920
set up properly connected up so that

100
00:04:18,310 --> 00:04:15,519
he's ready to go with

101
00:04:20,629 --> 00:04:18,320
removing those ammonia lines they want

102
00:04:22,790 --> 00:04:20,639
to make sure that they're completely

103
00:04:25,030 --> 00:04:22,800
open so that they're disconnected and

104
00:04:26,950 --> 00:04:25,040
that is expected to help

105
00:04:28,390 --> 00:04:26,960
minimize the release of any ammonia

106
00:04:30,469 --> 00:04:28,400
which we don't want contaminating the

107
00:04:31,830 --> 00:04:30,479
space walker spacesuits we're talking

108
00:04:33,670 --> 00:04:31,840
about do we want you to push the button

109
00:04:43,590 --> 00:04:33,680
or not push the button

110
00:04:43,600 --> 00:04:57,670
good for girls

111
00:05:01,189 --> 00:04:59,670
okay

112
00:05:02,150 --> 00:05:01,199
pull me forward

113
00:05:19,590 --> 00:05:02,160

okay

114
00:05:19,600 --> 00:05:33,670
uh

115
00:05:37,670 --> 00:05:35,350
okay oscar

116
00:05:40,070 --> 00:05:37,680
it's hung up again where

117
00:05:43,749 --> 00:05:40,080
i got a full white band but the button

118
00:05:46,310 --> 00:05:43,759
is stuck down it's not extended so

119
00:05:59,749 --> 00:05:46,320
i should try to open it again yeah

120
00:06:03,909 --> 00:06:01,909
wheels if you want uh

121
00:06:05,830 --> 00:06:03,919
we think the scoop may give you a little

122
00:06:08,150 --> 00:06:05,840
better hammer you have a go to attempt

123
00:06:11,909 --> 00:06:08,160
with the scoop

124
00:06:11,919 --> 00:06:27,590
okay

125
00:06:31,430 --> 00:06:29,590
and wheels if you want to pull and try

126
00:06:47,029 --> 00:06:31,440
to hammer tap at the same time that's

127
00:06:50,629 --> 00:06:49,350
okay it's full forward doctor

128
00:06:53,350 --> 00:06:50,639
awesome

129
00:06:54,390 --> 00:06:53,360
push that button down

130
00:06:56,950 --> 00:06:54,400
okay

131
00:07:10,309 --> 00:06:56,960
let me get that lever

132
00:07:10,319 --> 00:07:29,029
no snap back again no kickback it's okay

133
00:07:35,510 --> 00:07:30,230
there's a there's a big round of

134
00:07:35,520 --> 00:07:40,150
it will fall yeah we get it here we go

135
00:07:45,830 --> 00:07:43,430
congratulations so at 12 20 p.m central

136
00:07:49,110 --> 00:07:45,840
time doug wheelock

137
00:07:50,950 --> 00:07:49,120
using a scoop tool to bang on the

138
00:07:52,150 --> 00:07:50,960

detention button on that bockey

139
00:07:54,390 --> 00:07:52,160
connector

140
00:07:56,550 --> 00:07:54,400
he succeeded in

141
00:07:59,430 --> 00:07:56,560
closing the valve so that

142
00:08:01,430 --> 00:07:59,440
he can make final preparations to

143
00:08:02,950 --> 00:08:01,440
demate that device we're still standing

144
00:08:05,430 --> 00:08:02,960
by to hear whether or not that's what

145
00:08:07,589 --> 00:08:05,440
they want to do here in mission control

146
00:08:10,070 --> 00:08:07,599
but applause in the control room as he

147
00:08:21,830 --> 00:08:10,080
was able to get that bail open and

148
00:08:21,840 --> 00:08:37,589
that was a little 40 right there

149
00:08:42,790 --> 00:08:40,230
this is mission control houston now six

150
00:08:44,870 --> 00:08:42,800
hours 26 minutes into today's spacewalk

151
00:08:46,389 --> 00:08:44,880
by doug wheelock and tracy caldwell

152
00:08:48,630 --> 00:08:46,399
dyson

153
00:08:50,070 --> 00:08:48,640
the team on the ground has worked with

154
00:08:52,470 --> 00:08:50,080
the crew to

155
00:08:54,389 --> 00:08:52,480
put this final connector that has been

156
00:08:56,710 --> 00:08:54,399
bulky throughout the spacewalk into a

157
00:08:58,870 --> 00:08:56,720
safe configuration they've reinstalled

158
00:09:01,110 --> 00:08:58,880
it onto its connection on the pump

159
00:09:02,310 --> 00:09:01,120
module and installed a spool positioning

160
00:09:06,070 --> 00:09:02,320
device

161
00:09:07,430 --> 00:09:06,080
quick disconnects to allow them to

162
00:09:08,790 --> 00:09:07,440
function

163
00:09:10,870 --> 00:09:08,800

optimally

164
00:09:13,030 --> 00:09:10,880
these devices have been installed around

165
00:09:14,949 --> 00:09:13,040
the station on these fluid lines in many

166
00:09:17,190 --> 00:09:14,959
different locations

167
00:09:18,150 --> 00:09:17,200
there has been evidence of some leakage

168
00:09:20,870 --> 00:09:18,160
of the

169
00:09:22,870 --> 00:09:20,880
ammonia from within the system

170
00:09:25,670 --> 00:09:22,880
and that has clearly come in contact

171
00:09:29,030 --> 00:09:25,680
with the space walkers uh in several

172
00:09:30,710 --> 00:09:29,040
different uh times during the spacewalk

173
00:09:31,430 --> 00:09:30,720
just

174
00:09:33,269 --> 00:09:31,440
to

175
00:09:35,350 --> 00:09:33,279
qualify that

176
00:09:36,870 --> 00:09:35,360
ammonia is a hazardous substance but

177
00:09:38,710 --> 00:09:36,880
this is by no means the first time

178
00:09:41,110 --> 00:09:38,720
spacewalkers have come into contact with

179
00:09:43,670 --> 00:09:41,120
ammonia outside the space station

180
00:09:45,269 --> 00:09:43,680
there is a standard procedure for

181
00:09:47,750 --> 00:09:45,279
inspection of each of the two space

182
00:09:49,509 --> 00:09:47,760
walker spacesuits to look for any

183
00:09:52,790 --> 00:09:49,519
visible evidence of ammonia that might

184
00:09:54,710 --> 00:09:52,800
be clinging to their spacesuits and they

185
00:09:56,790 --> 00:09:54,720
will have a specific period of time in

186
00:09:59,190 --> 00:09:56,800
which they will basically bake out in

187
00:10:00,470 --> 00:09:59,200
the vacuum of space so that any residual

188
00:10:02,870 --> 00:10:00,480

ammonia can