
PAO

1
00:00:04,550 --> 00:00:02,869
joining me now is kenny todd the

2
00:00:06,789 --> 00:00:04,560
operation integrations manager for the

3
00:00:08,870 --> 00:00:06,799
international space station now kenny

4
00:00:10,230 --> 00:00:08,880
first off thanks for joining me uh so

5
00:00:12,470 --> 00:00:10,240
you were here last week when we were

6
00:00:14,070 --> 00:00:12,480
just starting to look at the problem and

7
00:00:15,589 --> 00:00:14,080
analyze it why don't you just give me

8
00:00:17,590 --> 00:00:15,599
kind of an update what happened over the

9
00:00:19,910 --> 00:00:17,600
weekend and where are we now

10
00:00:21,910 --> 00:00:19,920
sure you bet um let's see when we talked

11
00:00:23,750 --> 00:00:21,920
last week at that time we were still

12
00:00:26,070 --> 00:00:23,760
pretty fresh into this

13
00:00:28,070 --> 00:00:26,080

this particular issue and the the

14
00:00:30,230 --> 00:00:28,080
flow control valve was really the focus

15
00:00:31,429 --> 00:00:30,240
of our our effort in trying to recover

16
00:00:33,510 --> 00:00:31,439
it and

17
00:00:34,549 --> 00:00:33,520
since that time frame it's become

18
00:00:35,830 --> 00:00:34,559
apparent to us through all the

19
00:00:37,510 --> 00:00:35,840
evaluations that we've done that the

20
00:00:40,150 --> 00:00:37,520
flow control valve is not available to

21
00:00:43,270 --> 00:00:40,160
us to to continue regulating temperature

22
00:00:45,590 --> 00:00:43,280
in this this particular ammonia loop

23
00:00:46,950 --> 00:00:45,600
at that point we uh we started expanding

24
00:00:48,229 --> 00:00:46,960
out from that valve looking at the rest

25
00:00:49,910 --> 00:00:48,239
of the system and looking to see if

26
00:00:52,229 --> 00:00:49,920
there's other ways that we could provide

27
00:00:55,830 --> 00:00:52,239
some temperature control into that loop

28
00:00:59,110 --> 00:00:55,840
um and uh and we did uh find and i what

29
00:01:01,270 --> 00:00:59,120
we term an isolation valve that is just

30
00:01:05,750 --> 00:01:01,280
upstream of this of this particular flow

31
00:01:09,429 --> 00:01:07,510
in the current way it was being used it

32
00:01:10,310 --> 00:01:09,439
was a binary valve it was either open or

33
00:01:12,390 --> 00:01:10,320
closed

34
00:01:13,510 --> 00:01:12,400
for the for the ammonia coming from the

35
00:01:15,429 --> 00:01:13,520
radiator

36
00:01:16,630 --> 00:01:15,439
and so the team did a great job at

37
00:01:19,270 --> 00:01:16,640
looking and seeing can we use that

38
00:01:21,270 --> 00:01:19,280

particular valve as as a a regulator if

39
00:01:22,950 --> 00:01:21,280
you will to uh to

40
00:01:25,270 --> 00:01:22,960
restrict the flow coming from the

41
00:01:26,630 --> 00:01:25,280
radiator and by doing that that would

42
00:01:29,429 --> 00:01:26,640
that would help to bring the temperature

43
00:01:31,030 --> 00:01:29,439
in the in the loop a little warmer and

44
00:01:33,030 --> 00:01:31,040
hopefully to the point that we can start

45
00:01:35,429 --> 00:01:33,040
to reintegrate it back into the to the

46
00:01:37,270 --> 00:01:35,439
bigger thermal control system and

47
00:01:38,710 --> 00:01:37,280
control control some of these loads of

48
00:01:40,390 --> 00:01:38,720
the heat loads

49
00:01:42,630 --> 00:01:40,400
inside the station

50
00:01:44,789 --> 00:01:42,640
um we've uh we've been focusing on that

51
00:01:45,910 --> 00:01:44,799
for the last couple of days um i think

52
00:01:48,630 --> 00:01:45,920
uh

53
00:01:50,469 --> 00:01:48,640
we're taking a valve that that and using

54
00:01:52,710 --> 00:01:50,479
it for a different purpose than what we

55
00:01:55,270 --> 00:01:52,720
originally intended so we didn't have a

56
00:01:56,709 --> 00:01:55,280
a controller in place to go in and and

57
00:01:58,630 --> 00:01:56,719
basically control this valve at the

58
00:01:59,429 --> 00:01:58,640
small increments

59
00:02:02,469 --> 00:01:59,439
that

60
00:02:03,990 --> 00:02:02,479
for

61
00:02:05,350 --> 00:02:04,000
we've been working with the vendor the

62
00:02:06,870 --> 00:02:05,360
hardware vendor for this particular

63
00:02:08,630 --> 00:02:06,880

valve and they say absolutely it could

64
00:02:09,749 --> 00:02:08,640
be controlled in the manner that you

65
00:02:11,110 --> 00:02:09,759
want

66
00:02:12,869 --> 00:02:11,120
so what we've been doing for the last

67
00:02:14,869 --> 00:02:12,879
couple of days is trying to put the

68
00:02:16,630 --> 00:02:14,879
right systems in place software on the

69
00:02:18,710 --> 00:02:16,640
ground commanding capabilities if you

70
00:02:19,990 --> 00:02:18,720
will to try to allow us to be able to to

71
00:02:22,630 --> 00:02:20,000
control that valve in a manner that

72
00:02:23,589 --> 00:02:22,640
allows us to to stop it where we want to

73
00:02:25,350 --> 00:02:23,599
stop it

74
00:02:27,750 --> 00:02:25,360
and so

75
00:02:29,910 --> 00:02:27,760
as of this morning the team is is

76
00:02:31,830 --> 00:02:29,920
continuing that effort

77
00:02:33,190 --> 00:02:31,840
it seems like as we as we move along and

78
00:02:34,470 --> 00:02:33,200
learn more about this valve and the way

79
00:02:35,910 --> 00:02:34,480
to command it

80
00:02:37,750 --> 00:02:35,920
it's clear that we have to operate in

81
00:02:40,309 --> 00:02:37,760
very small increments on the order of

82
00:02:42,150 --> 00:02:40,319
100 milliseconds and and putting the

83
00:02:44,790 --> 00:02:42,160
capability in the control center here to

84
00:02:45,750 --> 00:02:44,800
allow us to do that has uh has been has

85
00:02:47,589 --> 00:02:45,760
been a

86
00:02:48,470 --> 00:02:47,599
quite an effort over the last two days

87
00:02:49,990 --> 00:02:48,480
and so

88
00:02:52,550 --> 00:02:50,000

this morning the team is going through

89
00:02:54,229 --> 00:02:52,560
that effort um to uh to command this

90
00:02:57,110 --> 00:02:54,239
valve and do it in its in small

91
00:02:59,110 --> 00:02:57,120
increments and so um that's uh i mean

92
00:03:00,550 --> 00:02:59,120
we're it's kind of a

93
00:03:01,830 --> 00:03:00,560
turn the valve watch it for a little bit

94
00:03:04,309 --> 00:03:01,840
see what the temperatures do see what

95
00:03:06,550 --> 00:03:04,319
the flow rates do and we're having some

96
00:03:07,670 --> 00:03:06,560
success with regard to characterizing

97
00:03:10,229 --> 00:03:07,680
the system

98
00:03:12,309 --> 00:03:10,239
using this particular method

99
00:03:13,990 --> 00:03:12,319
whether or not it will be enough to

100
00:03:16,309 --> 00:03:14,000
allow us to

101
00:03:17,670 --> 00:03:16,319
put heat loads back onto the system from

102
00:03:19,190 --> 00:03:17,680
other parts of the loop but we can't

103
00:03:20,390 --> 00:03:19,200
tell yet

104
00:03:23,270 --> 00:03:20,400
given that

105
00:03:25,110 --> 00:03:23,280
kind of developing a new philosophy for

106
00:03:27,750 --> 00:03:25,120
how to manage the loop using this this

107
00:03:29,190 --> 00:03:27,760
valve um along with some other parts of

108
00:03:31,350 --> 00:03:29,200
the system i would say it's still very

109
00:03:33,270 --> 00:03:31,360
much in work and and whether or not we

110
00:03:35,750 --> 00:03:33,280
can pull it off i would uh

111
00:03:37,670 --> 00:03:35,760
i would i would hazard to to give you

112
00:03:39,750 --> 00:03:37,680
any kind of percentage at this point but

113
00:03:42,229 --> 00:03:39,760

the team is working very hard to

114
00:03:43,990 --> 00:03:42,239
to do that and and again having some

115
00:03:45,430 --> 00:03:44,000
degree of success this morning and

116
00:03:47,030 --> 00:03:45,440
trying to at least

117
00:03:49,190 --> 00:03:47,040
characterize the system a little better

118
00:03:50,710 --> 00:03:49,200
with this particular valve so so we're

119
00:03:53,110 --> 00:03:50,720
pretty excited about that we'll see how

120
00:03:55,750 --> 00:03:53,120
things go go the rest of the day okay

121
00:03:57,670 --> 00:03:55,760
and just for a quick snapshot right so

122
00:03:59,030 --> 00:03:57,680
where what condition is the loop in

123
00:04:00,710 --> 00:03:59,040
right now like what kind of loads are

124
00:04:03,429 --> 00:04:00,720
you guys actually placing on and what

125
00:04:05,750 --> 00:04:03,439
systems are on a different lube shutdown

126
00:04:07,110 --> 00:04:05,760
sure uh relative to this loop we call it

127
00:04:10,149 --> 00:04:07,120
loop a

128
00:04:11,910 --> 00:04:10,159
there are some external loads we have

129
00:04:14,550 --> 00:04:11,920
some what we call a main bus switching

130
00:04:16,390 --> 00:04:14,560
unit that's external to the station

131
00:04:18,150 --> 00:04:16,400
that has to be heated there's some cold

132
00:04:20,310 --> 00:04:18,160
plates out there with it that have

133
00:04:22,550 --> 00:04:20,320
ammonia running through them but it's

134
00:04:24,150 --> 00:04:22,560
it's all just external equipment that's

135
00:04:25,749 --> 00:04:24,160
being being

136
00:04:27,350 --> 00:04:25,759
right now cooled or

137
00:04:28,870 --> 00:04:27,360
warmed through this particular part of

138
00:04:30,230 --> 00:04:28,880

the ammonia loop

139
00:04:32,310 --> 00:04:30,240
at some point whenever we can

140
00:04:33,590 --> 00:04:32,320
characterize this this operation this

141
00:04:36,469 --> 00:04:33,600
particular loop a little bit better with

142
00:04:38,310 --> 00:04:36,479
this with this new uh valve

143
00:04:40,469 --> 00:04:38,320
modulation philosophy that we're trying

144
00:04:41,990 --> 00:04:40,479
to use then then we can get into the

145
00:04:43,909 --> 00:04:42,000
point where we can talk about

146
00:04:45,110 --> 00:04:43,919
introducing that ammonia into the heat

147
00:04:47,830 --> 00:04:45,120
exchanger

148
00:04:49,270 --> 00:04:47,840
at the node 2 or on the u.s lab and

149
00:04:51,030 --> 00:04:49,280
start trying to draw some of the heat

150
00:04:52,070 --> 00:04:51,040
loads off the station so we're not quite

151
00:04:54,550 --> 00:04:52,080
there yet

152
00:04:57,350 --> 00:04:54,560
and and so at this point we're still

153
00:04:58,870 --> 00:04:57,360
basically from a loop a standpoint at

154
00:05:00,070 --> 00:04:58,880
the same place we were last week in

155
00:05:01,990 --> 00:05:00,080
terms of the

156
00:05:04,310 --> 00:05:02,000
what what the ammonia is actually

157
00:05:06,469 --> 00:05:04,320
touching at this point okay so and so

158
00:05:08,390 --> 00:05:06,479
the team's continuing to work on this

159
00:05:10,070 --> 00:05:08,400
you know very creative inventive fix to

160
00:05:11,990 --> 00:05:10,080
try and get the loop you know in a month

161
00:05:13,990 --> 00:05:12,000
much more functional level would that be

162
00:05:15,670 --> 00:05:14,000
a permanent fix or what is spacewalk i

163
00:05:17,670 --> 00:05:15,680

know the spacewalk the astronauts are

164
00:05:19,110 --> 00:05:17,680
preparing for it this week but we don't

165
00:05:21,189 --> 00:05:19,120
know for sure yet if that's going to

166
00:05:23,510 --> 00:05:21,199
happen would a spacewalk still be

167
00:05:24,950 --> 00:05:23,520
necessary to bring this back up to kind

168
00:05:27,830 --> 00:05:24,960
of like its full

169
00:05:30,629 --> 00:05:27,840
you know 100 functionality

170
00:05:33,110 --> 00:05:30,639
well you know it whenever we whenever we

171
00:05:34,950 --> 00:05:33,120
figure out just how hard this

172
00:05:36,230 --> 00:05:34,960
we might we call it limping along

173
00:05:38,390 --> 00:05:36,240
sometimes you can figure out a way to

174
00:05:39,670 --> 00:05:38,400
limp along for two months four months

175
00:05:40,950 --> 00:05:39,680
six months and a lot of that's going to

176
00:05:43,189 --> 00:05:40,960
be driven by

177
00:05:45,749 --> 00:05:43,199
how operationally complex it is to try

178
00:05:48,629 --> 00:05:45,759
to to live with a particular issue

179
00:05:50,550 --> 00:05:48,639
and until we understand exactly you know

180
00:05:52,230 --> 00:05:50,560
how this system gets characterized and

181
00:05:55,189 --> 00:05:52,240
what it means to try to operate with the

182
00:05:57,670 --> 00:05:55,199
limits that we'll have to operate within

183
00:05:59,749 --> 00:05:57,680
given given this particular valve and

184
00:06:01,670 --> 00:05:59,759
any other other options that are

185
00:06:03,189 --> 00:06:01,680
available to us we may or may not be

186
00:06:04,550 --> 00:06:03,199
able to do that for an extended period

187
00:06:06,550 --> 00:06:04,560
of time

188
00:06:07,990 --> 00:06:06,560

if we can't do it for you know the

189
00:06:09,590 --> 00:06:08,000
foreseeable future for an extended

190
00:06:12,230 --> 00:06:09,600
period of time then then obviously we

191
00:06:14,070 --> 00:06:12,240
got to look at other options but but

192
00:06:15,749 --> 00:06:14,080
clearly at some point in the future

193
00:06:18,390 --> 00:06:15,759
we're going to want to go

194
00:06:21,189 --> 00:06:18,400
get the system back to its it's nominal

195
00:06:23,350 --> 00:06:21,199
uh you know uh situation with the pump

196
00:06:24,950 --> 00:06:23,360
module and and so uh that's

197
00:06:27,110 --> 00:06:24,960
it's just a matter of timing and when we

198
00:06:29,110 --> 00:06:27,120
do that so i i hope that that would be

199
00:06:31,590 --> 00:06:29,120
our clear path at some point to do that

200
00:06:33,110 --> 00:06:31,600
okay well again kenny todd ops

201
00:06:34,710 --> 00:06:33,120
integration manager for the station

202
00:06:36,629 --> 00:06:34,720
teams continuing to work here in mission

203
00:06:38,550 --> 00:06:36,639
control to try and get that loop

204
00:06:40,710 --> 00:06:38,560
back up to where it was uh before the

205
00:06:42,230 --> 00:06:40,720
issue cropped up last week uh kenny

206
00:06:43,189 --> 00:06:42,240
thanks for giving us a quick update

207
00:06:44,870 --> 00:06:43,199
really appreciate it we're going to