



Using the Bathroom in SPACE



1
00:00:00,500 --> 00:00:01,101
>> BY FAR,

2
00:00:01,101 --> 00:00:01,968
THE MOST COMMON QUESTION

3
00:00:01,968 --> 00:00:02,702
WE GET ASKED

4
00:00:02,702 --> 00:00:03,837
AS ASTRONAUTS IS...

5
00:00:06,539 --> 00:00:08,975
SO, LET'S TAKE A, UH,

6
00:00:08,975 --> 00:00:10,910
A PEEK AT THE PROCESS.

7
00:00:15,682 --> 00:00:16,683
THIS COMPARTMENT

8
00:00:16,683 --> 00:00:17,951
IS CALLED THE W.H.C.,

9
00:00:17,951 --> 00:00:19,719
THE NASA ACRONYM FOR

10
00:00:19,719 --> 00:00:21,888
"WASTE AND HYGIENE COMPARTMENT,"

11
00:00:21,888 --> 00:00:23,323
I THINK.

12
00:00:23,323 --> 00:00:24,858
WE JUST KNOW IT AS W.H.C.

13
00:00:24,858 --> 00:00:28,027

IT'S INSIDE THIS, UH, THIS--

14

00:00:28,027 --> 00:00:29,662

WE CALL THIS A STALL,

15

00:00:29,662 --> 00:00:33,600

WHICH IS A, UH,

16

00:00:33,600 --> 00:00:36,035

A COUPLE OF WALLS AND A DOOR

17

00:00:36,035 --> 00:00:37,804

TO GIVE YOU SOME PRIVACY,

18

00:00:37,804 --> 00:00:38,605

BECAUSE YOU'RE RIGHT

19

00:00:38,605 --> 00:00:40,140

IN THE MIDDLE OF NODE THREE

20

00:00:40,140 --> 00:00:41,441

WITH A TREADMILL

21

00:00:41,441 --> 00:00:43,476

ON ONE SIDE OF THE TOILET,

22

00:00:43,476 --> 00:00:45,278

THE WEIGHT MACHINE

23

00:00:45,278 --> 00:00:46,112

WE CALL A.R.E.D.

24

00:00:46,112 --> 00:00:47,714

ON THE OTHER SIDE,

25

00:00:47,714 --> 00:00:48,782

AND DOWN IN THE FLOOR,

26

00:00:48,782 --> 00:00:49,816

OUR AWESOME WINDOW

27

00:00:49,816 --> 00:00:51,684

CALLED THE CUPOLA.

28

00:00:51,684 --> 00:00:53,019

AND THIS IS A HIGH-TRAFFIC AREA,

29

00:00:53,019 --> 00:00:54,053

PEOPLE ARE COMING AND GOING,

30

00:00:54,053 --> 00:00:57,090

UH, SO YOU NEED THE PRIVACY.

31

00:00:57,090 --> 00:01:00,260

FIRST OF ALL, THE DESIRE TO GO,

32

00:01:00,260 --> 00:01:01,694

THE NEED TO GO-TO GO

33

00:01:01,694 --> 00:01:03,763

IS VERY SIMILAR AS ON EARTH,

34

00:01:03,763 --> 00:01:04,597

WHERE YOU JUST KNOW

35

00:01:04,597 --> 00:01:05,365

YOU HAVE TO GO.

36

00:01:05,365 --> 00:01:06,566

IT DOESN'T FEEL ANY DIFFERENT

37

00:01:06,566 --> 00:01:08,201

BECAUSE THE FLUID MIGHT BE

38

00:01:08,201 --> 00:01:09,335

FLOATING IN YOUR BLADDER

39

00:01:09,335 --> 00:01:10,370
OR SOMETHING-- N-NO.

40

00:01:10,370 --> 00:01:11,538
THAT'S-- IT-IT'S

41

00:01:11,538 --> 00:01:12,605
JUST THE EXACT SAME,

42

00:01:12,605 --> 00:01:14,274
UH, SENSATION.

43

00:01:14,274 --> 00:01:15,708
YOU KNOW YOU GOTTA GO.

44

00:01:15,708 --> 00:01:16,409
EITHER ONE.

45

00:01:16,409 --> 00:01:17,877
NUMBER ONE OR NUMBER TWO.

46

00:01:17,877 --> 00:01:18,778
SO YOU'VE ALREADY--

47

00:01:18,778 --> 00:01:20,146
YOU'VE DECIDED THAT.

48

00:01:20,146 --> 00:01:21,714
YOU FLOAT INTO THE W.H.C.

49

00:01:29,155 --> 00:01:32,625
AND WE HAVE THE TOILET...

50

00:01:32,625 --> 00:01:33,626
[CHOIR SINGING]

51

00:01:33,626 --> 00:01:36,696

[FLUSHING]

52

00:01:36,696 --> 00:01:39,432

WHICH CONSISTS OF A SEAT,

53

00:01:39,432 --> 00:01:40,900

AND A METAL BUCKET

54

00:01:40,900 --> 00:01:42,836

THAT WE CALL [INDISTINCT]

55

00:01:42,836 --> 00:01:44,571

WHICH IS A RUSSIAN ACRONYM

56

00:01:44,571 --> 00:01:46,206

FOR SOMETHING.

57

00:01:46,206 --> 00:01:48,107

CONTAINER OF SOMETHING.

58

00:01:48,107 --> 00:01:50,710

AND, UM, BUT IT-IT HOLDS ABOUT--

59

00:01:50,710 --> 00:01:51,244

DEPENDING ON

60

00:01:51,244 --> 00:01:52,612

HOW MANY PEOPLE ARE HERE,

61

00:01:52,612 --> 00:01:54,714

IT HOLDS ABOUT, UM,

62

00:01:54,714 --> 00:01:56,916

MAYBE 30 DEPOSITS.

63

00:01:56,916 --> 00:01:57,817

[CHA-CHING]

64

00:01:57,817 --> 00:01:58,818
AND WE'LL, UH, WE'LL

65

00:01:58,818 --> 00:02:00,553
TALK ABOUT THAT IN A SECOND.

66

00:02:00,553 --> 00:02:01,721
THE URINE GOES

67

00:02:01,721 --> 00:02:04,757
INTO THIS HOSE RIGHT HERE,

68

00:02:04,757 --> 00:02:06,993
AND THIS VALVE

69

00:02:06,993 --> 00:02:08,294
IS WHAT ACTIVATES

70

00:02:08,294 --> 00:02:09,863
THE WHOLE SYSTEM.

71

00:02:09,863 --> 00:02:10,730
OKAY, TH-THese ARE

72

00:02:10,730 --> 00:02:12,265
THE TWO PRIMARY CONTROL PANELS

73

00:02:12,265 --> 00:02:13,900
FOR THE W.H.C.

74

00:02:13,900 --> 00:02:15,468
WHEN THE SYSTEM IS

75

00:02:15,468 --> 00:02:18,271
READY FOR USE, IT'S A "V."

76

00:02:18,271 --> 00:02:19,873

THIS MEANS IT'S

77

00:02:19,873 --> 00:02:21,841

GOING TO THE U.P.A.

78

00:02:21,841 --> 00:02:24,344

SO WE SAY "CHECK THAT

79

00:02:24,344 --> 00:02:26,012

IT'S V-TO-P."

80

00:02:26,012 --> 00:02:27,013

ALL RIGHT,

81

00:02:27,013 --> 00:02:27,814

NOW WE'RE ON THE INSIDE

82

00:02:27,814 --> 00:02:30,483

OF THE HYGIENE COMPARTMENT.

83

00:02:30,483 --> 00:02:31,951

CLOSE THE DOOR,

84

00:02:31,951 --> 00:02:34,554

SO THAT YOU HAVE YOUR PRIVACY.

85

00:02:34,554 --> 00:02:36,155

YOU TAKE THE FUNNEL.

86

00:02:36,155 --> 00:02:37,090

THIS KNOB RIGHT HERE

87

00:02:37,090 --> 00:02:38,291

ACTIVATES THE WHOLE SYSTEM.

88

00:02:38,291 --> 00:02:39,726

IT'S VERY, VERY,

89

00:02:39,726 --> 00:02:40,627

UH, CONVENIENT,

90

00:02:40,627 --> 00:02:42,161

BECAUSE IT'S JUST ONE VALVE

91

00:02:42,161 --> 00:02:43,496

OPERATES IT ALL.

92

00:02:43,496 --> 00:02:45,265

BUT SHOULD THE-- IN THE EVENT

93

00:02:45,265 --> 00:02:47,400

THAT YOU, UH, FORGET

94

00:02:47,400 --> 00:02:48,568

HOW THE SYSTEM OPERATES,

95

00:02:48,568 --> 00:02:49,802

OR YOU'RE BRAND NEW HERE,

96

00:02:49,802 --> 00:02:50,570

AND YOU JUST WANNA

97

00:02:50,570 --> 00:02:51,571

DOUBLE-CHECK,

98

00:02:51,571 --> 00:02:52,872

IN GOOD NASA FASHION,

99

00:02:52,872 --> 00:02:53,940

WE HAVE A CHECKLIST.

100

00:02:53,940 --> 00:02:54,874

[DING]

101
00:02:54,874 --> 00:02:55,775
THIS IS CALLED,

102
00:02:55,775 --> 00:02:58,144
UH, PROCEDURE 2.301.

103
00:02:58,144 --> 00:03:00,113
THE NO-- W.H.C.

104
00:03:00,113 --> 00:03:01,548
NOMINAL OPERATIONS CUE CARD,

105
00:03:01,548 --> 00:03:02,649
AND IT'S GOT SEVERAL BLOCKS

106
00:03:02,649 --> 00:03:04,450
FOR OPERATIONS.

107
00:03:04,450 --> 00:03:05,885
SO THERE'S TWO DIFFERENT WAYS

108
00:03:05,885 --> 00:03:08,054
THE-- WHERE THE PEE CAN GO.

109
00:03:08,054 --> 00:03:09,222
IT CAN JUST GO INTO A BUCKET,

110
00:03:09,222 --> 00:03:10,857
WHICH IS CALLED A [INDISTINCT]

111
00:03:10,857 --> 00:03:12,125
AND, UH, ESSENTIALLY

112
00:03:12,125 --> 00:03:13,359
YOU'RE JUST F-- PEEING

113
00:03:13,359 --> 00:03:14,627

UNTIL THAT BUCKET'S FILLED UP,

114

00:03:14,627 --> 00:03:15,161

AND THEN YOU HAVE

115

00:03:15,161 --> 00:03:16,396

TO SWAP OUT THE BUCKET.

116

00:03:16,396 --> 00:03:18,598

OR YOU CAN CONFIGURE

117

00:03:18,598 --> 00:03:20,300

W.H.C. TO U.P.A.,

118

00:03:20,300 --> 00:03:22,569

UH, URINE PROCESSOR ASSEMBLY,

119

00:03:22,569 --> 00:03:23,970

AND, UH, AND THAT WAY,

120

00:03:23,970 --> 00:03:25,171

THE URINE IS GOING RIGHT IN--

121

00:03:25,171 --> 00:03:26,406

DIRECTLY INTO THE SYSTEM,

122

00:03:26,406 --> 00:03:27,106

AND THAT'S THE WAY

123

00:03:27,106 --> 00:03:28,508

WE NORMALLY KEEP IT, UH,

124

00:03:28,508 --> 00:03:29,442

AS MOST CONVENIENT

125

00:03:29,442 --> 00:03:30,310

FOR THE CREW MEMBERS,

126
00:03:30,310 --> 00:03:31,144
'CAUSE YOU'RE NOT CONSTANTLY

127
00:03:31,144 --> 00:03:32,579
CHANGING OUT A TANK.

128
00:03:32,579 --> 00:03:33,846
SO THERE'S COUPLE BLOCKS

129
00:03:33,846 --> 00:03:34,814
THAT TELL YOU HOW TO MAKE

130
00:03:34,814 --> 00:03:36,482
THOSE-- THO-THOSE CHANGES,

131
00:03:36,482 --> 00:03:38,618
AND, UH, AND SOME

132
00:03:38,618 --> 00:03:39,719
DETAILED STEPS,

133
00:03:39,719 --> 00:03:40,920
IF YOU NEED TO KNOW

134
00:03:40,920 --> 00:03:43,156
HOW EXACTLY TO DO IT.

135
00:03:43,156 --> 00:03:45,892
AND IN CASE THINGS GO WRONG--

136
00:03:45,892 --> 00:03:46,659
LIKE THE HARDWARE,

137
00:03:46,659 --> 00:03:47,894
NOT YOURSELF--

138
00:03:47,894 --> 00:03:49,462

THERE'S THE W.H.C.

139

00:03:49,462 --> 00:03:50,797
MALFUNCTIONS CUE CARD.

140

00:03:50,797 --> 00:03:52,732
AND WE THOUGHT-

141

00:03:52,732 --> 00:03:53,533
THOUGHT OF ALL THE DIFFERENT,

142

00:03:53,533 --> 00:03:54,400
LIKE, COMBINATIONS

143

00:03:54,400 --> 00:03:55,468
IN THE FAILURE MODES,

144

00:03:55,468 --> 00:03:57,971
AND-AND, UH, AT THE BOTTOM LINE

145

00:03:57,971 --> 00:03:59,339
IS THAT IF THERE'S A RED LIGHT,

146

00:03:59,339 --> 00:04:00,473
WE TALK TO THE GROUND,

147

00:04:00,473 --> 00:04:03,076
AND TOGETHER, WE-WE FIGURE OUT

148

00:04:03,076 --> 00:04:04,811
THE PATH FORWARD.

149

00:04:04,811 --> 00:04:06,579
OKAY, BACK TO NORMAL OPERATIONS.

150

00:04:06,579 --> 00:04:08,281
TIME TO GO.

151
00:04:08,281 --> 00:04:09,882
YOU TAKE THE VALVE,

152
00:04:09,882 --> 00:04:11,884
AND, UH...

153
00:04:11,884 --> 00:04:14,220
[MACHINE WHIRRING]

154
00:04:14,220 --> 00:04:15,855
YOU TURN IT ON.

155
00:04:15,855 --> 00:04:18,591
YOU HEAR THE FAN NOISE,

156
00:04:18,591 --> 00:04:21,194
CHECK FOR AIR FLOW,

157
00:04:21,194 --> 00:04:23,062
I'LL SHOW YOU THAT THERE IS,

158
00:04:23,062 --> 00:04:25,064
IN FACT, AIR FLOW.

159
00:04:31,537 --> 00:04:32,872
SO, LITTLE BIT OF AIR FLOW,

160
00:04:32,872 --> 00:04:34,307
AND THAT HELPS EVERYTHING

161
00:04:34,307 --> 00:04:37,343
FLOW IN THE RIGHT DIRECTION.

162
00:04:37,343 --> 00:04:40,380
WE'VE GOT OUR, UH, SIMULATOR.

163
00:04:43,316 --> 00:04:44,283

AND...

164

00:04:51,224 --> 00:04:52,558

THAT'S WHERE YOUR BUSINESS GOES.

165

00:04:59,298 --> 00:05:00,333

YOU COMPLETE.

166

00:05:00,333 --> 00:05:01,467

YOU WANNA BE A GOOD CREW MEMBER,

167

00:05:01,467 --> 00:05:02,135

SO YOU MAKE SURE

168

00:05:02,135 --> 00:05:04,504

THAT YOU WIPE OFF

169

00:05:04,504 --> 00:05:07,407

THE EXCESS.

170

00:05:07,407 --> 00:05:09,342

USE A DISINFECTANT WIPE

171

00:05:09,342 --> 00:05:12,178

OCCASIONALLY OR OFTEN.

172

00:05:12,178 --> 00:05:14,881

AND THEN YOU SIMPLY

173

00:05:14,881 --> 00:05:17,517

TURN THE VALVE OFF.

174

00:05:17,517 --> 00:05:18,618

BUT I WANNA SHOW YOU

175

00:05:18,618 --> 00:05:20,119

NUMBER TWO AS WELL,

176

00:05:20,119 --> 00:05:21,320

SO I'LL LEAVE IT RUNNING,

177

00:05:21,320 --> 00:05:23,589

AND WE'LL ROLL RIGHT INTO THAT.

178

00:05:23,589 --> 00:05:26,159

OKAY, WHEN IT IS TIME TO GO,

179

00:05:26,159 --> 00:05:27,593

YOU FLIP THIS LEVER HERE,

180

00:05:27,593 --> 00:05:30,296

AND THAT LIFTS UP THE LID.

181

00:05:30,296 --> 00:05:31,931

THE SEAT HERE IS ABOUT,

182

00:05:31,931 --> 00:05:34,133

OH, 5 OR 6 INCHES

183

00:05:34,133 --> 00:05:36,102

IN DIAMETER,

184

00:05:36,102 --> 00:05:37,336

AND THERE'S, UH,

185

00:05:37,336 --> 00:05:40,273

A PLASTIC LINER IN THERE,

186

00:05:40,273 --> 00:05:43,109

WHICH-- WHERE YOUR

187

00:05:43,109 --> 00:05:45,244

DEPOSIT GOES.

188

00:05:45,244 --> 00:05:46,713

WHAT I HAVE HERE

189

00:05:46,713 --> 00:05:48,548

IS GREEN BEANS AND MUSHROOMS,

190

00:05:48,548 --> 00:05:50,116

AND I DO NOT LIKE MUSHROOMS,

191

00:05:50,116 --> 00:05:52,685

SO I DON'T MIND CONTRIBUTING

192

00:05:52,685 --> 00:05:55,188

THIS PIECE OF, UH, FOOD

193

00:05:55,188 --> 00:05:57,523

IN THE NAME OF EDUCATION.

194

00:05:57,523 --> 00:06:00,626

SO PRETEND I ATE THIS YESTERDAY,

195

00:06:00,626 --> 00:06:04,797

AND NOW IT GOES INTO THERE.

196

00:06:04,797 --> 00:06:06,866

YOU CLEAN YOURSELF,

197

00:06:06,866 --> 00:06:08,968

AND THE WIPES GO

198

00:06:08,968 --> 00:06:10,837

INTO THERE AS WELL.

199

00:06:10,837 --> 00:06:12,638

YOU TAKE THIS RED TAB,

200

00:06:12,638 --> 00:06:14,841

YOU PULL IT OFF THE RIM,

201
00:06:14,841 --> 00:06:16,476
AND IT DEPENDS ON HOW FULL

202
00:06:16,476 --> 00:06:17,577
THE CONTAINER IS.

203
00:06:17,577 --> 00:06:18,344
THIS ONE'S ABOUT

204
00:06:18,344 --> 00:06:19,278
HALFWAY THROUGH.

205
00:06:19,278 --> 00:06:21,247
WE DO HAVE, UH, A STICK,

206
00:06:21,247 --> 00:06:24,383
AND YOU PUSH IT DOWN IN THERE

207
00:06:24,383 --> 00:06:26,486
WITH ALL ITS OTHER FRIENDS,

208
00:06:26,486 --> 00:06:27,320
AND THEN IT'S TIME

209
00:06:27,320 --> 00:06:28,721
TO PUT A NEW BAG ON.

210
00:06:28,721 --> 00:06:29,956
TO PUT A NEW BAG ON,

211
00:06:29,956 --> 00:06:31,557
YOU SEPARATE-- PULL THE--

212
00:06:31,557 --> 00:06:33,259
IT'S LIKE A HAIR SCRUNCHIE.

213
00:06:33,259 --> 00:06:34,894

GET IT ALL SO IT HAS

214

00:06:34,894 --> 00:06:36,729
MAX CAPACITY THERE,

215

00:06:36,729 --> 00:06:39,298
AND READY TO GO.

216

00:06:39,298 --> 00:06:42,535
CLOSE IT UP,

217

00:06:42,535 --> 00:06:44,403
CLOSE THE LID,

218

00:06:44,403 --> 00:06:45,838
NOW YOU'VE GONE NUMBER ONE,

219

00:06:45,838 --> 00:06:46,405
NUMBER TWO,

220

00:06:46,405 --> 00:06:47,673
YOU CLEANED YOURSELF UP,

221

00:06:47,673 --> 00:06:49,175
AND, UH, IT'S TIME

222

00:06:49,175 --> 00:06:50,777
TO TURN THE SYSTEM OFF.

223

00:06:50,777 --> 00:06:52,211
YOU JUST TAKE THIS VALVE.

224

00:06:52,211 --> 00:06:53,780
[STOPS WHIRRING]

225

00:06:53,780 --> 00:06:55,481
ROTATE IT TO "OFF."

226

00:06:55,481 --> 00:06:58,584

THE FAN SPINS DOWN,

227

00:06:58,584 --> 00:07:00,319

THE SYSTEM CHECKS ITSELF,

228

00:07:00,319 --> 00:07:01,554

ALL THE LIGHTS GO OUT,

229

00:07:01,554 --> 00:07:03,322

AND YOU'RE DONE.

230

00:07:03,322 --> 00:07:04,323

SO CONGRATULATIONS,

231

00:07:04,323 --> 00:07:06,159

YOU JUST USED THE W.H.C.

232

00:07:06,159 --> 00:07:07,093

FOR THE FIRST TIME,

233

00:07:07,093 --> 00:07:07,827

AND YOU, UH, LEARNED

234

00:07:07,827 --> 00:07:08,728

ABOUT THE PROCESS.

235

00:07:08,728 --> 00:07:09,862

HOPE IT'S EDUCATIONAL,

236

00:07:09,862 --> 00:07:10,563

BUT I DON'T THINK

237

00:07:10,563 --> 00:07:11,397

IT'S GONNA LESSEN

238

00:07:11,397 --> 00:07:12,665

THE AMOUNT OF TIMES

239

00:07:12,665 --> 00:07:13,399

I HAVE TO ANSWER

240

00:07:13,399 --> 00:07:14,534

THAT QUESTION.