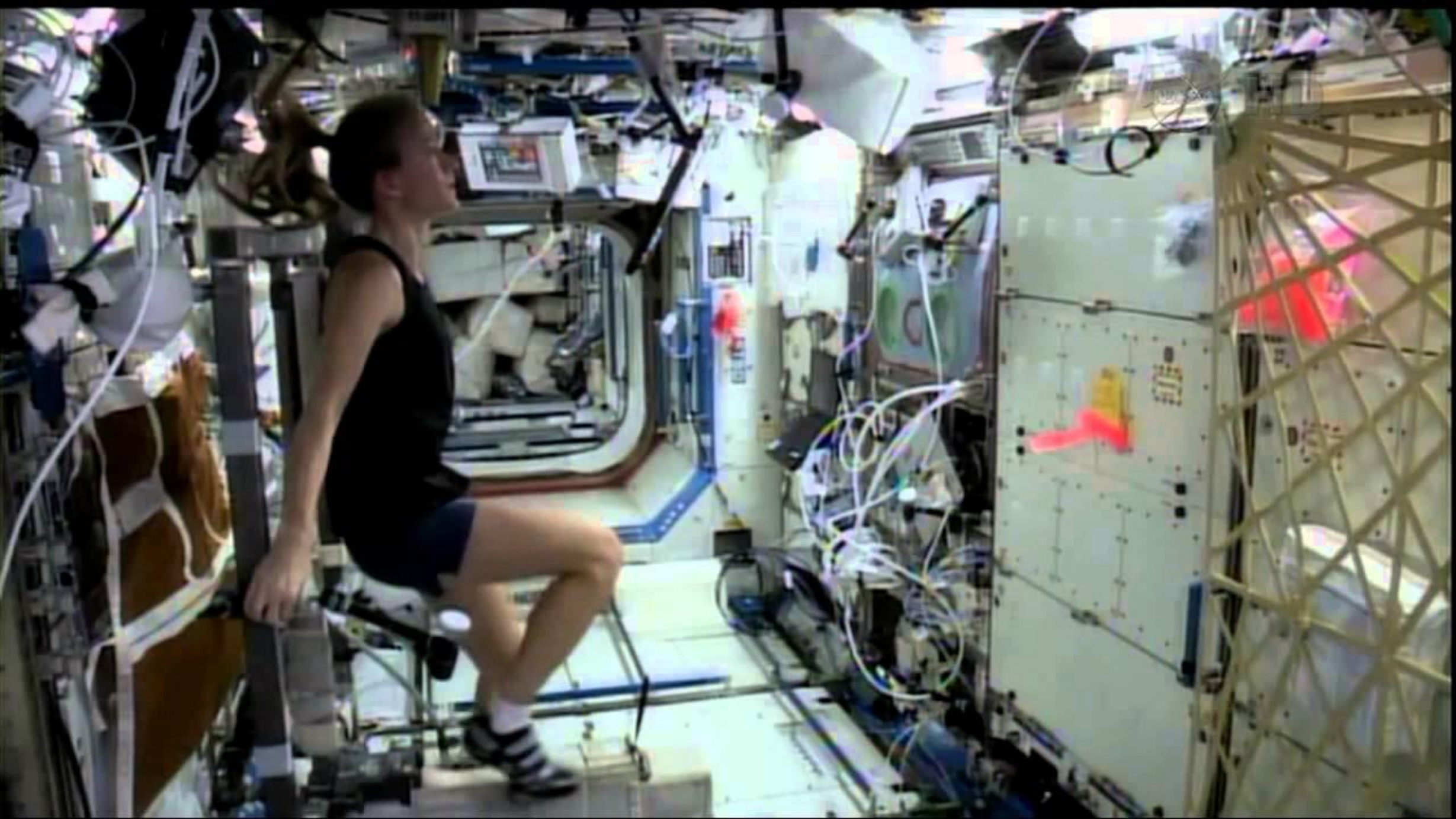

1
00:00:04,630 --> 00:00:03,030
well i've been working with eclis pretty

2
00:00:07,590 --> 00:00:04,640
much since the beginning of my career

3
00:00:10,470 --> 00:00:07,600
back in 1985.

4
00:00:11,990 --> 00:00:10,480
back then space station was in phase b

5
00:00:13,990 --> 00:00:12,000
and we were

6
00:00:16,230 --> 00:00:14,000
young engineers playing in the lab with

7
00:00:17,830 --> 00:00:16,240
the first life support systems trying to

8
00:00:20,710 --> 00:00:17,840
figure out what we could use what would

9
00:00:22,870 --> 00:00:20,720
work and so fast forward

10
00:00:25,029 --> 00:00:22,880
now we've got a working regenerative

11
00:00:26,950 --> 00:00:25,039
life support system on the space station

12
00:00:28,550 --> 00:00:26,960
it supports six crew

13
00:00:31,349 --> 00:00:28,560

it completely

14
00:00:33,350 --> 00:00:31,359
recycles the air and the water

15
00:00:34,389 --> 00:00:33,360
for the space station crew

16
00:00:36,549 --> 00:00:34,399
and

17
00:00:37,510 --> 00:00:36,559
we're working on how to further evolve

18
00:00:41,430 --> 00:00:37,520
that

19
00:00:43,030 --> 00:00:41,440
it beyond low earth orbit

20
00:00:45,830 --> 00:00:43,040
eclipses made up a lot of different

21
00:00:47,510 --> 00:00:45,840
functions we have to condition the air

22
00:00:50,150 --> 00:00:47,520
temperature and humidity control like

23
00:00:52,389 --> 00:00:50,160
your air conditioner

24
00:00:54,869 --> 00:00:52,399
like on earth we have plants to remove

25
00:00:56,709 --> 00:00:54,879
carbon dioxide and give us oxygen well

26
00:00:58,389 --> 00:00:56,719
we don't have that in a closed

27
00:00:59,590 --> 00:00:58,399
environment like space station so we

28
00:01:01,510 --> 00:00:59,600
rely on

29
00:01:03,750 --> 00:01:01,520
chemical equipment

30
00:01:05,509 --> 00:01:03,760
to essentially remove the carbon dioxide

31
00:01:08,149 --> 00:01:05,519
and then replace it with oxygen for the

32
00:01:10,550 --> 00:01:08,159
crew to breathe we remove contaminants

33
00:01:13,030 --> 00:01:10,560
from the air

34
00:01:15,670 --> 00:01:13,040
in the water area we have to

35
00:01:16,870 --> 00:01:15,680
manage all the cruise waste including

36
00:01:20,149 --> 00:01:16,880
urine

37
00:01:22,789 --> 00:01:20,159
and sweat humidity out of the air is

38
00:01:24,469 --> 00:01:22,799

removed and recycled and turned into

39
00:01:25,749 --> 00:01:24,479
clean drinking water

40
00:01:28,630 --> 00:01:25,759
and then we have to deal with solid

41
00:01:29,990 --> 00:01:28,640
waste as well so we do the potties we

42
00:01:32,230 --> 00:01:30,000
also have emergency equipment we're

43
00:01:33,590 --> 00:01:32,240
responsible for fire detection and

44
00:01:35,590 --> 00:01:33,600
suppression

45
00:01:36,710 --> 00:01:35,600
and then monitoring of the atmosphere

46
00:01:40,469 --> 00:01:36,720
and the water

47
00:01:42,789 --> 00:01:40,479
we use iodine to control the microbial

48
00:01:45,510 --> 00:01:42,799
population in the product water

49
00:01:47,590 --> 00:01:45,520
and we use a specially developed resin

50
00:01:49,830 --> 00:01:47,600
that imparts the iodine into the water

51
00:01:51,350 --> 00:01:49,840
it's released from this resin

52
00:01:53,030 --> 00:01:51,360
and

53
00:01:54,630 --> 00:01:53,040
that was licensed

54
00:01:56,709 --> 00:01:54,640
it was developed for use initially for

55
00:01:59,030 --> 00:01:56,719
shuttle and became part of our water

56
00:02:01,350 --> 00:01:59,040
processor and then that was sold to a

57
00:02:02,950 --> 00:02:01,360
company who has a commercial company who

58
00:02:04,550 --> 00:02:02,960
has turned it into

59
00:02:05,830 --> 00:02:04,560
ground-based filtration systems that

60
00:02:08,229 --> 00:02:05,840
they have taken

61
00:02:11,670 --> 00:02:08,239
across the globe for deployment in

62
00:02:13,990 --> 00:02:11,680
villages for disaster relief and all

63
00:02:16,710 --> 00:02:14,000

kinds of applications so that's been

64
00:02:18,390 --> 00:02:16,720
really neat to see that application

65
00:02:20,070 --> 00:02:18,400
we've got working system on space

66
00:02:21,670 --> 00:02:20,080
station we

67
00:02:24,309 --> 00:02:21,680
worked hard on that we definitely want

68
00:02:26,309 --> 00:02:24,319
to start there and evolve that into what

69
00:02:28,869 --> 00:02:26,319
we need for future missions but

70
00:02:30,869 --> 00:02:28,879
as we cut the umbilical

71
00:02:32,550 --> 00:02:30,879
from earth right now you know we have

72
00:02:34,710 --> 00:02:32,560
the ability to

73
00:02:36,710 --> 00:02:34,720
send supplies up

74
00:02:38,790 --> 00:02:36,720
if an emergency happens the crew can go

75
00:02:41,190 --> 00:02:38,800
home you know to back to earth we can

76
00:02:42,790 --> 00:02:41,200
send samples down

77
00:02:44,869 --> 00:02:42,800
we won't have that for future long

78
00:02:46,869 --> 00:02:44,879
duration missions they're on their own

79
00:02:48,150 --> 00:02:46,879
so we need our systems to be more

80
00:02:52,949 --> 00:02:48,160
reliable

81
00:02:55,030 --> 00:02:52,959
not break down and not have to carry

82
00:02:57,750 --> 00:02:55,040
a lot of spare parts

83
00:03:00,949 --> 00:02:57,760
and then also not to have to resupply

84
00:03:03,030 --> 00:03:00,959
oxygen and water so we need to actually

85
00:03:04,949 --> 00:03:03,040
have recycle more close the loop even

86
00:03:07,030 --> 00:03:04,959
more as we

87
00:03:08,790 --> 00:03:07,040
go further so we're looking at ways to

88
00:03:10,630 --> 00:03:08,800

do that with our starting with our

89
00:03:12,710 --> 00:03:10,640
existing systems and

90
00:03:15,270 --> 00:03:12,720
make them less complex therefore more

91
00:03:16,830 --> 00:03:15,280
reliable

92
00:03:19,910 --> 00:03:16,840
and more

93
00:03:22,790 --> 00:03:19,920
efficient um so we see a demonstration

94
00:03:25,270 --> 00:03:22,800
like that on the space station of

95
00:03:26,949 --> 00:03:25,280
that is our goal that is our goal by the

96
00:03:28,869 --> 00:03:26,959
end of the space station life we will

97
00:03:30,470 --> 00:03:28,879
have demonstrated

98
00:03:32,470 --> 00:03:30,480
the mars eclipse

99
00:03:35,509 --> 00:03:32,480
you know on station the system that we

100
00:03:37,030 --> 00:03:35,519
want to take for for the future and the