



1  
00:00:00,000 --> 00:00:09,137  
Music full then under

2  
00:00:09,172 --> 00:00:15,664  
VO. From technology

3  
00:00:15,699 --> 00:00:17,360  
development to to science missions

4  
00:00:17,395 --> 00:00:18,529  
to major flight systems

5  
00:00:18,564 --> 00:00:20,593  
programs. Marshall's

6  
00:00:20,628 --> 00:00:22,223  
propulsion research and development

7  
00:00:22,258 --> 00:00:25,071  
also supports the U.S. commercial sector

8  
00:00:25,106 --> 00:00:27,488  
and have supported NASA's Commercial

9  
00:00:27,523 --> 00:00:29,905  
Crew and Commercial Cargo programs.

10  
00:00:29,940 --> 00:00:31,969  
Marshall's participation in development

11  
00:00:32,004 --> 00:00:34,320  
efforts such as Shuttle and the Inertial

12  
00:00:34,355 --> 00:00:36,897  
Upper Stage or IUS has provided space

13  
00:00:36,932 --> 00:00:40,065

access capabilities to DoD, as well

14

00:00:40,100 --> 00:00:43,120

as the civil space sector. An important

15

00:00:43,155 --> 00:00:44,912

part of Marshall's involvement in the

16

00:00:44,947 --> 00:00:47,936

International Space Station or ISS,

17

00:00:47,971 --> 00:00:49,808

is the development of the Environment

18

00:00:49,843 --> 00:00:53,233

Control and Life Support System-ECLSS.

19

00:00:53,268 --> 00:00:55,169

This equipment recycles air and

20

00:00:55,204 --> 00:00:56,289

wastewater in space,

21

00:00:56,324 --> 00:00:57,857

providing life support

22

00:00:57,892 --> 00:01:00,704

for astronauts onboard the ISS.

23

00:01:00,739 --> 00:01:03,344

ECLSS recycles crew member urine and

24

00:01:03,379 --> 00:01:05,488

wastewater to reuse as clean water.

25

00:01:05,523 --> 00:01:09,153

ECLSS also takes some of the recovered

26

00:01:09,188 --> 00:01:11,250

water for electrolysis, breaking apart

27

00:01:11,285 --> 00:01:14,321

molecules to retrieve oxygen. Marshall

28

00:01:14,356 --> 00:01:16,400

pioneered a process of ECLSS water

29

00:01:16,435 --> 00:01:18,880

recycling tests utilizing actual human

30

00:01:18,915 --> 00:01:21,584

derived wastewaters collected from test

31

00:01:21,619 --> 00:01:24,977

subject volunteers. this water recycling

32

00:01:25,012 --> 00:01:27,825

technology was developed in the 80's

33

00:01:27,860 --> 00:01:29,761

and 90's we competed

34

00:01:29,796 --> 00:01:30,928

several technologies

35

00:01:30,963 --> 00:01:32,321

against one another and the one we

36

00:01:32,356 --> 00:01:33,680

selected was mostly

37

00:01:33,715 --> 00:01:35,616

for Microgravity use.

38

00:01:35,651 --> 00:01:37,888

Other system tests focused on

39

00:01:37,923 --> 00:01:38,720

understanding the

40

00:01:38,755 --> 00:01:40,304

individual and collective

41

00:01:40,339 --> 00:01:41,937

performance of equipment designed to

42

00:01:41,972 --> 00:01:43,633

continuously revitalize

43

00:01:43,668 --> 00:01:46,576

the ISS cabin atmosphere.

44

00:01:46,611 --> 00:01:49,393

Various module simulators are available

45

00:01:49,428 --> 00:01:51,984

in Marshall's ECLSS Test Facility; the

46

00:01:52,019 --> 00:01:53,552

Laboratory Module

47

00:01:53,587 --> 00:01:55,824

Simulator (LMS), the Node

48

00:01:55,859 --> 00:01:57,232

1 Simulator and the

49

00:01:57,267 --> 00:01:59,201

Regenerative ECLSS Module

50

00:01:59,236 --> 00:02:00,833

Simulator (REMS). These assets provide

51  
00:02:00,868 --> 00:02:02,784  
complementary capabilities

52  
00:02:02,819 --> 00:02:04,081  
needed to meet a

53  
00:02:04,116 --> 00:02:05,361  
broad range of ECLSS

54  
00:02:05,396 --> 00:02:06,977  
test objectives. For

55  
00:02:07,012 --> 00:02:07,871  
example, future

56  
00:02:07,906 --> 00:02:09,104  
missions may benefit from

57  
00:02:09,139 --> 00:02:09,968  
maintaining spacecraft

58  
00:02:10,003 --> 00:02:11,583  
cabins at conditions

59  
00:02:11,618 --> 00:02:12,592  
that are different from

60  
00:02:12,627 --> 00:02:13,936  
the normal earth-like

61  
00:02:13,971 --> 00:02:14,912  
ones that are currently

62  
00:02:14,947 --> 00:02:15,776  
maintained on the

63  
00:02:15,811 --> 00:02:19,281

ISS. Marshall has two module simulators,

64

00:02:19,316 --> 00:02:20,832

the Exploration Test

65

00:02:20,867 --> 00:02:22,257

Chamber (E-Chamber)

66

00:02:22,292 --> 00:02:23,441

and the Vacuum Test

67

00:02:23,476 --> 00:02:24,849

Chamber (V-Chamber),

68

00:02:24,884 --> 00:02:26,512

which will have the capability to mimic

69

00:02:26,547 --> 00:02:28,063

other cabin environments

70

00:02:28,098 --> 00:02:28,992

in order to test

71

00:02:29,027 --> 00:02:30,816

future ECLSS hardware.

72

00:02:30,851 --> 00:02:32,240

For us it is about

73

00:02:32,275 --> 00:02:33,584

the hardware. Because

74

00:02:33,619 --> 00:02:34,848

we are touching hardware

75

00:02:34,883 --> 00:02:36,737

That's going to fly we are developing

76

00:02:36,772 --> 00:02:39,681

hardware, evaluating

77

00:02:39,716 --> 00:02:40,801

those technologies that

78

00:02:40,836 --> 00:02:43,439

might be used in the future, since we

79

00:02:43,474 --> 00:02:44,448

have our hardware

80

00:02:44,483 --> 00:02:45,504

aboard space station. So

81

00:02:45,539 --> 00:02:47,088

there is something new everyday whether

82

00:02:47,123 --> 00:02:49,424

it is developing new

83

00:02:49,459 --> 00:02:50,688

hardware or looking at

84

00:02:50,723 --> 00:02:53,232

doing research on new hardware or taking

85

00:02:53,267 --> 00:02:54,929

a piece of hardware

86

00:02:54,964 --> 00:02:55,905

that has already been

87

00:02:55,940 --> 00:02:56,816

selected and tuning it

88

00:02:56,851 --> 00:02:59,552

into nice shiny piece