
FUEL AIR FAN RAD
-2 0 41 0.94
06/12/12 15:14:03

1
00:00:00,556 --> 00:00:01,896
This is Mission Control,
Houston.

2
00:00:01,896 --> 00:00:05,326
The crew of Expedition 31 has
had a very busy week so far

3
00:00:05,326 --> 00:00:06,576
on board the orbiting complex.

4
00:00:06,576 --> 00:00:08,016
They've had quite
a bit of science

5
00:00:08,016 --> 00:00:09,816
and other mechanical
work on board.

6
00:00:10,666 --> 00:00:11,456
There's been dozens

7
00:00:11,456 --> 00:00:14,116
of experiments this week
including studying some

8
00:00:14,116 --> 00:00:15,166
fundamental physics.

9
00:00:15,756 --> 00:00:18,936
The crew took a look at what's
called electrostatic interaction

10
00:00:18,936 --> 00:00:22,556
between electrically charged
particles up in zero gravity.

11
00:00:23,486 --> 00:00:26,256
They also took a look at the

gas-liquid phase separation

12
00:00:26,256 --> 00:00:28,896
that occurs on what's called
fine dispersion particles.

13
00:00:30,406 --> 00:00:33,086
The crew also worked on
one of the facility racks

14
00:00:33,086 --> 00:00:34,456
that is inside the
Kibo laboratory.

15
00:00:34,456 --> 00:00:36,456
It's called the Fluid
Physics Experiment Facility.

16
00:00:36,996 --> 00:00:39,716
This examines how
fluids behave up there

17
00:00:40,306 --> 00:00:41,946
in the microgravity environment.

18
00:00:41,946 --> 00:00:45,646
That's going to be important for
future spacecraft design as well

19
00:00:45,646 --> 00:00:47,256
as implications here on Earth.

20
00:00:48,106 --> 00:00:50,826
The crew also looked at how
jet engine exhaust interacts

21
00:00:50,826 --> 00:00:52,376
with the upper reaches
of the atmosphere.

22
00:00:52,376 --> 00:00:53,806
They also studied quite a bit

23
00:00:53,956 --> 00:00:56,046
about how the human
body behaves in space.

24
00:00:56,046 --> 00:00:58,576
It's one of the main
benefits of the space station

25
00:00:58,576 --> 00:01:01,206
as we take a look at
venturing further on to Mars

26
00:01:01,206 --> 00:01:02,576
and to an asteroid
one of these days.

27
00:01:03,756 --> 00:01:05,366
The crew worked on something
called the Integrated

28
00:01:05,366 --> 00:01:08,416
Cardiovascular Ambulatory
Monitoring Experiment.

29
00:01:09,326 --> 00:01:10,606
This where each of
the crew members -

30
00:01:11,266 --> 00:01:13,376
depending on who's the
subject of the experiment -

31
00:01:14,106 --> 00:01:17,716
wears a blood pressure
check that happens

32

00:01:17,716 --> 00:01:19,186
over the course of 24 hours.

33
00:01:19,676 --> 00:01:22,046
They also do something
that's very similar

34
00:01:22,046 --> 00:01:24,606
to what would you find here on
Earth, which is an EKG machine.

35
00:01:24,606 --> 00:01:26,406
It measures the output
of the heart.

36
00:01:27,276 --> 00:01:30,016
All of that determines how the
crew's cardiovascular system

37
00:01:30,016 --> 00:01:31,176
reacts to being up there

38
00:01:31,626 --> 00:01:33,486
on board the complex
for up to six months.

39
00:01:34,736 --> 00:01:35,346
The crew also worked

40
00:01:35,346 --> 00:01:38,276
with something called the Lower
Body Negative Pressure Device.

41
00:01:38,276 --> 00:01:39,456
This is a pair of
pants that they put

42
00:01:39,456 --> 00:01:41,716
on that basically
decreases pressure.

43
00:01:42,286 --> 00:01:43,776
It draws blood down
from the head.

44
00:01:43,776 --> 00:01:45,896
It sort of reenacts what happens
to them whenever they land

45
00:01:45,896 --> 00:01:49,536
on Earth, and then studies
the effects that gravity has

46
00:01:49,536 --> 00:01:52,136
on the crew members' bodies
after they've been up in space

47
00:01:52,136 --> 00:01:53,586
for an extended period of time.

48
00:01:54,286 --> 00:01:57,146
The crew also spent some time
studying fire up in space.

49
00:01:57,146 --> 00:01:59,796
Fire behaves completely
differently up in space

50
00:01:59,796 --> 00:02:01,896
in the vacuum and the
absence of gravity

51
00:02:02,406 --> 00:02:03,486
than it does here on the ground.

52
00:02:03,486 --> 00:02:05,796
The crew worked on a device
called the Combustion Integrated

53

00:02:05,796 --> 00:02:09,866
Rack which tests different fuels
and finds out how they combust.

54
00:02:10,566 --> 00:02:12,716
The crew spent a significant
amount of time working

55
00:02:12,716 --> 00:02:13,886
on something called BASS.

56
00:02:13,886 --> 00:02:15,726
This is Burning And
Suppression of Solids.

57
00:02:16,506 --> 00:02:18,976
This takes a look at how
flames burn up in space.

58
00:02:18,976 --> 00:02:21,266
It's quite a bit different
when we put out a fire

59
00:02:21,406 --> 00:02:23,006
up in space versus
here on earth.

60
00:02:23,956 --> 00:02:25,716
Typically what happens
here on the ground,

61
00:02:25,716 --> 00:02:28,266
you would aim the fire
extinguisher or the suppressant

62
00:02:28,706 --> 00:02:29,856
at the base of the flame.

63
00:02:29,856 --> 00:02:32,056
This is because that is where

the flame is the most stable.

64
00:02:32,516 --> 00:02:36,186
It's where the flame is
basically born, where the oxygen

65
00:02:36,216 --> 00:02:38,376
and the air enters the flame
and sort of creates it.

66
00:02:38,866 --> 00:02:40,696
But of course up in space
you don't have that,

67
00:02:40,696 --> 00:02:43,766
so the BASS experiment takes
a look at how the fire behaves

68
00:02:44,286 --> 00:02:47,686
and how someone would put
out that fire up in space.

69
00:02:48,316 --> 00:02:50,306
The crew also worked on what's
called the Amine Swingbed.

70
00:02:50,416 --> 00:02:53,626
This is a prototype test object
for the Orion spacecraft,

71
00:02:53,626 --> 00:02:56,206
which is the spacecraft that
NASA is building to take us

72
00:02:56,206 --> 00:02:57,716
to an asteroid and on to Mars.

73
00:02:58,716 --> 00:03:01,186
Size is key whenever
it comes to Orion,

74
00:03:01,186 --> 00:03:03,206
so all the different
environmental systems inside

75
00:03:03,206 --> 00:03:05,516
Orion need to be small,
compact and efficient.

76
00:03:06,126 --> 00:03:07,426
This Amine Swingbed is a way

77
00:03:07,426 --> 00:03:11,326
to test the carbon dioxide
removal assembly that will go

78
00:03:11,326 --> 00:03:13,586
on Orion up on board
the space station.

79
00:03:13,586 --> 00:03:16,026
The space station itself
actually has a couple

80
00:03:16,026 --> 00:03:18,366
of different systems that
scrub out the carbon dioxide,

81
00:03:18,826 --> 00:03:20,526
including one in the
Destiny laboratory,

82
00:03:20,586 --> 00:03:21,956
one in the Tranquilly module.

83
00:03:22,496 --> 00:03:24,016
Those are fairly large in size.

84
00:03:24,016 --> 00:03:24,976

They work very efficiently,

85
00:03:25,526 --> 00:03:27,896
but the space station
provides an opportunity to test

86
00:03:27,896 --> 00:03:31,446
out new equipment and new
devices that will go on Orion.

87
00:03:32,596 --> 00:03:34,636
And three out of the six crew
members are turning their

88
00:03:34,636 --> 00:03:36,696
attention toward their
trip home, which is coming

89
00:03:36,696 --> 00:03:37,866
up in a couple of weeks.

90
00:03:37,866 --> 00:03:40,876
Andre Kuipers, Oleg Kononenko
and Don Pettit getting ready

91
00:03:40,876 --> 00:03:43,836
to wrap up 193 days in space,

92
00:03:43,976 --> 00:03:46,416
191 of those aboard
the orbiting complex.

93
00:03:46,886 --> 00:03:49,326
They've been getting
themselves and their belongings

94
00:03:49,326 --> 00:03:51,716
that are coming home, as
well as their spacecraft,

95
00:03:51,716 --> 00:03:53,346
ready for the landing, which is

96
00:03:53,346 --> 00:03:56,266
at 3:15 a.m. Central
time on Sunday, July 1.

97
00:03:57,146 --> 00:03:59,306
They've been packing it full of
cargo that's going to come home.

98
00:04:00,106 --> 00:04:02,946
The three of those also
checked out their seat liners.

99
00:04:03,516 --> 00:04:06,176
This is the chairs that they sit
in whenever they come back home.

100
00:04:06,176 --> 00:04:08,476
Those are form-fitted to
each one of the crew members,

101
00:04:08,916 --> 00:04:11,516
but because the human body gets
a little bit taller in space

102
00:04:11,516 --> 00:04:13,756
because gravity's not pulling
down on your muscles and bones,

103
00:04:14,226 --> 00:04:16,376
they have to check out
the seats and get in them

104
00:04:16,376 --> 00:04:17,476
to make sure that
they still fit.

105

00:04:17,966 --> 00:04:19,406
Everything checked
out according to plan,

106
00:04:19,406 --> 00:04:22,156
and these three crew members
are getting ready to wrap

107
00:04:22,156 --> 00:04:25,016
up their time as part
of Expedition 31.

108
00:04:25,486 --> 00:04:26,906
So once again, landing scheduled

109
00:04:26,906 --> 00:04:31,106
for 3:15 a.m. Central
time, Sunday, July 1.

110
00:04:31,396 --> 00:04:33,866
That'll be at 4:15
a.m. Eastern time.