1
00:00:04,056 --> 00:00:04,926
>> We heard earlier in the hour

2
00:00:04,926 --> 00:00:07,966
from public affairs officer
Lanette Madison talking

3
00:00:07,966 --> 00:00:12,596
with Mallery Jennings the
seaport human testing lead

4
00:00:12,596 --> 00:00:17,986
for some tests that are going
on with some new equipment here

5
00:00:17,986 --> 00:00:19,806
at Johnson Space Center in one

6
00:00:19,806 --> 00:00:21,516
of our vacuum chambers
in building 32.

7
00:00:21,516 --> 00:00:24,646
We're going to go now back to
Lanette Madison who is going

8
00:00:24,646 --> 00:00:26,846
to be this time talking
with Joel Maganza

9
00:00:26,846 --> 00:00:27,966
who is the test director

10
00:00:27,966 --> 00:00:31,006
for this unman test
that's going on now.

11
00:00:31,166 --> 00:00:31,556
Lanette.

12
00:00:34,416 --> 00:00:35,316
>> Thank you, Brandy.

13
00:00:35,436 --> 00:00:39,396
We are back here in building
32 in the control chamber

14
00:00:39,786 --> 00:00:42,966
in the control room for
chamber B and I have here

15
00:00:42,966 --> 00:00:47,296
with me Joel Maganza who is the
testing director for this test

16
00:00:47,296 --> 00:00:49,666
and Joel while we were off
camera Joel actually told me a

17
00:00:49,666 --> 00:00:51,756
couple of interesting
things and I wanted him

18
00:00:51,756 --> 00:00:53,406
to share this with our audience.

19
00:00:53,716 --> 00:00:55,326
So, Joel, tell me a
little bit about chamber A?

20
00:00:55,386 --> 00:00:59,096
>> Well first of all chamber A
is the world's largest thermal

21
00:00:59,096 --> 00:00:59,806
vacuum chamber.

22
00:00:59,876 --> 00:01:05,336

We have it here at NASA we have
used it back in the Apollo days

23
00:01:05,386 --> 00:01:08,656
but it hasn't been used
often in recent years.

24
00:01:09,096 --> 00:01:12,296
What we're doing right now is
doing a lot of upgrades to it,

25
00:01:12,636 --> 00:01:15,786
to our LM2 system and our
pressers systems on it

26
00:01:15,786 --> 00:01:17,276
and we're trying
to get that ready

27
00:01:17,276 --> 00:01:21,436
to test the James Webb space
telescope in 2015 and 16.

28
00:01:21,866 --> 00:01:23,796
>> That's pretty
exciting to have that kind

29
00:01:23,796 --> 00:01:26,266
of new opportunity here at
the Johnson Space Center.

30
00:01:26,266 --> 00:01:27,636
>> It is really great to
have something like that.

31
00:01:27,636 --> 00:01:32,536
Something like the Hubble
will advance a lot we know

32
00:01:32,536 --> 00:01:35,316

about space and take it either
even further then we already

33
00:01:35,316 --> 00:01:35,726
have it right now.

34
00:01:36,186 --> 00:01:38,466
>> So tell me about
chamber B you said --

35
00:01:38,466 --> 00:01:41,816
I asked you if there was
something about chamber B other

36
00:01:41,816 --> 00:01:43,656
than it's a thermal vac chamber

37
00:01:44,346 --> 00:01:48,406
and you told me two things
one is that it is the only?

38
00:01:49,026 --> 00:01:52,336
>> It is the only human
rated thermal vacuum chamber

39
00:01:52,336 --> 00:01:52,946
in the world.

40
00:01:53,636 --> 00:01:56,406
We have other vacuum chambers
here at NASA and other parts

41
00:01:56,406 --> 00:02:00,086
of the world where a person
can be in a space suit

42
00:02:00,086 --> 00:02:02,566
or in some kind of suit and
be in a vacuum environment

43
00:02:02,566 --> 00:02:04,676
but this is the only one
that can simulate the thermal

44
00:02:04,676 --> 00:02:05,976
and vacuum properties of space.

45
00:02:06,696 --> 00:02:08,466
And the other thing was
you told me something

46
00:02:08,466 --> 00:02:12,166
about your very first
testing run here and when was

47
00:02:12,166 --> 00:02:13,146
that and what happened.

48
00:02:13,146 --> 00:02:17,526
>> Yes. Back when hurricane Ike
hit Houston the railroad museum

49
00:02:17,526 --> 00:02:21,046
in Galveston, Texas was actually
badly flooded they have a lot

50
00:02:21,046 --> 00:02:25,916
of documents and records from
the early 1800s that came to us

51
00:02:25,916 --> 00:02:28,026
to ask if there was
anything we could do to help

52
00:02:28,406 --> 00:02:31,756
and there is actually a
process using the vacuum chamber

53
00:02:32,006 --> 00:02:34,416

that we were able to dry out
a lot of their old documents

54
00:02:34,866 --> 00:02:38,226
and still preserve
the paper as usually

55
00:02:38,226 --> 00:02:40,336
when paper gets wet
it's pretty ruined

56
00:02:40,626 --> 00:02:42,426
but using the vacuum
process we were able

57
00:02:42,426 --> 00:02:44,106
to help salvage a lot
of their documents.

58
00:02:44,426 --> 00:02:45,186
>> That's incredible.

59
00:02:45,186 --> 00:02:47,216
I had never heard
that while I was here

60
00:02:47,216 --> 00:02:48,586
so that's pretty interesting.

61
00:02:48,926 --> 00:02:50,506
So tell me about
today's testing.

62
00:02:50,646 --> 00:02:55,056
We've learned that we're testing
a suit port but tell me about --

63
00:02:55,056 --> 00:02:57,716
I saw over here on one of
the computer screens all

64
00:02:58,236 --> 00:03:02,726
of these diagrams, and
their words on there

65
00:03:02,726 --> 00:03:04,866
like strain gauges so tell
me what is a strain gauge

66
00:03:04,866 --> 00:03:05,636
and what you're testing.

67
00:03:05,846 --> 00:03:07,866
>> Well any time we
test what you see

68
00:03:07,866 --> 00:03:10,766
in the chamber what you
see visually is just part

69
00:03:10,766 --> 00:03:11,156
of the picture.

70
00:03:11,156 --> 00:03:15,246
There's a whole underlying
iceberg there of all the gauges

71
00:03:15,616 --> 00:03:17,806
and data that we're
going to be taking.

72
00:03:18,216 --> 00:03:22,396
For this test we're measuring
different pressure differentials

73
00:03:22,756 --> 00:03:25,456
across the suit port
and the blinding plate.

74

00:03:25,776 --> 00:03:29,306
We're also measuring the
strain gauges which kind

75
00:03:29,466 --> 00:03:32,496
of tell us how much force
is acting on different parts

76
00:03:32,566 --> 00:03:35,536
of the blank plate and what's
that going to do is help us

77
00:03:35,536 --> 00:03:37,196
when we put a suit in there
to let us know what kind

78
00:03:37,196 --> 00:03:39,676
of forces are going to be
interacting on the frame

79
00:03:39,676 --> 00:03:41,756
around that suit and
how it's going to --

80
00:03:42,756 --> 00:03:44,416
how the delta pressure
will take effect.

81
00:03:45,116 --> 00:03:46,936
>> So what is the delta pressure

82
00:03:46,936 --> 00:03:50,056
and what is the pressure
variance in that chamber?

83
00:03:50,346 --> 00:03:52,636
>> The delta pressure
for this test will be --

84
00:03:53,406 --> 00:03:56,156

well what the delta pressure
is, it's a differential pressure

85
00:03:56,156 --> 00:03:59,766
between two different things.

86
00:04:00,386 --> 00:04:03,236
So right now we are at 14.7 PSIA

87
00:04:03,376 --> 00:04:05,246
which is the atmospheric
pressure of earth

88
00:04:05,596 --> 00:04:09,686
and this chamber we are going
to pump down to about 6.4 PSIA,

89
00:04:09,686 --> 00:04:12,056
so we'll have a difference
in pressure

90
00:04:12,056 --> 00:04:15,716
of 8.3 pounds per square
inch during this test.

91
00:04:16,076 --> 00:04:18,316
And what that will do is
simulate the difference

92
00:04:18,316 --> 00:04:21,446
in pressure when an astronaut
or crew member would go

93
00:04:21,446 --> 00:04:24,426
out in this suit to what they
would be to their environment.

94
00:04:24,796 --> 00:04:28,126
Some day eventually we will
pump this down to vacuum

95
00:04:28,426 --> 00:04:31,196
and have the suit pressurize
at 8.3 much like we do

96
00:04:31,196 --> 00:04:33,186
with our training for
astronauts in the EMU now.

97
00:04:33,376 --> 00:04:35,866
>> And will you do that with
the man test that's coming up

98
00:04:35,866 --> 00:04:37,236
or will you do something
a little bit different?

99
00:04:37,236 --> 00:04:39,726
>> For this man test we are
only pumping them chamber done

100
00:04:39,806 --> 00:04:41,236
to 6.4.

101
00:04:41,236 --> 00:04:44,556
The test subject and crew
members inside will remain

102
00:04:44,556 --> 00:04:51,946
at 14.7 so this is a low hazard
for this and the further we pump

103
00:04:51,946 --> 00:04:53,686
down the more we go to
vacuum the more hazardous the

104
00:04:53,686 --> 00:04:54,256
test becomes.

105

00:04:55,156 --> 00:04:56,906
>> And what is the
long term plan

106
00:04:56,906 --> 00:04:58,456
for this all of these testings?

107
00:04:58,456 --> 00:05:01,626
I mean how many testings will
you be participating it in?

108
00:05:01,996 --> 00:05:03,856
>> Me personally I
will be participating

109
00:05:03,856 --> 00:05:05,336
in almost all of them.

110
00:05:05,386 --> 00:05:09,256
There is a four year plan down
the road for several other tests

111
00:05:09,676 --> 00:05:13,836
and other variations of the
Z1 suit and the suit port

112
00:05:14,176 --> 00:05:15,336
with different mechanisms.

113
00:05:15,736 --> 00:05:17,856
So we're going to be testing
different configurations

114
00:05:17,906 --> 00:05:21,646
to determine which one is
the best one to drive forward

115
00:05:21,956 --> 00:05:24,056
to be used for the next
generation of space suits

116
00:05:24,056 --> 00:05:24,976
and space exploration.

117
00:05:25,746 --> 00:05:28,666
>> So this test today
again is an unmanned test

118
00:05:29,236 --> 00:05:31,566
and how long will the test run.

119
00:05:31,566 --> 00:05:35,416
>> This test will go about two
days, we're doing four runs,

120
00:05:35,566 --> 00:05:36,866
two runs in two days

121
00:05:37,776 --> 00:05:39,976
which should cover all
our unmanned requirements.

122
00:05:40,206 --> 00:05:42,316
After that we'll be
installing the Z1 suit

123
00:05:42,346 --> 00:05:43,946
and then we have
two weeks of testing

124
00:05:44,246 --> 00:05:45,936
with five different test
subjects after that.

125
00:05:46,296 --> 00:05:49,366
>> How many people are
involved in the testing?

126
00:05:49,366 --> 00:05:51,486

How many people work
in the chamber?

127
00:05:51,966 --> 00:05:54,136
>> Well an unman test
we don't have very many.

128
00:05:54,136 --> 00:05:56,606
We have a few engineers
and a few technicians

129
00:05:56,966 --> 00:05:59,606
and a test director
and requesters.

130
00:05:59,606 --> 00:06:02,086
When we go to man tests
it's much more hazardous

131
00:06:02,086 --> 00:06:04,846
since we have somebody
in a vacuum environment,

132
00:06:05,206 --> 00:06:08,226
so we have to add in
medical personal on standby,

133
00:06:08,226 --> 00:06:11,026
we have to add in rescue
techs, and we have to add

134
00:06:11,026 --> 00:06:14,256
in basically a lot more sets
of eyes to monitor all the data

135
00:06:14,256 --> 00:06:15,916
and to monitor the
individual in the suit.

136
00:06:16,846 --> 00:06:20,076

>> So the information
that we've learned today,

137
00:06:20,476 --> 00:06:22,386
you'll use that to
modify the suit

138
00:06:22,476 --> 00:06:25,086
and you're really just
looking at the pressures

139
00:06:25,086 --> 00:06:27,086
and the forces on this suit?

140
00:06:27,086 --> 00:06:28,366
Explain a little bit
more to me about that.

141
00:06:28,366 --> 00:06:29,826
>> The information
we're gathering today

142
00:06:29,826 --> 00:06:32,836
and tomorrow will be used
to basically to verify

143
00:06:32,836 --> 00:06:35,806
that this set up is
acceptable to install a suit

144
00:06:36,106 --> 00:06:37,386
and have a person in that suit.

145
00:06:37,806 --> 00:06:39,826
Once we start the man testing

146
00:06:39,826 --> 00:06:42,746
that will tell us what
modifications need to be made

147
00:06:42,876 --> 00:06:46,406
to the suit the ingress
and egress into the suit

148
00:06:46,406 --> 00:06:49,946
and suit port, but for right
now we're basically making sure

149
00:06:49,946 --> 00:06:52,576
that everything is safe so that
when we have somebody crawl

150
00:06:52,716 --> 00:06:57,386
in they know they're safe and we
can basically take care of them.

151
00:06:57,976 --> 00:06:59,556
>> Well let me ask you
something about you, Joel,

152
00:07:00,016 --> 00:07:02,096
how long have you
been testing director?

153
00:07:02,426 --> 00:07:04,646
>> I've been a test director
here for a five years.

154
00:07:04,646 --> 00:07:08,166
I started out as an engineer
in this building working mostly

155
00:07:08,166 --> 00:07:10,746
on chamber A to get ready the
James Webb Space telescope

156
00:07:11,166 --> 00:07:14,136
and I've been doing five years
of test directing for unmanned

157
00:07:14,136 --> 00:07:15,376
and man tests here at NASA.

158
00:07:15,876 --> 00:07:17,466
>> And what kind of
degree do you have?

159
00:07:17,826 --> 00:07:19,516
>> I have an aerospace
engineering degree

160
00:07:19,516 --> 00:07:20,456
from West Point.

161
00:07:20,966 --> 00:07:22,636
And I spent six years
in the military

162
00:07:22,636 --> 00:07:24,996
after that before coming
here to start working.

163
00:07:25,416 --> 00:07:26,396
>> Thank you very much, Joel.

164
00:07:26,396 --> 00:07:26,616
>> Thank you.

165
00:07:26,786 --> 00:07:29,846
>> Joel Manganza and we
are here in billing 32 back