
Device OFF
Sled vibrates building
Building vibrations splash water
Inside Saturn V Dynamic Test Stand

1
00:00:00,000 --> 00:00:07,046
Music

2
00:00:08,423 --> 00:00:09,654
When you look at the vibration

3
00:00:09,689 --> 00:00:11,469
characteristics of tall buildings,

4
00:00:11,504 --> 00:00:13,637
oil platforms, aircraft,

5
00:00:13,672 --> 00:00:14,717
there's so many things that

6
00:00:14,752 --> 00:00:16,548
wiggle, and wiggling

7
00:00:16,583 --> 00:00:26,678
is not good.

8
00:00:26,713 --> 00:00:27,718
It's a paradigm shift.

9
00:00:27,753 --> 00:00:28,534
It's a slight shift in

10
00:00:28,569 --> 00:00:29,566
the way you think.

11
00:00:29,601 --> 00:00:31,126
It's a technology that

12
00:00:31,161 --> 00:00:32,317
we developed to couple

13
00:00:32,352 --> 00:00:33,796

the way fluid and

14
00:00:33,831 --> 00:00:35,381
structure interact.

15
00:00:35,416 --> 00:00:36,645
We had a rocket, the Ares

16
00:00:36,680 --> 00:00:37,670
Launch Vehicle, that had

17
00:00:37,705 --> 00:00:38,614
a very significant

18
00:00:38,649 --> 00:00:40,166
dynamic issue, and we

19
00:00:40,201 --> 00:00:42,086
found a way to use the

20
00:00:42,121 --> 00:00:43,189
existing mass in the

21
00:00:43,224 --> 00:00:44,493
LOX tank, the weight of

22
00:00:44,528 --> 00:00:45,974
the fluid, to mitigate

23
00:00:46,009 --> 00:00:47,198
dynamic response of

24
00:00:47,233 --> 00:00:48,470
the entire structure.

25
00:00:48,505 --> 00:00:49,749
One small device weighing

26
00:00:49,784 --> 00:00:52,022
less than 100 pounds on

27
00:00:52,057 --> 00:00:53,341
the device itself, less

28
00:00:53,376 --> 00:00:54,997
than 200 pounds total impact

29
00:00:55,032 --> 00:00:56,174
was able to mitigate the

30
00:00:56,209 --> 00:00:57,213
resonant response of a

31
00:00:57,248 --> 00:01:01,462
650,000-pound launch vehicle.

32
00:01:01,497 --> 00:01:02,326
By controlling the way

33
00:01:02,361 --> 00:01:03,470
that secondary device

34
00:01:03,505 --> 00:01:04,565
controls that fluid,

35
00:01:04,600 --> 00:01:05,501
we can control the

36
00:01:05,536 --> 00:01:06,821
primary system.

37
00:01:06,856 --> 00:01:12,389
Currently, for a lot

38
00:01:12,424 --> 00:01:13,477

of the systems that

39
00:01:13,512 --> 00:01:14,293
are out there that

40
00:01:14,328 --> 00:01:15,190
use fluids, it's all

41
00:01:15,225 --> 00:01:16,030
about containing the

42
00:01:16,065 --> 00:01:17,253
fluids and then you

43
00:01:17,288 --> 00:01:18,005
set up the frequency

44
00:01:18,040 --> 00:01:19,229
of your mitigation

45
00:01:19,264 --> 00:01:20,245
based upon your

46
00:01:20,280 --> 00:01:21,062
container.

47
00:01:21,097 --> 00:01:21,654
The container is

48
00:01:21,689 --> 00:01:32,557
what sets the frequency.

49
00:01:32,592 --> 00:01:33,230
This is different.

50
00:01:33,265 --> 00:01:34,198
The frequency here is

51
00:01:34,233 --> 00:01:36,222
set by the secondary

52
00:01:36,257 --> 00:01:38,662
device.

53
00:01:38,697 --> 00:01:39,190
Our device is special

54
00:01:39,225 --> 00:01:39,934
because it uses the

55
00:01:39,969 --> 00:01:41,133
mass that we add,

56
00:01:41,168 --> 00:01:42,765
either additionally

57
00:01:42,800 --> 00:01:44,117
to a structure or

58
00:01:44,152 --> 00:01:45,397
with the existing

59
00:01:45,432 --> 00:01:46,205
fluid.

60
00:01:46,240 --> 00:01:46,853
We use it more

61
00:01:46,888 --> 00:01:47,725
efficiently than anybody

62
00:01:47,760 --> 00:01:48,589
has ever been able

63
00:01:48,624 --> 00:01:50,550

to do before.

64
00:01:50,585 --> 00:01:51,285
Anywhere that fluids

65
00:01:51,320 --> 00:01:52,285
and structures currently cohabitate

66
00:01:52,320 --> 00:01:54,006
is where you can take

67
00:01:54,041 --> 00:01:55,389
advantage of this.

68
00:01:55,424 --> 00:01:56,445
Buildings is one place

69
00:01:56,480 --> 00:01:57,662
where you've got fluids

70
00:01:57,697 --> 00:01:58,886
already in situ; inside

71
00:01:58,921 --> 00:01:59,822
the building.

72
00:01:59,857 --> 00:02:01,350
Aircraft carry their own fluids.

73
00:02:01,385 --> 00:02:02,557
In the automobile or

74
00:02:02,592 --> 00:02:04,229
you're transporting

75
00:02:04,264 --> 00:02:05,309
fluids across country

76
00:02:05,344 --> 00:02:06,606
in a tanker truck.

77
00:02:06,641 --> 00:02:07,598
Ocean-going vessels,

78
00:02:07,633 --> 00:02:08,614
platforms that are

79
00:02:08,649 --> 00:02:09,230
floating out there

80
00:02:09,265 --> 00:02:09,957
in the ocean.

81
00:02:09,992 --> 00:02:10,806
The question is,

82
00:02:10,841 --> 00:02:12,405
can you access the fluid that's

83
00:02:12,440 --> 00:02:13,277
surrounding you?

84
00:02:13,312 --> 00:02:14,709
Not only can you use this

85
00:02:14,744 --> 00:02:16,494
technology for existing

86
00:02:16,529 --> 00:02:18,038
structures that have problems,

87
00:02:18,073 --> 00:02:19,653
but if you employ it from the

88
00:02:19,688 --> 00:02:21,325

beginning in the design phase,

89
00:02:21,360 --> 00:02:22,869
you can change the attributes

90
00:02:22,904 --> 00:02:24,398
of the design completely.

91
00:02:24,433 --> 00:02:25,614
This is a game-changer.

92
00:02:25,649 --> 00:02:26,358
We're going to change