
Michael Gazarik
NASA Associate Administrator of the Space Technology Mission
NASA Headquarters

1
00:00:00,000 --> 00:00:03,000
(Music)

2
00:00:03,000 --> 00:00:07,000
In order to land things on Mars, we need to slow them down before they hit the surface.

3
00:00:07,000 --> 00:00:11,000
We use the Martian atmosphere to do that but the Martian atmosphere is very, very thin -

4
00:00:11,000 --> 00:00:16,000
it's only 1 percent as thick as Earth's atmosphere, so these decelerators have to go out very high speeds

5
00:00:16,000 --> 00:00:21,000
at Mars, at supersonic speed and have to be very large to slow the vehicle even down to speeds

6
00:00:21,000 --> 00:00:23,000
of a couple of hundred miles an hour.

7
00:00:23,000 --> 00:00:26,000
So what we have are an inflatable aerodynamic decelerator -

8
00:00:26,000 --> 00:00:30,000
that's the soft goods, this yellow textile article that you see in the side.

9
00:00:30,000 --> 00:00:35,000
And what will happen is that this will inflate very rapidly at a fraction of a second,

10
00:00:35,000 --> 00:00:38,000
about a third of second and it will increase the size of the aeroshell

11
00:00:38,000 --> 00:00:43,000
and it will create a surface much larger than the vehicle alone with which we can react

12
00:00:43,000 --> 00:00:48,000
against the atmosphere and generate more drag and slow the vehicle down further.

13
00:00:48,000 --> 00:00:51,000

(music)

14
00:00:51,000 --> 00:00:55,000
What we have out at the test range off of Hawaii is an ability of the infrastructure

15
00:00:55,000 --> 00:00:58,000
to be able to do this testing safely, effectively and efficiently.

16
00:00:58,000 --> 00:01:03,000
In the background here, we have our launch tower. We launch a large scientific balloon,

17
00:01:03,000 --> 00:01:08,000
a 34 million cubic foot helium balloon that carries our 7,000 lb. test vehicle

18
00:01:08,000 --> 00:01:13,000
up to a 120,000 feet in the atmosphere. That vehicle has on it a large rocket motor

19
00:01:13,000 --> 00:01:17,000
which then fires and takes the vehicle even higher up to 160 to 180,000 feet where the atmosphere

20
00:01:17,000 --> 00:01:22,000
is like it is at Mars where we'd use these decelerators and then it's going about sideways

21
00:01:22,000 --> 00:01:25,000
we deploy at Mach 4 the first decelerator which we call the SIAD

22
00:01:25,000 --> 00:01:30,000
- our supersonic inflatable aerodynamic decelerator - it's a large tube that inflates around the vehicle.

23
00:01:30,000 --> 00:01:36,000
That slows it down to Mach 2 1/2. At Mach 2 ½, we deploy a large 30-meter parachute.

24
00:01:36,000 --> 00:01:38,000
Those are the two technologies that we're testing.

25
00:01:38,000 --> 00:01:43,000
This is a shakeout test to see if we can get the vehicle up to the proper conditions. If the vehicle

26
00:01:43,000 --> 00:01:47,000
goes off-course or if it doesn't reach the trajectory that we want or we don't get the conditions

27
00:01:47,000 --> 00:01:49,000
we want or the cameras aren't working or any of those things -

28
00:01:49,000 --> 00:01:53,000
those are exactly what we're looking for to learn what happens, take that information,

29
00:01:53,000 --> 00:01:56,000
incorporate it into the next two flights that we have next year.

30
00:01:56,000 --> 00:02:00,000
Some would argue in technology development that if you don't push the boundary

31
00:02:00,000 --> 00:02:05,000
a little bit you'll never learn. So we have to take the right amount of risk.

32
00:02:05,000 --> 00:02:07,000
We do the right calculations, we do good engineering

33
00:02:07,000 --> 00:02:10,000
but we are pushing the boundaries of these technologies.

34
00:02:10,000 --> 00:02:14,000
My boss told me that if this thing works perfectly,

35
00:02:14,000 --> 00:02:19,000
if it does exactly what we expected it to do, it exactly hits the targets that we want,

36
00:02:19,000 --> 00:02:23,000
it flies that way we want, it gets the data back exactly like we want, all the cameras work,