1
00:00:05,196 --> 00:00:07,026
>> You know we've got to
come with a better system,

2
00:00:07,026 --> 00:00:08,346
a better way to make sure

3
00:00:08,346 --> 00:00:11,766
that these pilots are getting
the oxygen and the protection

4
00:00:11,766 --> 00:00:12,676
that they need to go fly.

5
00:00:14,106 --> 00:00:17,146
>> If you're low on oxygen,
basically sometimes get euphoric

6
00:00:17,266 --> 00:00:19,706
or you'll get sleepy or
you'll kind of pass out.

7
00:00:20,116 --> 00:00:21,246
And obviously if you have

8
00:00:21,246 --> 00:00:23,526
to fly the airplane
that's not a good scenario.

9
00:00:23,526 --> 00:00:26,806
>> The Navy and the Air Force
has been experiencing problems

10
00:00:26,896 --> 00:00:31,226
with oxygen levels and content,
and pilots blacking out.

11
00:00:31,226 --> 00:00:32,836
>> You know you have

aircraft data.

12
00:00:32,936 --> 00:00:34,206
You have some, you
don't have a lot.

13
00:00:34,656 --> 00:00:37,146
But what you don't have
is any instrumentation

14
00:00:37,196 --> 00:00:39,156
on the pilot and
their breathing.

15
00:00:39,786 --> 00:00:43,596
And so what we were really
focused on was really trying

16
00:00:43,596 --> 00:00:45,596
to identify the root
cause in the pilot.

17
00:00:45,596 --> 00:00:48,666
Remember, physiological episodes
happen in people not aircraft.

18
00:00:49,216 --> 00:00:51,186
So if you don't have
the pilot instrumented,

19
00:00:51,746 --> 00:00:53,406
then you're really
not going to be able

20
00:00:53,406 --> 00:00:54,806
to help resolve the problems.

21
00:00:54,906 --> 00:00:58,636
>> Crew assignments,
I'll be in the jet,

22
00:00:58,636 --> 00:01:00,936
you guy will be in
the control room.

23
00:01:00,936 --> 00:01:02,516
Jack will be talking
on the radio.

24
00:01:02,516 --> 00:01:03,486
>> I'll be on the radio.

25
00:01:03,486 --> 00:01:06,066
>> The use of this project is
going to go for a long time.

26
00:01:06,066 --> 00:01:08,356
Because it's going to
establish a fundamental data set

27
00:01:08,356 --> 00:01:10,966
on how pilots breathe in
a tactical environment.

28
00:01:11,516 --> 00:01:20,546
[Inaudible]

29
00:01:21,046 --> 00:01:22,896
>> High performance type
aircraft like fighter jets,

30
00:01:23,226 --> 00:01:25,746
over the years they've become
more and more advanced.

31
00:01:26,216 --> 00:01:28,776
They can fly with higher
g's, they fly faster,

32

00:01:28,806 --> 00:01:30,406
they fly at higher
angles of attack.

33
00:01:30,756 --> 00:01:33,476
With all of those increases,
physiological effects

34
00:01:33,476 --> 00:01:35,786
on pilots has increased
dramatically.

35
00:01:36,166 --> 00:01:37,206
>> Every pilot is
going to be different

36
00:01:37,206 --> 00:01:38,196
on how they react to something.

37
00:01:38,196 --> 00:01:40,656
Cause they want to kind of
baseline what you're like before

38
00:01:40,656 --> 00:01:41,416
and what you're like after.

39
00:01:41,746 --> 00:01:43,276
>> So how do we gather the data?

40
00:01:43,406 --> 00:01:44,996
How does it go through
this process

41
00:01:45,176 --> 00:01:47,796
from the aircraft all
the way through to arrive

42
00:01:47,796 --> 00:01:49,076
at the analyst's desk?

43
00:01:49,076 --> 00:01:50,526
And what do they do with it?

44
00:01:50,526 --> 00:01:52,806
>> And one of the first things
we have to do is we have to look

45
00:01:52,806 --> 00:01:54,396
and see what kind of
flight they're doing.

46
00:01:54,876 --> 00:01:56,876
If they're doing a Navy
configuration flight

47
00:01:57,006 --> 00:01:58,376
or an Air Force configuration
flight.

48
00:02:01,326 --> 00:02:04,006
>> We'll take spirometry,
which is basically looking

49
00:02:04,006 --> 00:02:05,206
at lung capacity at the time.

50
00:02:05,276 --> 00:02:07,406
We do that like an
hour before the flight,

51
00:02:07,636 --> 00:02:09,076
just right after we
strap into the cockpit.

52
00:02:09,076 --> 00:02:11,346
And then when we come back we'll
do that again in the cockpit,

53
00:02:11,376 --> 00:02:13,666

and then after we've been
out for about an hour.

54
00:02:14,306 --> 00:02:16,576
>> The red 97 is
monitoring their pulse,

55
00:02:16,956 --> 00:02:19,116
their oxygen saturation
in their blood.

56
00:02:19,696 --> 00:02:22,396
Its also monitoring how
fast they're breathing.

57
00:02:23,256 --> 00:02:24,756
>> And that should be it.

58
00:02:25,566 --> 00:02:28,186
>> Pilot wears a VigilOX
system made by Cobham.

59
00:02:28,186 --> 00:02:32,336
With the VigilOX system, it
measures a lot of key parameters

60
00:02:32,586 --> 00:02:33,796
that are used for important

61
00:02:33,896 --> 00:02:36,506
for understanding what
the pilot is breathing

62
00:02:36,506 --> 00:02:37,376
in and breathing out.

63
00:02:37,536 --> 00:02:42,026
>> Put this side in first.

64

00:02:42,216 --> 00:02:45,126
>> In order to capture
all the data that we want,

65
00:02:45,126 --> 00:02:47,466
the pilots are flying
different profiles.

66
00:02:47,506 --> 00:02:49,666
Some are just high-altitude
flights,

67
00:02:49,666 --> 00:02:51,646
where you're flying
40 to 50,000 feet.

68
00:02:52,046 --> 00:02:54,766
Other ones are more
aerobatic, that's where they're

69
00:02:54,766 --> 00:02:57,476
up there doing spins
and turns and dives.

70
00:02:57,756 --> 00:03:00,696
>> And then, and we
correlate that type of flight

71
00:03:00,806 --> 00:03:03,336
and how it changes you know,
kind of your lung capacity

72
00:03:03,336 --> 00:03:04,056
or those kinds of things.

73
00:03:04,056 --> 00:03:05,556
So that's what the
scientists are looking for.

74
00:03:05,556 --> 00:03:08,786

>> We embarked on this with
the idea that we have a lot

75
00:03:08,786 --> 00:03:11,366
of complex test methods
that we're developing.

76
00:03:11,366 --> 00:03:15,866
And at the end of this, one of
our goals originally is we want

77
00:03:15,866 --> 00:03:19,476
to be able to develop test
methods that are useful

78
00:03:19,736 --> 00:03:22,246
to the Air Force and to
the Navy in the sense

79
00:03:22,246 --> 00:03:25,686
that they can be used in a
repeatable, consistent way

80
00:03:25,736 --> 00:03:27,936
that provide really
quality data.

81
00:03:28,246 --> 00:03:32,356
That then we can compare our
results with the Navy's results,

82
00:03:32,426 --> 00:03:34,696
and the Air Force's results.

83
00:03:36,116 --> 00:03:38,396
>> So I think this
will help make sure

84
00:03:38,396 --> 00:03:41,806
that the designs we have are

set for what the pilot needs.

85
00:03:41,926 --> 00:03:44,716
Cause if we don't really know
what the pilot needs very well,

86
00:03:45,046 --> 00:03:46,286
we can't design to that.

87
00:03:46,286 --> 00:03:48,796
And previous systems I think
just had a lot of margin

88
00:03:48,796 --> 00:03:51,066
to be able to accept
different needs from a pilot.

89
00:03:51,426 --> 00:03:55,126
But now that we've gotten you
know, closer to designing those

90
00:03:55,126 --> 00:03:57,276
to basically just what
they need, we really need