1
00:00:00,600 --> 00:00:06,389
[Music/Background Noise]

2
00:00:15,982 --> 00:00:18,468
>>SoOPSAR is Signals of Opportunity

3
00:00:18,468 --> 00:00:20,270
Synthetic Aperture Radar.

4
00:00:20,270 --> 00:00:24,708
It's a new type of radar
that's able to tell how deep the snow is.

5
00:00:24,708 --> 00:00:30,747
[Music/Background Noise]

6
00:00:31,848 --> 00:00:34,818
>>There's a team of about 15 volunteers

7
00:00:35,118 --> 00:00:39,289
measuring manual snow depth out
in Colorado and through California.

8
00:00:39,389 --> 00:00:42,358
And so, SoOPSAR,
the flight instrument flies

9
00:00:42,358 --> 00:00:46,613
around these sites and we compare
basically the SoOPSAR measurements

10
00:00:46,613 --> 00:00:50,150
and the ground measurements
to see how accurate we are.

11
00:00:52,952 --> 00:00:54,871
There's a huge advantage to studying this.

12

00:00:54,871 --> 00:00:58,141
Current weather forecasting systems
aren't the most accurate.

13
00:00:58,441 --> 00:00:59,426
Sometimes you have a trip

14
00:00:59,426 --> 00:01:02,545
planned out a few days in advance
and weather conditions suddenly change.

15
00:01:02,962 --> 00:01:05,698
We're hoping with this instrument
that weather measurements

16
00:01:05,698 --> 00:01:07,917
will be more accurate going forward.

17
00:01:07,917 --> 00:01:11,905
After these flights,
we intend to possibly propose

18
00:01:11,905 --> 00:01:15,291
a project that will involve
satellites up in the sky.

19
00:01:15,925 --> 00:01:18,561
This would allow for continuous automated

20
00:01:19,045 --> 00:01:23,516
kind of weather forecasting compared
to current measurement systems

21
00:11:12,455 --> 00:11:14,790
to help with future climate measurement.

22
00:11:15,241 --> 00:11:19,045
We're about a thousand foot AGL
from our sites and I think that height

23
00:11:19,045 --> 00:11:22,014
gives about a great level
for us to do our measurements.

24
00:11:22,314 --> 00:11:25,918
We prefer go into a place
right before a snowstorm and after.

25
00:11:26,419 --> 00:11:28,704
So we have a given baseline.

26
00:11:28,704 --> 00:11:32,491
If we have two measurements, one
before a storm and one after, we're able

27
00:11:32,491 --> 00:11:35,177
to see how accurate
the instrument is in multiple

28
00:11:35,695 --> 00:11:37,913
snow heights at the same area.

29
00:11:38,748 --> 00:11:41,400
But in this case, we do prefer to go

30
00:11:41,751 --> 00:11:45,388
after certain storms
to just maintain a constant baseline.

31
00:11:45,738 --> 00:11:48,140
So express
stands for signals of opportunity.

32
00:11:48,391 --> 00:11:50,092
Synthetic Aperture radar.

33
00:11:50,092 --> 00:11:53,546
Our project measures
snow depth through synthetic aperture

34
00:11:53,546 --> 00:11:56,932
radar techniques and tries
to get an accurate measurement.

35
00:11:56,966 --> 00:11:59,402
So we have a ground team
in about 15 on the ground.

36
00:12:00,169 --> 00:12:03,956
What they do is every couple of meters
they'll either get like these snow

37
00:12:03,956 --> 00:12:05,207
measurement probes.

38
00:12:05,207 --> 00:12:07,526
They'll stab into the ground
and it just gives them a height.

39
00:12:08,010 --> 00:12:11,664
We have just whole teams of people out
and complete volunteers,

40
00:12:11,664 --> 00:12:14,750
by the way, with snowshoes,
snowmobiles, skis.

41
00:12:14,750 --> 00:12:15,768
And they're just doing

42
00:12:15,768 --> 00:12:17,970
measurements on the ground
to give it the most accurate answer.

43
00:12:18,804 --> 00:12:22,074
To compare it as a baseline
to our instrument, they're just going in

44

00:12:22,074 --> 00:12:27,062
circles, mainly as from my knowledge
that it's kind of like, Oh, we're here.

45
00:12:27,563 --> 00:12:29,465
Hey, aircraft, we're over here.

46
00:12:29,465 --> 00:12:32,451
That's just a way of showing
where they are at the moment.

47
00:12:32,785 --> 00:12:34,670
In general, they are mostly probing.

48
00:12:34,670 --> 00:12:37,590
There's no really need
for those snow circles. Yeah,

49
00:12:38,641 --> 00:12:40,609
Someone had too much fun drifting.

50
00:12:40,609 --> 00:12:44,280
The King Air is a great utility vehicle,
and it serves a great purpose

51
00:12:44,280 --> 00:12:47,817
with our instrument in the in the King
Air during the missions.

52
00:12:48,501 --> 00:12:52,471
I'm a computer operator for the system
we have involves

53
00:12:52,738 --> 00:12:55,825
operating the receiver,
the computer systems, the switches.

54
00:12:56,509 --> 00:12:58,527
This is a multi machine instrument.

55
00:12:58,911 --> 00:13:01,680
Multiple instruments are talking
to each other at the same time.

56
00:13:02,431 --> 00:13:05,551
And we're using GPS
as we're using a radar system.

57
00:13:05,551 --> 00:13:07,620
We're using kind of a combination of both

58
00:13:07,620 --> 00:13:10,172
to track each individual waypoints
location.

59
00:13:10,706 --> 00:13:13,559
So because of all these little factors,
it's always great

60
00:13:13,559 --> 00:13:17,012
to have someone on board to either process
or maintain the instrument.

61
00:13:17,012 --> 00:13:22,368
And the failure just in Flight Software
Engineer Operative Stops Our Instrument.

62
00:13:22,701 --> 00:13:24,053
Justin.

63
00:13:24,053 --> 00:20:26,842
Justin Wynne.

64
00:20:32,998 --> 00:20:35,217
Yeah, it's a smooth flight.

65
00:20:35,367 --> 00:20:35,701
Oh, yeah.

66
00:20:35,701 --> 00:20:37,135
Appreciate it.

67
00:20:37,452 --> 00:20:37,719
Yeah.

68
00:20:39,838 --> 00:20:41,440
But he's going to close the door.

69
00:20:41,440 --> 00:20:42,691
Yeah.

70
00:20:42,691 --> 00:20:46,111
So the other.

71
00:20:47,479 --> 00:20:50,482
Can you get the doors
or make sure they get it?

72
00:20:50,482 --> 00:20:50,899
Yeah.

73
00:20:50,899 --> 00:20:57,089
But if you can get an

74
00:27:26,161 --> 00:27:28,947
or cancel that out.

75
00:27:30,482 --> 00:27:31,149
I know, but I did it.

76
00:27:31,149 --> 00:30:27,358
So you get into the

77
00:40:19,400 --> 00:41:25,966
right area

78

00:45:30,661 --> 00:45:34,948
when you want to take.

79
00:45:36,984 --> 00:45:38,969
That's what I was interested

80
00:46:33,740 --> 01:02:09,409
in. Of.

81
01:02:12,061 --> 01:02:12,695
Okay.

82
01:02:13,713 --> 01:02:14,664
It's working.

83
01:02:14,664 --> 01:02:15,348
Oh, yeah.

84
01:02:15,348 --> 01:02:18,751
You're going to walk into the aircraft.

85
01:02:19,652 --> 01:02:21,087
Nathan

86
01:02:21,838 --> 01:02:24,056
Randall. Dynamic.

87
01:02:24,056 --> 01:02:25,174
Powerful.

88
01:02:25,792 --> 01:02:28,044
Daunting.

89
01:02:28,194 --> 01:02:32,365
Samuel Ames, Engineer, systems
engineer extraordinaire.

90
01:02:33,032 --> 01:02:34,700

Walking to the aircraft, eating.

91
01:02:34,700 --> 01:02:35,902
The opening of

92
01:02:37,403 --> 01:02:38,571
your Tony Randall.

93
01:02:38,571 --> 01:02:42,175
Say something to be famous.

94
01:02:42,175 --> 01:02:45,745
This is the GoPro for the science.

95
01:02:46,129 --> 01:02:47,013
Look at us.

96
01:02:47,013 --> 01:02:49,248
Were over eight black

97
01:02:54,737 --> 01:02:58,641
science in action.

98
01:02:58,641 --> 01:03:01,244
And then yesterday in that other part of

99
01:03:11,537 --> 01:03:13,039
Right John Clue.

100
01:03:13,039 --> 01:03:15,391
Don't say anything We you're on camera and

101
01:03:16,609 --> 01:03:19,061
it wasn't welcome the NSA and 801.

102
01:03:19,529 --> 01:03:22,381
This is day eight of flying

103
01:03:24,984 --> 01:03:29,238
the eight February 331234567.

104
01:03:29,822 --> 01:03:32,241
We took to see something. Call me.

105
01:03:32,241 --> 01:03:34,160
Hi, everyone.

106
01:03:34,160 --> 01:03:35,862
All right,

107
01:03:36,329 --> 01:03:37,647
good.

108
01:03:37,947 --> 01:03:40,132
Just let me get a little more
the than the minimum

109
01:03:46,556 --> 01:03:49,609
oil prices already in the green

110
01:03:52,562 --> 01:03:54,113
for 50

111
01:03:54,413 --> 01:03:59,285
starters. Off.

112
01:03:59,285 --> 01:04:04,373
The Jews are good.

113
01:04:04,373 --> 01:04:05,992
Looks good techniques to.

114
01:04:05,992 --> 01:04:07,677
I see that

115

01:04:09,829 --> 01:04:12,832
the way I

116
01:04:20,840 --> 01:04:23,209
rock the voltages don't match.

117
01:04:23,209 --> 01:04:24,477
So that's good.

118
01:04:24,477 --> 01:04:27,496
Okay, Jet, Come on.

119
01:04:27,496 --> 01:04:29,932
That's good. Well below 50.

120
01:04:29,932 --> 01:04:31,400
That's coming on. Okay.

121
01:04:31,400 --> 01:04:32,418
Just waiting on

122
01:04:33,536 --> 01:04:33,769
your guy.

123
01:04:33,769 --> 01:04:36,022
Good start.

124
01:04:36,022 --> 01:04:40,877
Okay, great.

125
01:04:40,977 --> 01:04:41,694
Start

126
01:04:45,047 --> 01:04:47,516
looking for the.

127
01:04:47,516 --> 01:04:50,353
And I get the

128
01:04:51,220 --> 01:04:52,238
general