1
00:00:20,950 --> 00:00:18,710
this is time lapse photography of a

2
00:00:23,670 --> 00:00:20,960
dangerous weather condition called wind

3
00:00:26,150 --> 00:00:23,680
shear usually accompanied by intense

4
00:00:28,070 --> 00:00:26,160
downdrafts and heavy rain

5
00:00:30,470 --> 00:00:28,080
in recent years it has been linked to

6
00:00:32,630 --> 00:00:30,480
several aircraft disasters

7
00:00:34,709 --> 00:00:32,640
nasa has been investigating these

8
00:00:37,510 --> 00:00:34,719
hazards in hopes of understanding their

9
00:00:42,830 --> 00:00:37,520
effect on aircraft performance so that

10
00:00:48,389 --> 00:00:45,030
devised we're encountering a little bit

11
00:00:53,510 --> 00:00:51,029
altitude 400 feet okay we have wind

12
00:00:55,670 --> 00:00:53,520
shear warning a joint wind shear

13
00:00:58,310 --> 00:00:55,680

research program between nasa and the

14
00:01:00,389 --> 00:00:58,320
faa is concentrating on building

15
00:01:03,990 --> 00:01:00,399
avoidance procedures through pilot

16
00:01:06,950 --> 00:01:04,000
education with the use of simulators

17
00:01:09,510 --> 00:01:06,960
this is a computer model of wind shear

18
00:01:12,070 --> 00:01:09,520
notice the effect of the downdraft

19
00:01:13,830 --> 00:01:12,080
when a plane flies into this the winds

20
00:01:16,230 --> 00:01:13,840
can force it down

21
00:01:18,149 --> 00:01:16,240
nasa researcher dave hinton feels that

22
00:01:19,990 --> 00:01:18,159
simulator training is the key to

23
00:01:21,030 --> 00:01:20,000
teaching pilots how to deal with the

24
00:01:23,749 --> 00:01:21,040
problem

25
00:01:25,109 --> 00:01:23,759
for example this past summer july 11

26
00:01:26,870 --> 00:01:25,119
1988

27
00:01:28,789 --> 00:01:26,880
four aircraft encountered a microburst

28
00:01:30,310 --> 00:01:28,799
at denver staplan airport

29
00:01:31,590 --> 00:01:30,320
that was every bit as strong as the

30
00:01:34,390 --> 00:01:31,600
microburst that caused the crash at

31
00:01:36,310 --> 00:01:34,400
dallas fort worth in 1985. yet these

32
00:01:38,630 --> 00:01:36,320
four aircraft survived that encounter

33
00:01:40,069 --> 00:01:38,640
because of the training they'd received

34
00:01:41,910 --> 00:01:40,079
because of the training that the crews

35
00:01:43,830 --> 00:01:41,920
had received because of early

36
00:01:45,590 --> 00:01:43,840
recognition of the threat and early

37
00:01:48,230 --> 00:01:45,600
initiation of go around maneuver and

38
00:01:50,789 --> 00:01:48,240

proper escape maneuver also at langley a

39
00:01:53,429 --> 00:01:50,799
heavy rain simulator has been devised by

40
00:01:55,990 --> 00:01:53,439
a group of aerospace technologists

41
00:01:58,310 --> 00:01:56,000
at one end of the half-mile track is a

42
00:02:00,630 --> 00:01:58,320
tubular steel carriage designed

43
00:02:01,510 --> 00:02:00,640
originally to test tires and landing

44
00:02:03,749 --> 00:02:01,520
gear

45
00:02:07,190 --> 00:02:03,759
but specifically adapted to carry part

46
00:02:09,510 --> 00:02:07,200
of a full-scale aircraft wing section

47
00:02:11,910 --> 00:02:09,520
the wing is oriented to represent

48
00:02:13,750 --> 00:02:11,920
takeoff for landing settings used by

49
00:02:16,390 --> 00:02:13,760
commercial airliners

50
00:02:18,949 --> 00:02:16,400
water under extreme pressure launches

51
00:02:19,910 --> 00:02:18,959
the sled on a track at 150 miles per

52
00:02:22,710 --> 00:02:19,920
hour

53
00:02:25,350 --> 00:02:22,720
a field of over 1500 nozzles creates a

54
00:02:27,910 --> 00:02:25,360
windstorm for the wind

55
00:02:29,830 --> 00:02:27,920
in 10 seconds the test is over

56
00:02:31,589 --> 00:02:29,840
sensors on the wing measure its

57
00:02:34,630 --> 00:02:31,599
performance

58
00:02:37,190 --> 00:02:34,640
looking at the test again in slow motion

59
00:02:39,589 --> 00:02:37,200
an area of water turbulence can be seen

60
00:02:41,670 --> 00:02:39,599
over the front part of the wind

61
00:02:43,990 --> 00:02:41,680
wind tunnel studies have estimated that

62
00:02:47,030 --> 00:02:44,000
this turbulence causes a performance

63
00:02:48,790 --> 00:02:47,040

loss of 15 to 20 percent depending upon

64
00:02:51,830 --> 00:02:48,800
rain intensity

65
00:02:54,070 --> 00:02:51,840
aerospace technologist gaudi bezos we

66
00:02:56,470 --> 00:02:54,080
are here doing a large scale test to see

67
00:02:58,390 --> 00:02:56,480
if it's real is a realistic

68
00:03:00,710 --> 00:02:58,400
effect at large scale

69
00:03:03,190 --> 00:03:00,720
nasa's research on the effect of

70
00:03:05,509 --> 00:03:03,200
dangerous weather conditions preparing