1
00:00:00,570 --> 00:00:03,400
Music

2
00:00:03,400 --> 00:00:05,490
Stephen Frick/STS-122 Commander: Houston, Atlantis. Runway's in sight.

3
00:00:05,490 --> 00:00:08,350
Jim Dutton/Capcom: Copy field in site, Atlantis.

4
00:00:08,350 --> 00:00:12,240
Narrator: NASA's Kennedy Space Center in Florida and Edwards Air Force Base

5
00:00:12,240 --> 00:00:16,600
in California are well-known landing sites for the space shuttle fleet.

6
00:00:16,600 --> 00:00:21,250
But the agency has a roster of runways around the globe that could host a shuttle

7
00:00:21,250 --> 00:00:22,680
in an emergency.

8
00:00:22,680 --> 00:00:26,990
Long before a shuttle crew spots its intended landing target, mission controllers

9
00:00:26,990 --> 00:00:31,380
are closely monitoring the spacecraft, the crew and the weather at several landing sites

10
00:00:31,380 --> 00:00:34,970
before issuing a "go" for deorbit burn.

11
00:00:34,970 --> 00:00:38,690
Meanwhile, support crews are ready and eager to usher the astronauts in

12
00:00:38,690 --> 00:00:42,080
on the last leg of their journey, wherever that may be.

13
00:00:42,080 --> 00:00:45,420

The preferred finish line is the shuttle's home base at Kennedy

14
00:00:45,420 --> 00:00:51,460
a 15,000-foot-long runway that's about as wide as the length of a football field.

15
00:00:51,460 --> 00:00:54,480
Richard Merritt/Landing Support Manager: It's just awesome to see this big heavy,

16
00:00:54,480 --> 00:00:57,070
bulky thing coming out of the sky.

17
00:00:57,070 --> 00:00:59,460
And almost coming straight down like a brick.

18
00:00:59,460 --> 00:01:02,280
I always say it's like a brick and it just glides down and lands.

19
00:01:02,280 --> 00:01:06,480
Narrator: Construction of Kennedy's Shuttle Landing Facility wrapped up in 1976,

20
00:01:06,480 --> 00:01:10,670
but the site didn't host any shuttles until 1984.

21
00:01:10,670 --> 00:01:14,580
From the first shuttle mission in 1981, the primary landing site was

22
00:01:14,580 --> 00:01:18,540
Edwards Air Force Base, adjacent to NASA's Dryden Flight Research Center

23
00:01:18,540 --> 00:01:20,220
in California.

24
00:01:20,220 --> 00:01:24,300
Richard Merritt, a landing support manager with United Space Alliance,

25
00:01:24,300 --> 00:01:29,070
says Florida's marshy terrain is the main reason it took nearly a decade to move from

26
00:01:29,070 --> 00:01:31,180
one coast to another.

27
00:01:31,180 --> 00:01:33,830
Richard Merritt/Landing Support Manager: We were still a research and development

28
00:01:33,830 --> 00:01:35,980
type of aircraft/spacecraft.

29
00:01:35,980 --> 00:01:38,360
They just weren't comfortable with the target here.

30
00:01:38,360 --> 00:01:43,280
If you look from above and looking on the runway, each side has a lot of water.

31
00:01:43,280 --> 00:01:47,260
So, if you didn't make the runway here, you'd be talking to the alligators.

32
00:01:47,260 --> 00:01:50,950
Out in the desert, we landed on the dry lakebed.

33
00:01:50,950 --> 00:01:54,970
It's just lots of area, lots of room if you had some kind of problem

34
00:01:54,970 --> 00:01:56,990
and you didn't quite make the runway.

35
00:01:56,990 --> 00:01:59,640
So, I believe that's the difference. Much better target.

36
00:01:59,640 --> 00:02:03,110
Narrator: Columbia was the first shuttle to complete a mission when it touched down

37
00:02:03,110 --> 00:02:09,610
on that dry, expansive target April 14, 1981, ending STS-1.

38
00:02:09,610 --> 00:02:14,400

STS-1 Capcom: Welcome home Columbia. Beautiful, beautiful.

39
00:02:14,400 --> 00:02:17,550
John Young/STS-1 Commander: Do I have to take it up to the hangar, Joe?

40
00:02:17,550 --> 00:02:20,560
STS-1 Capcom: We're going to dust it off first.

41
00:02:20,560 --> 00:02:25,300
Narrator: As NASA's back-up site today, mainly because of Florida's

42
00:02:25,300 --> 00:02:30,870
often-finicky weather, Edwards has welcomed home more than 50 shuttle crews.

43
00:02:30,870 --> 00:02:35,570
The main difference in landing a shuttle at Kennedy and Edwards is all in the processing.

44
00:02:35,570 --> 00:02:37,560
Dean Schaaf/NASA Ground Operations Manager: The biggest difference here,

45
00:02:37,560 --> 00:02:41,610
we land and say three or four hours later, we're towing the vehicle into the orbiter

46
00:02:41,610 --> 00:02:43,560
processing facility, into a hangar.

47
00:02:43,560 --> 00:02:47,370
Out there, we tow it up to the mate-demate device, the MDD,

48
00:02:47,370 --> 00:02:51,290
and we have site-access platforms that lower down and around the orbiter

49
00:02:51,290 --> 00:02:52,950
and we do all the processing.

50
00:02:52,950 --> 00:02:58,950
It takes us seven days from landing to being ready to ferry after we attach the tailcone

51
00:02:58,950 --> 00:03:04,140
and back out and everything. It takes us seven, seven and a half days to do that.

52
00:03:04,140 --> 00:03:09,180
So, it's all done out in the elements and we have had rain, and hail and lightning.

53
00:03:09,180 --> 00:03:17,140
You know, all of those elements to work around out there at Dryden.

54
00:03:17,140 --> 00:03:20,800
Narrator: Kennedy and Edwards aren't the only options for the shuttle.

55
00:03:20,800 --> 00:03:24,210
There's also White Sands Space Harbor in New Mexico.

56
00:03:24,210 --> 00:03:27,760
It's where astronauts practice landing their Shuttle Training Aircraft

57
00:03:27,760 --> 00:03:32,910
because of its close proximity to NASA's Johnson Space Center in Houston.

58
00:03:32,910 --> 00:03:37,180
It's only been called upon one time to host a real shuttle landing, though:

59
00:03:37,180 --> 00:03:42,630
Columbia on the STS-3 mission on March 30, 1982.

60
00:03:42,630 --> 00:03:46,650
Merritt says it was tough to process the shuttle in the gypsum-filled desert

61
00:03:46,650 --> 00:03:49,260
and there's a reason it's called "white sands."

62
00:03:49,260 --> 00:03:52,030
Richard Merritt/Landing Support Manager: Parts of it looks like a moon with dunes.

63
00:03:52,030 --> 00:03:55,940

It's just pure, pure white, part of the desert is.

64
00:03:55,940 --> 00:03:58,700
And I guess some of its got growth and stuff, but when the wind blows

65
00:03:58,700 --> 00:04:03,230
it just kind of shifts it around. So it's a real fine powder, almost not quite like flour,

66
00:04:03,230 --> 00:04:05,800
but it's real fine and gets into everything.

67
00:04:05,800 --> 00:04:08,360
Narrator: After that first-and-only landing,

68
00:04:08,360 --> 00:04:13,630
NASA chose to relocate the processing turnaround area to minimize the wind.

69
00:04:13,630 --> 00:04:18,270
The end of a mission is not the only time NASA focuses on a landing site.

70
00:04:18,270 --> 00:04:21,800
If a shuttle were to encounter a problem during launch or entry,

71
00:04:21,800 --> 00:04:27,300
it could return to a transoceanic abort landing site, also called a TAL site.

72
00:04:27,300 --> 00:04:30,990
There are two in Spain and one in southern France.

73
00:04:30,990 --> 00:04:35,700
Other countries that once hosted TAL sites include the Republic of the Gambia,

74
00:04:35,700 --> 00:04:36,720
Senegal

75
00:04:36,720 --> 00:04:38,700
and Morocco.

76
00:04:38,700 --> 00:04:41,030
Dean Schaaf/NASA Ground Operations Manager: This reminds me of the site

77
00:04:41,030 --> 00:04:42,870
we used to have in Ben Guerir, Morocco.

78
00:04:42,870 --> 00:04:48,240
It was a landing strip out in the middle of the desert with a tower and very little else.

79
00:04:48,240 --> 00:04:53,520
And we built a building there and we used that for missions

80
00:04:53,520 --> 00:04:57,650
all the way up until the early 2000s when we closed that site

81
00:04:57,650 --> 00:04:59,840
and opened up Istres, France.

82
00:04:59,840 --> 00:05:03,150
Narrator: Glen Lockwood flies out to a TAL site before every launch

83
00:05:03,150 --> 00:05:06,100
and says even if it's a perfect day in Florida,

84
00:05:06,100 --> 00:05:09,590
bad weather elsewhere could be a showstopper.

85
00:05:09,590 --> 00:05:12,040
Glen Lockwood/NASA Ground Operations Manager: Our No. 1 concern here is safety.

86
00:05:12,040 --> 00:05:17,100
One site needs to be ready to support an orbiter landing for every launch.

87
00:05:17,100 --> 00:05:22,290
That's why we augment three TAL sites, because weather sometimes eliminates one site,

88
00:05:22,290 --> 00:05:24,710

perhaps two sites, sometimes all three TAL sites.

89
00:05:24,710 --> 00:05:28,620
If all three TAL sites are down because of weather, then we cannot launch.

90
00:05:28,620 --> 00:05:32,050
Narrator: In the Space Shuttle Program's nearly 30-year-history,

91
00:05:32,050 --> 00:05:36,940
a TAL site has never been needed, but that doesn't change the intensity of preparations

92
00:05:36,940 --> 00:05:38,290
for the team.

93
00:05:38,290 --> 00:05:41,510
Eileen Collins/STS-93 Commander: Houston, Columbia. We?re in the roll,

94
00:05:41,510 --> 00:05:43,930
we've got a fuel cell (inaudible), level one.

95
00:05:43,930 --> 00:05:46,640
STS-93 Capcom: Roger roll, Columbia. We're looking at it.

96
00:05:46,640 --> 00:05:48,280
Glen Lockwood/NASA Ground Operations Manager: Back in '99,

97
00:05:48,280 --> 00:05:50,490
it was Eileen Collins' mission.

98
00:05:50,490 --> 00:05:54,770
She was commander at that time and we had some technical problem

99
00:05:54,770 --> 00:05:56,180
with the vehicle upon launch.

100
00:05:56,180 --> 00:06:00,520
And so we were concerned that we might be needed, but we weren't, thankfully.

101
00:06:00,520 --> 00:06:04,290
We've never been used. And of course everybody when we go over there,

102
00:06:04,290 --> 00:06:07,700
we are basically programmed to be ready, but we are all hoping that

103
00:06:07,700 --> 00:06:10,020
we will not be needed.

104
00:06:10,020 --> 00:06:14,090
Narrator: As the Space Shuttle Program comes to an end, landing support team members

105
00:06:14,090 --> 00:06:19,830
are looking forward to getting their hands on each space shuttle for the last time.

106
00:06:19,830 --> 00:06:21,820
Richard Merritt, Landing Support Manager: It's excitement and anxiousness,