
WEST

1
00:00:00,000 --> 00:00:16,360
\h Music

2
00:00:16,360 --> 00:00:17,350
\h Welcome to the show.

3
00:00:17,350 --> 00:00:18,500
\h I'm your host, Damon Talley of

4
00:00:18,500 --> 00:00:20,410
\h NASA's Digital Learning Network.

5
00:00:20,410 --> 00:00:23,680
\h We're counting down to the scheduled launch of space shuttle Endeavour on its

6
00:00:23,680 --> 00:00:29,150
\h STS-126 mission and I'm here at NASA's Kennedy Space Center in Florida to

7
00:00:29,150 --> 00:00:31,180
\h take you behind the scenes.

8
00:00:31,180 --> 00:00:35,520
\h Endeavour is embarking on NASA's 27th flight to the International Space Station,

9
00:00:35,520 --> 00:00:40,330
\h orbiting more than 200 miles above us. During the 15-day mission, a well-trained

10
00:00:40,330 --> 00:00:44,640
\h astronaut crew will install several pieces of key hardware and conduct four

11
00:00:44,640 --> 00:00:47,300
\h spacewalks outside the station.

12
00:00:47,300 --> 00:00:51,710
\h More on that coming up. But first there's no better place on Earth to get a

13
00:00:51,710 --> 00:00:55,370

\h space shuttle ready to fly than right here at Kennedy Space Center.

14
00:00:55,370 --> 00:00:59,890
\h Let's find out what makes America's Spaceport so unique.

15
00:00:59,890 --> 00:01:04,460
\h Preparing any vehicle for a thundering ride into space is no easy task.

16
00:01:04,460 --> 00:01:09,720
\h It requires a prime location, massive facilities, just the right tools and equipment

17
00:01:09,720 --> 00:01:12,250
\h and of course, a stellar work force.

18
00:01:12,250 --> 00:01:14,810
\h For every one of NASA's human spaceflights,

19
00:01:14,810 --> 00:01:17,420
\h that place is Kennedy Space Center.

20
00:01:17,420 --> 00:01:23,010
\h Complex and challenging space missions begin here, amid this primitive Florida

21
00:01:23,010 --> 00:01:26,510
\h landscape, where eagles soar and alligators roam.

22
00:01:26,510 --> 00:01:31,380
\h Launch Complex 39 is made up of a collection of facilities custom-designed for

23
00:01:31,380 --> 00:01:34,700
\h preparing, launching and landing the space shuttle.

24
00:01:34,700 --> 00:01:38,730
\h The 3-bay Orbiter Processing Facility is where the space shuttle orbiters spend

25
00:01:38,730 --> 00:01:42,890
\h most of their time. Each bay provides access to every square inch of the

26
00:01:42,890 --> 00:01:46,410
\h spacecraft for the technicians who prepare it for flight.

27
00:01:46,410 --> 00:01:50,370
\h With its 8-acre footprint, the Vehicle Assembly Building, or VAB,

28
00:01:50,370 --> 00:01:54,920
\h is one of the largest buildings in the world. It dominates the Kennedy skyline and

29
00:01:54,920 --> 00:02:00,380
\h is visible across Florida's Space Coast. In this mammoth facility, the shuttle

30
00:02:00,380 --> 00:02:05,130
\h orbiter is joined with its external fuel tank and solid rocket boosters.

31
00:02:05,130 --> 00:02:11,380
\h The shuttle's twin launch pads, 39A and 39B, have a prime beachside location

32
00:02:11,380 --> 00:02:13,940
\h a perfect place to begin a mission.

33
00:02:13,940 --> 00:02:17,360
\h And when the shuttle comes home, its preferred landing site is the

34
00:02:17,360 --> 00:02:20,700
\h Shuttle Landing Facility just west of the VAB.

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00:02:20,700 --> 00:02:24,550
\h Longer and wider than commercial runways, it was specially designed for the

36
00:02:24,550 --> 00:02:28,230
\h high-speed landing of this unpowered, winged spacecraft.

37
00:02:28,230 --> 00:02:34,380
\h On STS-126, Endeavour is carrying a reusable logistics module called Leonardo.

38
00:02:34,380 --> 00:02:39,180

\h It's packed completely full of supplies and equipment that will allow the station to

39
00:02:39,180 --> 00:02:42,750
\h support a six-person crew starting next year. Let's take a look.

40
00:02:42,750 --> 00:02:47,090
\h There are extra crew sleeping bunks and more exercise equipment and a new

41
00:02:47,090 --> 00:02:50,550
\h addition to the station's regenerative life support system.

42
00:02:50,550 --> 00:02:53,620
\h The Water Reclamation System will recycle wastewater.

43
00:02:53,620 --> 00:02:57,630
\h It will work with the Oxygen Generation System to generate drinking water and

44
00:02:57,630 --> 00:02:59,760
\h breathable air for the station's residents.

45
00:02:59,760 --> 00:03:02,650
\h In addition to the slate of work planned inside the station,

46
00:03:02,650 --> 00:03:04,900
\h there also will be a lot of work outside.

47
00:03:04,900 --> 00:03:08,550
\h The mission will include four spacewalks to make repairs and upgrades to the

48
00:03:08,550 --> 00:03:11,300
\h station's two solar alpha rotary joints.

49
00:03:11,300 --> 00:03:15,150
\h These joints are essential, because they allow the station's massive

50
00:03:15,150 --> 00:03:18,140
\h power-generating solar panels to track the sun.

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00:03:18,140 --> 00:03:23,260
\h It's an ambitious mission with a full timeline but the seven-member flight crew

52
00:03:23,260 --> 00:03:24,410
\h is up to the task.

53
00:03:24,410 --> 00:03:27,490
\h Commander Chris Ferguson is making his second spaceflight.

54
00:03:27,490 --> 00:03:30,920
\h Pilot Eric Boe and Mission Specialists Steve Bowen and

55
00:03:30,920 --> 00:03:33,640
\h Shane Kimbrough are the flight's first-time flyers.

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00:03:33,640 --> 00:03:38,210
\h The lead spacewalker, Mission Specialist Heidemarie Stefanyshyn-Piper,

57
00:03:38,210 --> 00:03:42,060
\h flew with Ferguson on her first spaceflight, STS-115.

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00:03:42,060 --> 00:03:46,210
\h Mission Specialist Don Pettit is returning to the station he served as NASA's

59
00:03:46,210 --> 00:03:49,060
\h space station science officer on Expedition 6.

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00:03:49,060 --> 00:03:52,670
\h And Mission Specialist Sandy Magnus will relieve station

61
00:03:52,670 --> 00:03:56,660
\h Flight Engineer Greg Chamitoff, becoming part of Expedition 18.

62
00:03:56,660 --> 00:04:01,060
\h Now, when a shuttle returns from space, a lot of work goes into refurbishing and

63
00:04:01,060 --> 00:04:03,350

\h repairing it before it's ready to fly again.

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00:04:03,350 --> 00:04:07,350
\h Space shuttle Endeavour's most recent mission was STS-123

65
00:04:07,350 --> 00:04:11,830
\h back in March. I recently visited Kennedy's Orbiter Processing Facility to find out

66
00:04:11,830 --> 00:04:16,010
\h how a highly skilled team of shuttle technicians spent the past few months

67
00:04:16,010 --> 00:04:19,550
\h preparing Endeavour for STS-126.

68
00:04:19,550 --> 00:04:23,150
\h I'm here inside the Orbiter Processing Facility with Ken Tenbusch,

69
00:04:23,150 --> 00:04:24,410
\h NASA flow director here at the Kennedy Space Center.

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00:04:24,410 --> 00:04:25,810
\h Ken, nice to see you today.

71
00:04:25,810 --> 00:04:27,580
\h Hi, Damon. Nice to meet you.

72
00:04:27,580 --> 00:04:29,600
\h Ken, can you tell us exactly, what is shuttle flow?

73
00:04:29,600 --> 00:04:35,470
\h Shuttle flow is taking that vehicle from the time that it has landed.

74
00:04:35,470 --> 00:04:37,500
\h It's rolled over here to the Orbiter Processing Facility and all the processing here,

75
00:04:37,500 --> 00:04:41,700
\h along with the external tank processing that's happening at the same time over in

76
00:04:41,700 --> 00:04:45,780
\h the Vehicle Assembly Building. Then, the solid rocket booster processing that's

77
00:04:45,780 --> 00:04:48,790
\h going on, as well the stacking, and getting that all ready and checked out

78
00:04:48,790 --> 00:04:53,100
\h and then bringing all of those components together in one overall integrated

79
00:04:53,100 --> 00:04:57,430
\h shuttle vehicle. Then, once you're at that point you do a checkout in the Vehicle

80
00:04:57,430 --> 00:05:03,020
\h Assembly Building. Roll that out to the pad. Do all the checkout there. Load the

81
00:05:03,020 --> 00:05:07,420
\h vehicle. Get it ready for flight. And then you basically a processing flow, from

82
00:05:07,420 --> 00:05:10,150
\h start to finish from that landing all they way on through to launch.

83
00:05:10,150 --> 00:05:14,400
\h Now this is space shuttle Discovery behind us. Space shuttle Endeavour is

84
00:05:14,400 --> 00:05:17,340
\h already out at the pad. What happens to an orbiter in this

85
00:05:17,340 --> 00:05:19,610
\h Orbiter Processing Facility?

86
00:05:19,610 --> 00:05:22,970
\h In the Orbiter Processing Facility, what they do is, from the time that the mission

87
00:05:22,970 --> 00:05:26,540
\h is complete, they land here over at the Shuttle Landing Facility. They roll it over

88
00:05:26,540 --> 00:05:29,350

\h here in the Orbiter Processing Facility, and then they do all of that de-

89
00:05:29,350 --> 00:05:33,040
\h configuration work that they need to do. Checkout of all the systems make sure

90
00:05:33,040 --> 00:05:37,260
\h that they are operating normally. Taking a lot of doors off. Looking at a lot of

91
00:05:37,260 --> 00:05:41,080
\h different areas. Tiles need to be removed there's a lot of tile that's damaged.

92
00:05:41,080 --> 00:05:44,450
\h And then what you're doing is, you take all those components apart, do all the

93
00:05:44,450 --> 00:05:49,430
\h checkout, and then you start putting the pieces back together again. At that point,

94
00:05:49,430 --> 00:05:53,020
\h you're going in and you're loading up certain things back into the payload bay.

95
00:05:53,020 --> 00:05:57,570
\h You're putting things back into the forward compartment. Aft compartment, you

96
00:05:57,570 --> 00:06:01,260
\h may have had to change out an auxiliary power unit, or something along those

97
00:06:01,260 --> 00:06:04,010
\h lines. But then, what you're doing is, once you're complete will all of that work,

98
00:06:04,010 --> 00:06:07,440
\h and you've got all the engines in the engines have to be installed. Doing all the

99
00:06:07,440 --> 00:06:13,680
\h closeouts, back of each of those particular areas, do a structural leak check

100
00:06:13,680 --> 00:06:18,300
\h when you're all finished. A weight CG (center of gravity) make sure that's all

101
00:06:18,300 --> 00:06:21,960
\h set up properly. Then you're ready to bring the orbiter transporter in. Mate that to

102
00:06:21,960 --> 00:06:25,990
\h the orbiter transporter ready to rollover then to the Vehicle Assembly Building.

103
00:06:25,990 --> 00:06:28,450
\h Alright, so we've rolled over to the Vehicle Assembly Building, where we have

104
00:06:28,450 --> 00:06:31,260
\h some other components of the space shuttle that need to be connected, correct?

105
00:06:31,260 --> 00:06:35,090
\h Correct. Exactly. The orbiter comes over. At that point, you know, they've been

106
00:06:35,090 --> 00:06:38,750
\h processing in the Vehicle Assembly Building with the external tank and solid

107
00:06:38,750 --> 00:06:43,390
\h rocket boosters. So at that point the orbiter is lifted and then mated to the

108
00:06:43,390 --> 00:06:48,610
\h external tank. Then at that point they've got the vehicle all assembled one overall

109
00:06:48,610 --> 00:06:54,160
\h shuttle vehicle. Then you're, all of that is on top of the mobile launcher platform.

110
00:06:54,160 --> 00:06:58,170
\h So you've got that assembly all together. You can run a complete, overall

111
00:06:58,170 --> 00:07:02,590
\h functional check, from start to finish, of that integrated assembly. Then you're

112
00:07:02,590 --> 00:07:07,080
\h ready to bring the crawler-transporter in. Hydraulically crank up the crawler-

113
00:07:07,080 --> 00:07:10,640

\h transporter, and then roll out that entire assembly back out to the pad for that

114
00:07:10,640 --> 00:07:14,650
\h final bit of processing and readiness before you actually go to launch.

115
00:07:14,650 --> 00:07:17,660
\h So those crawlers move the shuttles around. Didn't we have to do a rollaround?

116
00:07:17,660 --> 00:07:19,900
\h What is a rollaround?

117
00:07:19,900 --> 00:07:23,840
\h What we had to do, is we had to actually rollout to Pad B and process out at Pad

118
00:07:23,840 --> 00:07:29,290
\h B, while they were ready to process the orbiter for STS-125 over at Pad A. We

119
00:07:29,290 --> 00:07:35,140
\h were their rescue mission, is the way we say it. We had to be ready to launch

120
00:07:35,140 --> 00:07:39,150
\h within seven days of their launch because they were not going to station. They

121
00:07:39,150 --> 00:07:42,310
\h didn't have the benefit of getting those resources from station. So we had to be

122
00:07:42,310 --> 00:07:46,850
\h ready to launch quickly. After they were to launch, we were going to rollaround to

123
00:07:46,850 --> 00:07:50,810
\h Pad A and then finish off the rest of our particular processing flow and then get

124
00:07:50,810 --> 00:07:52,330
\h that ready for launch in November.

125
00:07:52,330 --> 00:07:55,790
\h Where are you on launch day? And what is it like to see your orbiter launch?

126
00:07:55,790 --> 00:08:00,710
\h I am in the Launch Control Center in Firing Room 4, in this particular case for this

127
00:08:00,710 --> 00:08:06,150
\h launch that's upcoming. As far as the feeling it's just a feeling of jubilation. You

128
00:08:06,150 --> 00:08:10,210
\h know, I think about all of the work that went on, as far as putting that vehicle

129
00:08:10,210 --> 00:08:13,240
\h together and then I get to see it in the culmination of a beautiful launch. So just a

130
00:08:13,240 --> 00:08:15,570
\h very exciting moment all the way around.

131
00:08:15,570 --> 00:08:18,950
\h Well Ken, thank you for your time today and good luck with the launch.

132
00:08:18,950 --> 00:08:20,280
\h Thank you, Damon. Appreciate it sir.

133
00:08:20,280 --> 00:08:24,300
\h That's our show. You can follow the launch countdown live.

134
00:08:24,300 --> 00:08:30,620
\h Just tune in to NASA TV or visit www.nasa.gov/shuttle

135
00:08:30,620 --> 00:08:32,380
\h for the official launch blog.

136
00:08:32,380 --> 00:08:36,740
\h Or check all the action during our live launch webcast on