
Ops Mission Mgr

1
00:00:01,120 --> 00:00:12,000
\h Five, four, three, two, one, main engine start
and liftoff!

2
00:00:12,000 --> 00:00:20,000
\h Music

3
00:00:20,000 --> 00:00:25,370
\h Why do we send anything into space?

4
00:00:25,370 --> 00:00:30,460
\h Well, it turns out sending spacecraft into space has a major impact on your life,

5
00:00:30,460 --> 00:00:32,830
\h and in ways you may not have realized.

6
00:00:32,830 --> 00:00:36,870
\h You're starting on a fascinating tour behind the scenes of NASA's Launch

7
00:00:36,870 --> 00:00:41,330
\h Services Program. Have you ever wondered how we're able to monitor the

8
00:00:41,330 --> 00:00:45,970
\h weather and other forces at work on Earth? And how much effort did it really take

9
00:00:45,970 --> 00:00:51,860
\h to get the Mars Exploration Rovers Spirit and Opportunity safely to the red planet?

10
00:00:51,860 --> 00:00:55,760
\h These science and earth exploring missions all begin the same way--as a

11
00:00:55,760 --> 00:01:00,450
\h carefully designed and built spacecraft attached to a rocket and launched into

12
00:01:00,450 --> 00:01:07,450
\h space from one of NASA's two launch sites.
None of this happens overnight. Every mission is a product of years of

13
00:01:07,450 --> 00:01:13,410
\h challenging work. Every spacecraft must be designed, developed, built, tested

14
00:01:13,410 --> 00:01:20,670
\h and prepared for launch. This work takes place at Universities and NASA centers all over the country.

15
00:01:20,670 --> 00:01:23,890
\h So, how do these engineering marvels get to the launch site?

16
00:01:23,890 --> 00:01:30,030
\h And once they get there, who puts on the finishing touches to prepare the spacecraft for flight?

17
00:01:30,030 --> 00:01:34,820
\h Well, spacecraft are shipped either fully put together, or in sections.

18
00:01:34,820 --> 00:01:39,610
\h They arrive by truck, or by airplane to the Kennedy Space Center in Florida or

19
00:01:39,610 --> 00:01:42,750
\h Vandenberg Air Force Base in California.

20
00:01:42,750 --> 00:01:48,980
\h Once there, the spacecraft heads to a processing facility where engineers get them ready for launch.

21
00:01:48,980 --> 00:01:53,140
\h The processing facility is a cleanroom environment, and in the space business,

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00:01:53,140 --> 00:01:57,240
\h the cleanroom goes a lot further than sweeping the floor!

23
00:01:57,240 --> 00:02:00,430
\h In fact, everyone working on the spacecraft in the cleanroom has to put on a

24
00:02:00,430 --> 00:02:05,880
\h special suit, affectionately known as a "bunny suit," over their own clothing.

25
00:02:05,880 --> 00:02:08,620

\h They have to tape their jewelry to their skin to keep it from getting loose in the

26
00:02:08,620 --> 00:02:16,650
\h work area, cover their facial hair and tie a string around their glasses so they don’t accidentally come off

27
00:02:16,650 --> 00:02:22,200
\h It sounds extreme, but there's a good reason: The spacecraft and its delicate parts

28
00:02:22,200 --> 00:02:24,600
\h must stay as clean and bacteria-free as possible.

29
00:02:24,600 --> 00:02:30,300
\h When the spacecraft is finally ready for launch, it starts the last leg of its journey on Earth.

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00:02:30,300 --> 00:02:36,870
\h The spacecraft is tucked inside a protective fairing and then taken to the launch pad, where it is added t

31
00:02:36,870 --> 00:02:40,940
\h NASA's Launch Services Program, operating from the Kennedy Space Center in Florida,

32
00:02:40,940 --> 00:02:44,860
\h uses many types of space vehicles.

33
00:02:44,860 --> 00:02:49,700
\h The LSP engineers help choose the type of rocket that is best suited to the weight and the destination o

34
00:02:49,700 --> 00:02:52,880
\h spacecraft and the mission's goals.

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00:02:52,880 --> 00:02:58,900
\h Most rockets lift off vertically; many of us have seen rockets that sit on a launch pad.

36
00:02:58,900 --> 00:03:03,690
\h When the countdown clock gets to zero, the engines ignite and send the rocket on its way.

37
00:03:03,690 --> 00:03:06,900
\h But there's also another more unusual type of rocket.

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00:03:06,900 --> 00:03:11,180
\h It's small enough to attach to the underside of a commercial airplane.

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00:03:11,180 --> 00:03:16,370
\h The airplane flies to just the right place and the right altitude, then drops the rocket,

40
00:03:16,370 --> 00:03:20,610
\h which lights its own engine and sends the spacecraft into space.

41
00:03:20,610 --> 00:03:24,980
\h As you can see, launching a space mission is no small job.