

## Boeing Starliner successfully completes pad abort test

### Crew escape system test is critical milestone ahead of first crewed launch

**WHITE SANDS, N.M., Nov. 4, 2019** – Boeing [NYSE: BA] today cleared a crucial test on the way to returning the United States to human spaceflight launch capabilities by completing a successful pad abort test of the CST-100 Starliner.

During the two-minute test designed to simulate a launch pad emergency, an uncrewed Starliner spacecraft lifted off under its own power from a test stand at the U.S. Army's White Sands Missile Range in New Mexico. The vehicle was able to demonstrate the proper performance of numerous integrated systems that would be needed to successfully propel the capsule away from its Atlas V launch vehicle at any point during the ascent.

"The test team and spacecraft performed flawlessly," said Starliner Program Manager John Mulholland. "Emergency scenario testing is very complex, and today our team validated that the spacecraft will keep our crew safe in the unlikely event of an abort."

At T-0 in the countdown, Starliner fired its four launch abort engines (LAEs) and several orbital maneuvering and attitude control (OMAC) thrusters. With 190,000 pounds of thrust, the spacecraft quickly pushed up and away from the test stand, showcasing how fast the system can whisk crews away from danger if necessary. The vehicle flew nearly a mile in just under 20 seconds before deploying its forward heat shield and parachutes.

Nearly 34 seconds into the test, the service and crew modules separated. As the crew module descended slowly to a safe landing under the parachutes, the service module continued to free fall as planned.

Just over a minute into the test, the vehicle's base heat shield separated, allowing the Starliner spacecraft's air bags to deploy and inflate in preparation for landing. The crew module touched down 95 seconds after the abort engines fired.

"We've tested all these systems individually, so we know the propulsion system fires at the intended levels, and we know the parachutes can support the vehicle and safely slow it down, but the real test is making sure those systems can perform together. That's when you know these systems are ready to fly people," said Boeing's Pad Abort Test Flight Director Alicia Evans.

Over the next 24 hours, Starliner's crew module will be recovered for evaluation and analysis. Conducting this test over ground helps to preserve the crew module for reuse, and Boeing will use the data from this test to further validate system performance during nominal landing operations. Starliner is designed to be the first American-made orbital crew capsule to land on land, which will help make the crew modules reusable up to 10 times.

Boeing is committed to providing safe and reliable transportation services to low Earth orbit destinations including the International Space Station, where ongoing research improves life on Earth, supports a growing commercial industry, and enables long-duration missions back to the moon and on to Mars.

Starliner's pad abort test is a critical milestone ahead of flying Boeing and NASA astronauts to the orbiting laboratory on Starliner's Crew Flight Test, and for flying operational missions to the station for NASA in the near future.

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