The Pad Abort 1 flight test was a launch of the abort system designed for the Orion crew vehicle. The test occurred on May 6th at the U.S. Army’s White Sands Missile Range near Las Cruces, NM.
Orion Launch Abort System

The LAS provides escape capability in case of an emergency on the launch pad or during the first few minutes of ascent.
Crew Module
- Provides safe habitat for crew
- Allows reentry and landing as a stand alone module
- ISS “lifeboat” capability

Launch Abort System
- Safely removes the crew from launch vehicle in an emergency
- Protects crew module from atmospheric loads and heating
- Jettisons after successful pad operation and first stage flight

Service Module
- Supports crew module from launch through separation
- Accommodates unpressurized cargo or mission science equipment

Spacecraft Adapter
- Provides connection to launch vehicle
- Protects Service Module components
The test involved three motors: an abort motor, an attitude control motor, and a jettison motor.
The **abort motor** produced a momentary half-million pounds of thrust to propel the crew module away from the pad. It burned for approximately six seconds, with the highest impulse in the first 2.5 seconds. The crew module reached a speed of approximately 445 mph in the first three seconds, with a maximum velocity of 539 mph, in its upward trajectory to about 1.2 miles high.
The **attitude control motor** fired simultaneously with the abort motor and steered the vehicle using eight thrusters producing up to 7,000 pounds of thrust. It provided adjustable thrust to keep the crew module on a controlled flight path and reorient the vehicle as the abort system burned out.
The jettison motor, the only motor of the three that would be used in all nominal rocket launches, pulled the entire launch abort system away from the crew module and cleared the way for parachute deployment and landing. After explosive bolts fired and the jettison motor separated the system from the crew module, the recovery parachute system deployed. The parachutes guided the crew module to touchdown at 16.2 mph (24 feet per second), about one mile from the launch pad.
Orion Launch Abort System

The LAS engineering mock-up (termed the LAS Pathfinder) was used to prepare for May's Pad Abort Test. It is a high-fidelity reproduction of an operational LAS, and was used to verify ground handling and assembly of the actual system. The LAS Pathfinder will be stopping at the Denver Museum of Nature & Science on Tuesday, September 28 and Wednesday, September 29; DMNS is the first stop en route to an appearance at the US Science & Engineering Festival on the National Mall in Washington, D.C.