

Northrop Grumman Validates Sentinel Missile Design Through Rigorous Wind Tunnel Testing Campaign

Live-fire results with scaled missiles correlate with digital models, offering further proof of design maturity

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ROY, Utah. – Feb. 16, 2023 – Northrop Grumman Corporation (NYSE: NOC) successfully completed a series of wind tunnel tests of the LGM-35A Sentinel intercontinental ballistic missile (ICBM). Using scaled models of the vehicle, stressed under environments from sub to hypersonic speeds, the robust test campaign validated digital modeling and simulations and proved design maturity of the missile.

“This wind tunnel campaign is an opportunity to put our digitally engineered designs to the test, under conditions that mimic a missile launch,” said Sarah Willoughby, vice president and program manager, Sentinel, Northrop Grumman. “Predictions from the modeling correlated with the testing results, giving us confidence in our model-based engineering approach. Data from these tests will inform future engineering decisions as we mature the design and continue on a path to deliver this critical capability to the Air Force.”

Wind tunnel testing is a key early step in any missile development program because it determines how a vehicle will perform during flight. A team of engineers created seven comprehensive test campaigns, each with a unique set of requirements, to measure how the missile would respond to various atmospheric, load and speed conditions. Tests simulated everything from firing the missile, to stage separation and various flight maneuvers. The team is now updating models to enable full scale predictive environments for the development of Sentinel flight hardware.

“Tests were conducted at industry and government-run facilities across the U.S. in under a year,” said Willoughby. “This is an extremely complex effort proving the value of digital engineering in helping us move to the next phase with certainty.”

The U.S. Air Force’s Sentinel weapon system is a critical modernization of the current land-based leg of the U.S. nuclear triad, replacing the Minuteman III ICBM system that has been in service for more than 50 years. The program represents advancements in technology with the use of digital engineering, advanced tooling, and a modular, open-architecture approach.

Northrop Grumman is leading a nationwide team that includes companies from across the defense, engineering and construction industries as part of the Sentinel engineering and manufacturing development contract. Overall, the Sentinel program will involve over 10,000 people across the U.S. directly working on this vital national security program. For more information, please visit: www.northropgrumman.com/sentinel.

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