

Hypersonic Weapons System Lethality Modeling Validation

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Author Note: This team, originating from West Point, New York, is composed of Cadet Donia Nichols, Cadet DeAdre Harvey, Cadet Bethany Nunnery, and Cadet Lucas Weiland. All members are Systems Engineering track students who completed three intensive systems engineering courses at the United States Military Academy. The team is working with a group from Lockheed Martin Corporation, King of Prussia, Pennsylvania consisting of Erica Harp, Erick Tapia-Ontiveros, and Christopher Kahn. Finally, all parties would not have been able to complete their work without the help of their head advisor and instructor.

Abstract: Hypersonic weapons deliver long range undetected rapid global strike capabilities against tactical targets by travelling at speeds at least as fast as Mach Five and provide a marked advantage to countries that develop them. Lockheed Martin Corporation created an optimization tool in Excel for the U.S. Army that considers mission parameters to model the best combination of hypersonic weapons systems to successfully complete mission while minimizing cost. Through the systems design process, we found that time requirements were critical to the development of the Army's hypersonic weapon program. We improved the tool by adding a function through interpolation in Excel Solver that allows the user to dictate the time to completion of the mission. The project resulted in improved modelling accuracy and prioritization for the development of hypersonic weapons systems.

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