



Engineering Analysis

At TriVector, we are known for our extensive engineering analyses *experience* and our superior results. We have successfully *performed* a wide range of complex engineering analyses for space, missile, aviation, and meteorology applications in support of our NASA, Army, Missile Defense Agency, NOAA, and commercial customers. From concept design to post production to mission execution, our engineering analyses results provide immense *value* to our customers.

- ▶ Radar and Missile System Performance
- ▶ Concept Vehicle Performance
- ▶ Space Environments and Flight
- ▶ Unmanned Systems Analysis of Alternatives for Missions
- ▶ Software Design, Data Timing, and Airworthiness
- ▶ Thermal Space Environment
- ▶ Guidance, Navigation, and Control
- ▶ Oceanography and Meteorology
- ▶ Quality and Reliability Analysis
- ▶ Production and Additive Manufacturing

Our Customers

- ▶ MDA: GMD (MOKV, RKV)
- ▶ NASA: MSFC (SLS)
- ▶ NOAA: Unmanned Aircraft Systems, OWAQ
- ▶ U.S. Army: AMRDEC (AED, ED, S3I, WDI),
PEO Aviation (UAS),
PEO Missiles & Space (CMDS, JAMS)
- ▶ Commercial Energy and Space Programs
- ▶ International Education Programs

Our People

- ▶ 65% 25+ Years Experience
- ▶ 49% Engineers
- ▶ 42% Advanced Degrees
- ▶ 25% Subject Matter Experts

Delivering Engineering Excellence... Ensuring Technical Performance



Timing Analyses for NASA's Space Launch System (SLS) Avionics System Integration Lab (SIL)

The SLS requires tight time synchronization and data correlation among the dozens of avionics subsystems distributed throughout the 300-foot rocket. The Avionics SIL provides an extensive HWIL test environment for the avionics and software used to control the rocket throughout flight. TriVector led the complex analyses of time synchronization and data latencies from SIL testing. We established rigorous test criteria, procedures and analysis tools, and conducted early timing analyses. We identified problems early in the test cycle allowing for prompt resolution, educated stakeholders on time correlation impacts, and refined test solutions. TriVector continues to refine these test and analysis procedures to satisfy pending verification of critical timing requirements in preparation for flight certification.

NOAA Office of Weather and Air Quality (OWAQ), Strategic Applications in the Atmospheric Sciences

TriVector provides liaison and strategic expertise to leading edge weather predictive capability research projects for the NOAA Office of Oceanic and Atmospheric Research and OWAQ. Within NOAA and its interagency partners, we coordinate subject matter experts and strategize with programmatic leadership on topics ranging from preparation of the weather, water, and climate enterprise for exascale computing; to implementation of common physics across numerical model suites; to research, development, and transition of technologies for support of DOD and National Weather Service operational missions. TriVector's experts support the interagency National Earth System Prediction Capability and OWAQ Sub-seasonal to Seasonal portfolio; and directly influence disciplines key to enhancing our economy, national security, and resilience.



Cruise Missile Defense Program Office Quality & Reliability Engineering

The CMDS PO Portfolio includes: the Indirect Fire Protection Capability (IFPC) Increment 2-I, Stinger, Avenger, Maneuver-Short Range Air Defense (M-SHORAD), Sentinel Radar, and the Expanded Mission Area Missile (EMAM). TriVector provides quality and reliability expertise to enhance CMDS systems. Working closely with CMDS PO experts, TriVector assists in the establishment of sound product assurance practices, verification of performance requirements, and determining courses of action based on quality, reliability and program metrics. From restarting Stinger and Avenger production to establishing new systems such as EMAM, TriVector supports the CMDS PO in ensuring high quality, reliable advanced capability products are developed and delivered to the warfighter for successful mission completion.

AMRDEC Weapons Development and Integration Directorate DAEDALUS Team Optimization

The AMRDEC established the Daedalus "think tank", consisting of a cross section of mid-level engineers/scientists, to solve cross-organizational problems facing today's Army. TriVector assists the AMRDEC by providing subject matter expertise (SME) in organizational and teaming optimization. Our SME has provided team training, mentored Daedalus team members, and gathered/analyzed team dynamics and execution data to improve the initiative. As a result, TriVector has directly impacted Daedalus in advancing its goals of promoting creative thinking, distributing corporate knowledge, and elevating cross-AMRDEC teamwork. To date, the Daedalus project has resulted in solution patents, seed money for novel solution development, and redirection of management goals and strategy.



Points of Contact: Marc Verhage (256) 603-0959 | Tim Kauffman (256) 509-5372

TriVector Services Inc. | 4245 Balmoral Drive, Suite 306 | Huntsville, AL 35801 | (256) 898-3430 | info@trivector.us