



Systems Engineering and Integration

At TriVector, our SE&I experts are recognized for their depth of *experience* in developing and implementing streamlined, technically-robust life cycle SE&I programs...for their superior *performance* in executing SE&I technical functions...and for providing exceptional *value* to our customers.

- ▶ *Model Based Systems Engineering*
- ▶ *Integrated Lifecycle SE&I Planning and Execution*
- ▶ *Concept of Operations Definition*
- ▶ *Interface Requirements and Design Definition*
- ▶ *Risk Management*
- ▶ *Verification & Validation (V&V) Planning and Execution*

Our People

- ▶ *60% 25+ Years Experience*
- ▶ *56% Engineers*
- ▶ *21% Senior Systems Engineers*
- ▶ *30% Advanced Degrees*

Our Current Customers

- ▶ *U.S. Army*
- ▶ *MDA*
- ▶ *NASA*
- ▶ *NOAA*
- ▶ *Commercial Space*

Experience ▶ Performance ▶ Value


TriVector
SERVICES INC.

Solving Critical Customer Challenges...Delivering Superior Technical Solutions.



GMD GS 7B Model-Based Systems Engineering (MBSE)

The Missile Defense Agency (MDA) Ground-based Midcourse Defense (GMD) needed a GS 7B functional architecture, a Systems Requirement Review entrance criterion. Their current specification addressed roughly half of the required GS 7B functionality. TriVector developed a MBSE approach to perform in-depth functional analysis of the required GS 7B system behavior. We identified gaps between the functional architecture and the requirements, and provided candidate language to ensure a complete trace from specification to the model. We delivered a complete functional architecture model, an Architecture Description Document, and a GS 7B Operations Concept ahead of schedule to support their successful SRR. We also developed an end-to-end engagement scenario executable model to highlight the GS 7B system requirements in-view and the GS 7B capability upgrades.

Commercial Space Air Launch System IRD/ICD

Stratolaunch, a \$2B, complex commercial space Air Launch System (ALS), required robust, standardized SEI processes to integrate the ALS Launch Vehicle Payload, Air Support Equipment Pylon, and Carrier Aircraft – all from different contractors. We developed and executed solution interface block diagrams, interface requirements documentation (IRD), and interface control documentation (ICD) to address systems interface development, design, analysis, and documentation. By consolidating these products into a one document and one process approach we provide a simple, efficient control management process for future interface changes. Currently, we use the IRD/ICD as a key SEI Interface management tool for evaluating Stratolaunch payload options and payload design solutions.

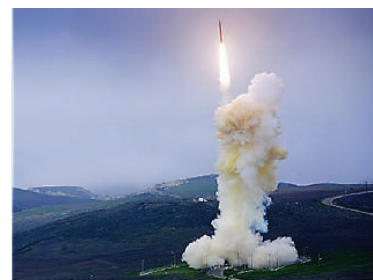


NASA MSFC Streamlined Systems Engineering (SE) Process

TriVector streamlined the NASA Marshall Space Flight Center (MSFC) SE Policy MPR 7123 and related processes to ensure an efficient, cost effective, technically rigorous SE program. Our Tiger Team evaluated MSFC's 17 core SE processes identifying current state, risks, gaps, and lower level "How To" content, processes, and products. Through Tabletop Assessments, we defined optimized processes while improving technical rigor and validating SE requirements. We assembled 60+ SE SMEs to gain input and concurrence on revisions, and benchmarked NASA, DoD, and International Standards for Best Practices. We developed the modified SE policy and definitive NASA SE Handbook; gained senior management approval; and trained SE personnel. We achieved all customer requirements – reducing "shall" statements by 84%; thereby streamlining SE execution – all within budget and schedule.

MDA GMD Robust Homeland Defense SRR

TriVector supports the design and implementation of a government-owned SE&I organization to bring the complex Ground Midcourse Defense (GMD) capability from concept through a successful Preliminary Design Review. To achieve success, we rely on our deep technical SE&I expertise; sound engineering practice, processes, and procedures; and our successful past performance in major program SE&I applications for NASA, NOAA, and Commercial Launch Systems. As a result, the GMD SE&I Team is thriving with TriVector engineers serving in key technical roles and, in April 2017, we successfully led the implementation and execution of the Robust Homeland Defense SRR.



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