

Summit Engineering Group Capabilities and Projects



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Now Celebrating 10 years !

Core Capabilities

- **Systems Engineering**
- **Cost/Price Analysis**
- **Cost/Effectiveness Modeling**
- **Business Analysis**

Life Cycle Cost Estimation

- Estimating the cost implications of developing, procuring, operating, maintaining and disposing of entire system or selected subsystems
 - Aircraft and Unmanned Aerial Vehicles (UAVs)
 - Missiles and Munitions
 - Ships, Submarines and Unmanned Underwater Vehicles (UUVs)
 - Electronics [examples are radar, EO/IR, EW, ECM, sonar, and Command, Control, Communication, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR) elements]
 - Satellites
 - Ground/Surface Equipment and Facilities

Key Benefits

- Understanding Total Ownership Cost (TOC)
- Firm foundation for evaluating costs of alternative procurement strategies
- Key component for conducting cost/effectiveness analysis
- Cost tied to a defined configuration and set of assumptions

Cost / Effectiveness Analyses

- System architecture alternatives
- Cost Analysis Requirements Descriptions (CARDs)
- Technical Description Documents (TDDs)

Key Benefits

- Ties costs to operationally relevant metrics to assess value
- Bridges cost models to operational models through common assumptions about capabilities and configurations
- Forces disciplined discussion and coordination between cost analysts and engineers

Economic Analyses & Modeling

- Acquisition & Deployment Options
- Cost as an Independent Variable (CAIV) analysis
- Cost / Price Relationships
- Quick reaction cost

Key Benefits

- Disciplined approach provides an audit trail on key cost assumptions and cost drivers
- Electronic data format (spreadsheets and databases) facilitates excursions on baseline data

Risk Assessments

- Modeling technical, performance, and LCC implications
- Technology insertion planning
- Return on Investment (ROI) analysis
- Assessment of affordability

Key Benefits

- Bounds cost estimates and quantifiable confidence intervals
- Helps decision-makers understand key cost drivers and their associated risk implications
- Highlights technical risks to both cost and schedule
- Highlights performance requirements that can or should be relaxed (subject to operational risk considerations) to maintain cost / schedule

Source Selection Support

- Pre-Solicitation planning
- Technical data development
- Cost proposal evaluation
- Development of award documentation
- Post-award implementation

Key Benefits

- Explore system cost-to-attribute relationships for 'bid to win' strategies
- Timely, confidential development of source selection materials
- Comprehensive analysis and dynamic cost model development to highlight negotiating opportunities
- Thorough award documentation that is consistent and unbiased

Counter-MANPADS Program

Description

- Congressionally directed Department of Homeland Security program to develop and implement a plan for protecting commercial aircraft from the Man Portable Air Defense System (MANPADS) threat
 - Demonstrate proven military technology in the commercial aviation environment
 - System development, demonstration, and evaluation program
- SEG was Lead Cost Estimator for the Government/SETA team



Tasks Performed

- Developed SETA LCC estimates
- Reviewed contractor LCC estimates
- Developed inputs for DHS planning, programming, and budgeting activities
- Led guidance and review of the Manufacturing Rate Assessments
- Participated in and provided feedback on all formal program reviews (PDR, CDR, etc.)
- Supported contract negotiation sessions and drafted Phase III Solicitation

Deliverables

- Wrote key cost chapter in the final Phase II report for Congress
- Developed initial “Life Cycle Cost (LCC) Estimate for the Department of Homeland Security (DHS) Counter-MANPADS (CM) Program” document. This 300+ page document discussed the procedures, ground rules and assumptions, data, etc. that underpin the cost estimates developed across several deployment options profiles.

Orbital Express (Satellite) Program

Description

- Orbital Express is a Defense Advanced Research Projects Agency (DARPA) program aimed at demonstrating fully autonomous on-orbit satellite servicing capabilities
 - Fully-autonomous rendezvous capability
- SEG provided cost and systems engineering expertise while also performing other program management functions (Source Selection support, Budgeting, Business Case Analyses, etc.)



Tasks Performed

- Developed the Demonstration Phase cost estimates and guided contractor LCC estimating activities
- Evaluation of estimate at completion (EAC) projections
- Supported a formal business case analyses and special studies
- Assisted in the Source Selection efforts
 - Drafted the Cost Response instructions and evaluation criteria
 - Provided detailed assessments of all contractor proposals submitted
 - Participated in debrief/award efforts

Deliverables

- Cost Ground Rules and Assumptions for System Architecture Trade-off Analyses
- Cost proposal evaluation and brief(s)
- Demonstration Phase cost estimate
- EVMS and EAC analyses and briefs
- Characterization of OE system for incorporation into wargaming
- Public Affairs inputs

Orbital Express

Scenario 2-1

(10-meter unmated rendezvous
and capture)

5-6 May 2007

Integrated Performance and Cost Model (IPCM)

Description

- IPCM is a software tool developed for the Office of the Deputy Assistant Secretary of the Army's Cost and Economics (ODASA-CE) office to facilitate conducting cost-effectiveness studies early in the product development cycle
 - Dynamically links cost, engineering, and operational effectiveness models in a common environment
- SEG provided operational effectiveness modeling expertise during IPCM design, development, demonstration, and implementation



Tasks Performed

- Developed prototypical analytic use cases to demonstrate the utility of IPCM
- Incorporated campaign effectiveness models into the IPCM framework (CASTFOREM, Combat XXI beta version)
- Worked with Army customers in structuring analyses to best meet their analytic needs using the IPCM tool
- Assisted in on-site installations of IPCM

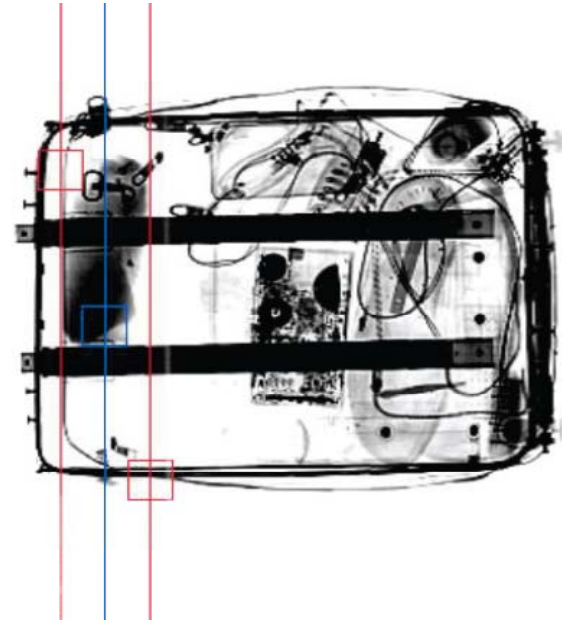
Deliverables

- Draft study plans
- Draft installation support approach/plans
- Draft installation documentation
- Inputs to periodic project status briefings
- Unclassified model inputs for IPCM demonstration

Manhattan II Program

Description

- Manhattan II is a program to develop the next generation of checked baggage screening devices for deployment in the 2011/2012 timeframe
 - DHS Science and Technology (S&T) Directorate program in conjunction with Transportation Security Administration (TSA)
- SEG providing cost and systems engineering support



Tasks Performed

- Performing cost/cost-performance trades
- Constructing cost ground rules and assumptions, a WBS structure, and an LCC model framework
- Interfacing with other S&T/TSA labs and programs
- Responsible for creation of Independent Government Cost Estimate (IGCE)
- Structuring program plans and direction
 - Industry Day, RFP, and Source Selection preparation and execution

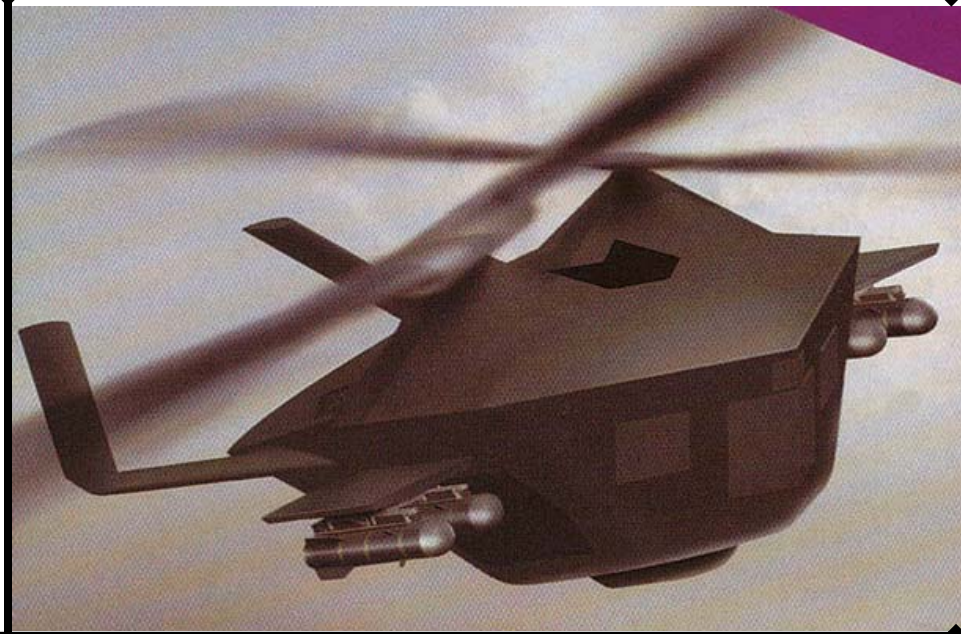
Deliverables

- Draft Solicitation
- Cost Brief for Industry Day
- Draft Work Breakdown Structure (WBS)
- Developing inputs for BAA
- Developing Life Cycle Cost Parameters

Unmanned Combat Armed Rotorcraft (UCAR)

Description

- The DARPA Unmanned Combat Armed Rotorcraft (UCAR) was slated to be an all-weather, highly autonomous and survivable unmanned rotorcraft fully integrated into the Army's objective force combat maneuver force structure.
- SEG was the Affordability/Cost lead for the UCAR program



Tasks Performed

- Assisted in the proposal evaluation and LCC estimating of the UCAR system
- Established formal cost ground rules and assumptions
- Constructed Production estimates for the initial Block 1 UCAR systems
- Actively participated in all major reviews
- Assimilated technical, programmatic, and cost data across aviation technologies

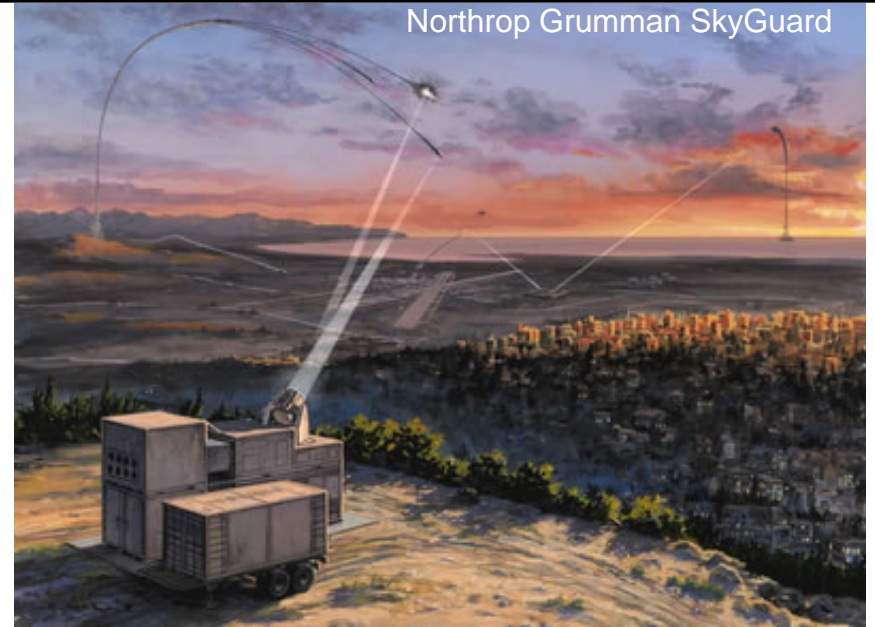
Deliverables

- Developed detailed cost groundrules and assumptions for contractor teams
 - Friendly Asset Acquisition/O&S Costs
 - Enemy Asset Acquisition/O&S Costs
- Feedback and assessment of applicable contractor deliverables across all contractors associated with Phases I and II.
- Created and Provided Briefings to various Working Groups and Conferences

Emerging Counter-MANPADS Technologies (ECMT)

Description

- The ECMT program is a reevaluation of technology alternatives for countering the MANPADS threat that were insufficiently mature in 2003 at the start of the Counter-MANPADS Program.
- SEG supported the source selection and contract award processes



Tasks Performed

- Assisted in the contract award process (drafting Statements of Work, decision memoranda, etc.)
- Provided formal reviews of contractor proposals
 - Formulated key systems engineering and cost engineering questions during oral presentations
 - Compiled reviewer assessments for PM review, final Source Selection Evaluation Board (SSEB) recommendation, and the Source Selection Authority (SSA) decision

Deliverables

- Formal reviews of white papers, proposals, and cost volumes
- Briefs of the source selection process for DHS management review

Strike DIRCM Program

Description

- Strike Directed Infrared Counter-Measures (DIRCM) is a US Navy program created to address the requirement for an autonomous, pod-based system to counter infrared (IR) seeking anti-aircraft missiles
 - An external pod allows application to a broad range of tactical strike aircraft using standard interfaces available at mounting pylons
- SEG provided systems engineering support
 - Goal was to leverage an emerging concept development document and lessons learned on an analogous R&D project to create a System Performance Specification to support a pending solicitation



Tasks Performed

- Assisted in the development/refinement/clarification of requirements
- Reviewed and commented on Concept Development Document (CDD)
- Coordinated the draft of a Systems Engineering Plan (SEP)
- Constructed software lines of code (SLOC) projections for a Strike DIRCM system

Deliverables

- Comments to Draft CDD
- Created Strike DIRCM System Performance Specification
- Drafted SEP
- Provided estimate of Software Lines of Code (SLOC) for DIRCM system

Sensor Platform Architecture Analysis Tool (SPAAT)

Description

- SPAAT is a large-scale, mixed integer program that models the allocation of Intelligence, Surveillance, and Reconnaissance (ISR) resources to validated collection requirements.
 - Sponsored by the Headquarters, Air Force (HQAF/A9), formerly Air Force Studies and Analyses Agency (AFSAA) to conduct cost-constrained optimization analysis of alternative ISR architectures
- An SEG employee has been a co-developer of SPAAT since its inception in 1996



$$\min \sum_{(i,j) \in A} r_{ij} x_{ij} + \sum_{(i,j) \in F} f_{ij} w_{ij} \quad (10)$$

$$\text{s.t.} \quad \sum_{(i,j) \in A} x_{ij} - \sum_{(i,j) \in A} x_{ij} = \begin{cases} -\sum_{k \in T} d_k & h = s \\ d_h & h \in T \\ 0 & h \in V \setminus (T \cup s) \end{cases} \quad (11)$$

$$(UF) \quad x_{ij} \leq \left(\sum_{k \in T} d_k \right) w_{ij} \quad \text{for all } (i,j) \in F \quad (12)$$

$$x_{ij} \geq 0 \quad \text{for all } (i,j) \in A \quad (13)$$

$$w_{ij} \text{ binary} \quad \text{for all } (i,j) \in F \quad (14)$$

Tasks Performed

- Code design, development, verification, and validation utilizing the General Algebraic Modeling System (GAMS)
- Scenario (requirements) development
- Collection system representation in the model
- Study plan development and execution
- Briefing of study results

Deliverables

- Working, validated model
- Model documentation
- Model training
- Scenario databases
- Study plans
- Briefings

Wireless Adaptable Network Node (WANN) Program

Description

- WANN is a DARPA Strategic Technology Office (STO) Program with the purpose of designing, developing, and demonstrating low-cost wireless network nodes.
- SEG is providing cost analysis and support



Tasks Performed

- Provided questions/feedback at contractor CDR presentations
- Evaluated CDR and post-CDR cost data
- Advised Program Management on all cost-related issues

Deliverables

- Cost Assessment Brief
- Cost Assessment Summary Spreadsheet
- Binder containing Brief, Spreadsheet, and all supporting data

Why Consider Us?

- Customer Focus
- Experienced and Dynamic People
- Team-Oriented Environment
- High Quality Analyses
- Innovative Solutions

Business Strategy

- Pursue relevant National Security projects in which our professional services and products directly satisfy the needs of its clients (Contact: Marketing@Summit-Group.com)
- We seek to attract and retain talented and experienced domain experts from the military and DoD civilian population and related academia and industry organizations (Contact: HR@Summit-Group.com)