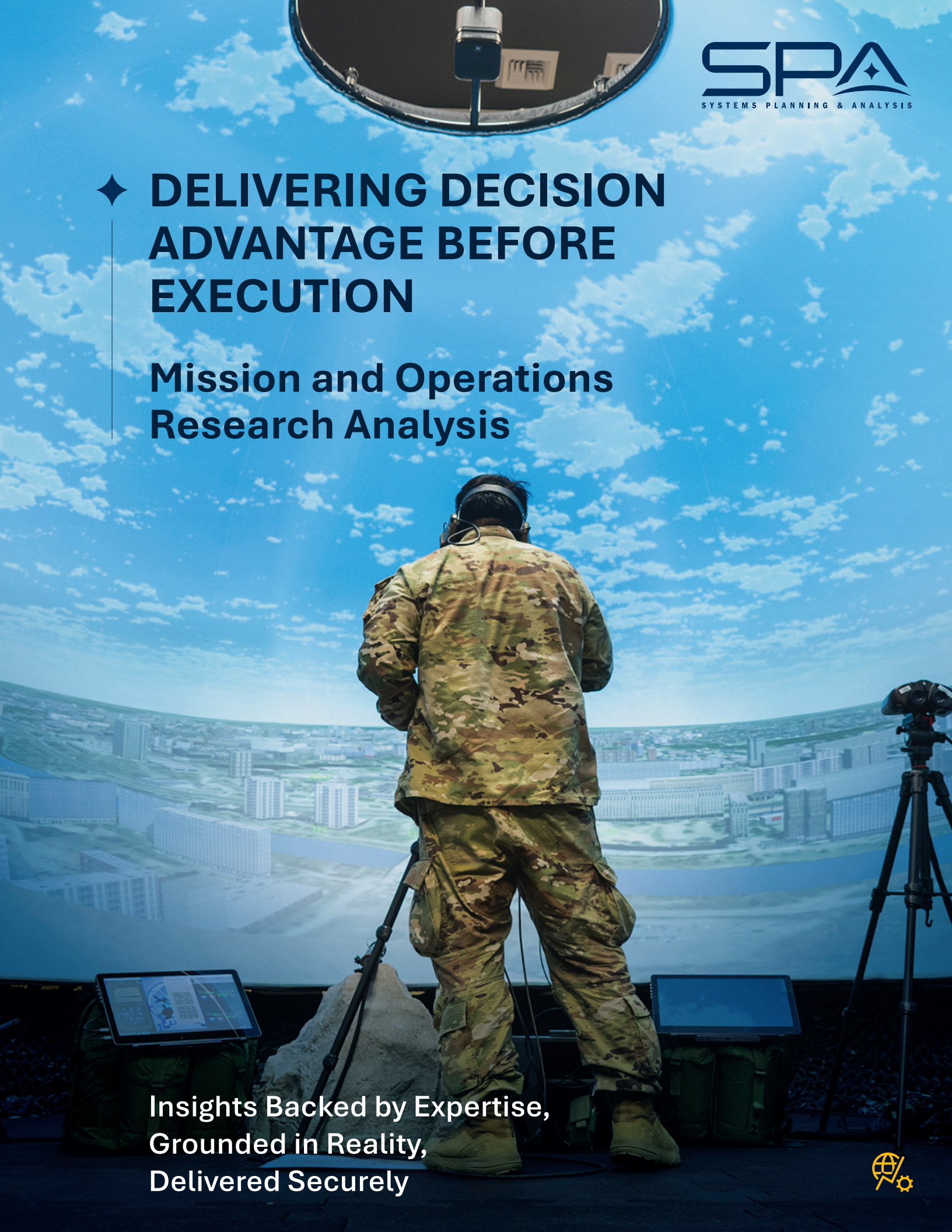


◆ DELIVERING DECISION ADVANTAGE BEFORE EXECUTION

Mission and Operations Research Analysis



Insights Backed by Expertise,
Grounded in Reality,
Delivered Securely





Mission and Operations Research Analysis enables decision-makers to act with speed and precision in complex, multi-domain environments. SPA applies disciplined operations research methods, advanced modeling and simulation, digital engineering artifacts, and intelligence inputs to build decision-quality models that evaluate

systems, missions, and campaigns. Through digital wargaming, campaign analysis, and mission-level modeling, we accelerate iteration, expose trade-offs, and reduce timelines. We transform concepts and data into insights that inform investment decisions, refine operations, and strengthen mission outcomes.

◆ Decision-Quality Modeling for Complex Missions

SPA integrates government, commercial, and proprietary technologies, including tools like SPA ArcherEye™, to build mission-specific simulations that deliver real-world decision advantage.

- Delivers deep insights through data-rich simulation environments
- Models complex mission scenarios to evaluate trade-offs and outcomes
- Reduces risk and cost by stress-testing concepts virtually before execution

◆ Integrated Analysis Across Missions and Campaigns

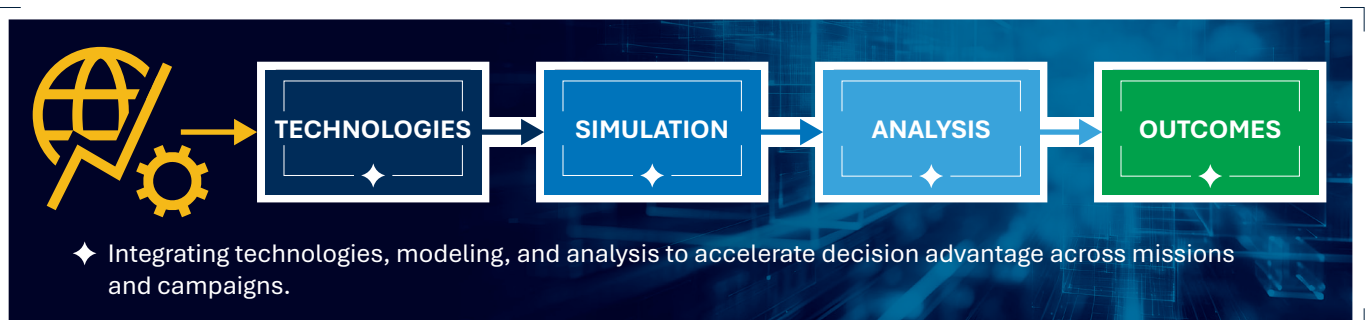
SPA connects operations research, wargaming, campaign analysis, and tool development to improve mission outcomes.

- Conducts rigorous operations research and campaign-level analysis across joint and combined theaters
- Designs and develops advanced modeling, simulation, and wargaming tools, including SPA-developed STORM and SWIFT
- Enables mission-level modeling for capability development, experimentation, and force design

◆ From Tactical Insight to Strategic Advantage

SPA enables agencies to move from analysis to action with speed and confidence, from tactical operations to long-term campaign planning.

- Stress-tests strategic and tactical CONOPS in realistic environments
- Quantifies mission-critical investment and force structure decisions
- Accelerates virtual experimentation and capability development





Empowering Mission Success Through Advanced Analysis

SPA's Mission and Operations Research Analysis capability combines operational expertise, advanced analytics, and mission-informed modeling to solve complex national security challenges with speed. Led

by SPA Fellows Shane Vigil and Phil Pournelle, our teams deliver decision-ready insights through data-driven analysis, digital wargaming, campaign analysis, modeling, and simulation grounded in operational experience.

- | | |
|---|--|
| ◆ Optimization Modeling | <ul style="list-style-type: none">• Develops prescriptive solutions for complex operational scenarios, including cyber and logistics challenges• Optimizes resource allocation, force employment, and cost-benefit trade-offs |
| ◆ Design of Experiments | <ul style="list-style-type: none">• Predicts outcomes and reduces uncertainty through rigorous experimentation frameworks• Tests hypotheses to identify opportunities for mission efficiency and risk reduction |
| ◆ Forecast Analysis | <ul style="list-style-type: none">• Aligns model inputs with mission priorities to generate decision-relevant forecasts• Refines assumptions through expert review to improve forecast accuracy |
| ◆ Discrete Event Simulation | <ul style="list-style-type: none">• Models complex systems and evaluates mission impacts before implementation• Reveals bottlenecks, interdependencies, and operational trade-offs |
| ◆ Custom M&S Application Development | <ul style="list-style-type: none">• Builds tailored modeling and simulation solutions for mission-specific challenges• Applies advanced algorithms and analytics to inform strategic and operational decisions |
| ◆ Red/Blue Force Interactions | <ul style="list-style-type: none">• Analyzes combat dynamics to improve operational effectiveness• Delivers insights by simulating adversary capabilities and operational trade-offs |
| ◆ Exercise and Experimentation Support | <ul style="list-style-type: none">• Combines technical expertise with operational experience to generate meaningful outcomes• Informs future planning through data derived from exercises and real-world experimentation |

SPA Fellows



Shane Vigil
Fellow, Mission Operations Research Analysis - Modeling and Simulation

Leads advanced operations research, modeling, and simulation efforts supporting mission engineering, force design, and strategic decision-making across defense and intelligence. Combines military experience with deep expertise in aerospace systems, analytics, and data-driven mission analysis.



Phil Pournelle
Fellow, Digital Wargaming

Leads digital wargaming and campaign analysis efforts that help defense leaders evaluate future operational concepts, force development, and mission outcomes. Brings decades of operational planning, naval operations, and strategic analysis experience across joint and naval missions.





Real-World Mission Impact



Advancing Aviation Readiness Through LVC Integration

SPA supported the first flight test of the UH-60M Digital Backbone and Mission System Flying Test Bed, using LVC environments to validate interoperability, mission readiness, and system performance.



Enabling Multi-Domain Investment Decisions

SPA developed mission-level models to identify capability gaps and inform force structure and command-and-control investment decisions across air, land, sea, space, and cyber domains.



Driving Strategic Decisions Through Digital Wargaming

SPA applies digital wargaming, campaign analysis, and advanced modeling to evaluate future force structures, operational concepts, and mission trade-offs across joint missions.

Who We Serve

Office of the Secretary of War

Joint Chiefs of Staff

United States Army

United States Navy

United States Marine Corps

United States Coast Guard

United States Air Force

United States Space Force

Defense Advanced Research Projects Agency

Defense Threat Reduction Agency

Department of Homeland Security

Missile Defense Agency

Multiple Intelligence Agencies

National Aeronautics and Space Administration

Department of Commerce

Department of Transportation

Department of Energy

Royal Canadian Navy

United Kingdom Ministry of Defence

North Atlantic Treaty Organization

Australian Department of Defence

Australian Department of Home Affairs

Australian Taxation Office

Australian Department of Health, Disability, and Ageing

Services Australia

Australian Department of Social Services

Decision Advantage for National Security

Systems Planning & Analysis (SPA) is a global, independent analytical and technical innovation firm advancing complex national security priorities. SPA delivers mission engineering, advanced analytics, operational insights, and technology-enabled solutions that accelerate capability delivery and inform strategic decision-making across defense, intelligence, homeland security, and other critical mission areas.



For more information, email: info@spa.com.
2001 N Beauregard Street,
Alexandria, VA 22311
703.931.3500

[spa.com/
what-we-do/mission-
and-operations-
research-analysis/](https://spa.com/what-we-do/mission-and-operations-research-analysis/)

