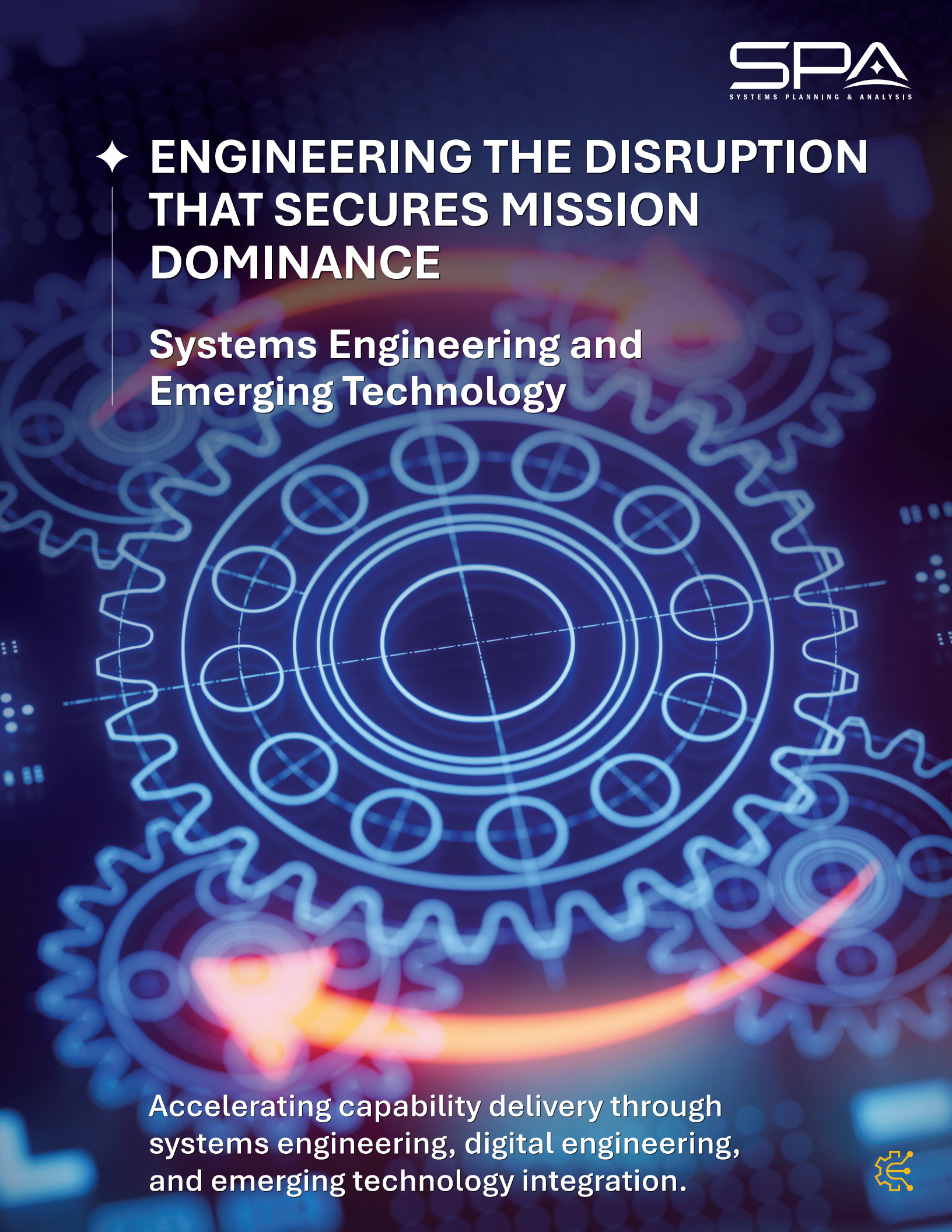
SPA
SYSTEMS PLANNING & ANALYSIS

ENGINEERING THE DISRUPTION THAT SECURES MISSION DOMINANCE

Systems Engineering and Emerging Technology



Accelerating capability delivery through systems engineering, digital engineering, and emerging technology integration.

Our Approach

Systems Engineering and Emerging Technology combines operational expertise with advanced digital tools, such as high-fidelity digital twins and model-based architectures, to accelerate development timelines and enhance system resilience. We leverage emerging technologies to outpace adversarial innovation and maintain mission dominance.

By integrating rigorous systems engineering with leading-edge technologies, SPA designs resilient solutions, validates performance in complex environments, and accelerates capability delivery. This comprehensive approach enables leaders to adapt swiftly to dynamic threats, accelerate capability delivery, and sustain long-term operational readiness.

✦ Resilient Systems for Complex Missions

SPA applies disciplined systems engineering to design, integrate, and modernize capabilities across defense and national security missions.

- Architect resilient, multi-domain systems and mission architectures
- Integrate complex technologies across operational environments
- Strengthen interoperability, scalability, and long-term readiness

✦ Digital Engineering and Validation

SPA leverages digital engineering, model-based systems engineering, and digital twins to accelerate development while reducing lifecycle risk.

- Validate performance in simulated contested environments
- Accelerate collaboration through digital-first engineering practices
- Reduce integration risk through mission-informed modeling and analysis

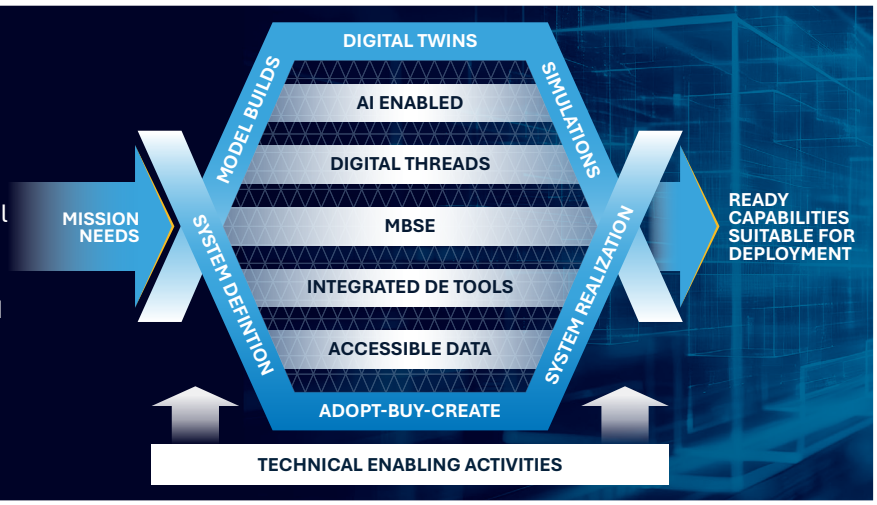
✦ Emerging Technology for Mission Advantage

SPA evaluates emerging technologies and disruptive threats to inform modernization decisions and accelerate capability delivery.

- Counter disruptive technological breakthroughs
- Identify capability gaps and future operational requirements
- Optimize lifecycle performance and mission readiness

TRANSFORM ENGINEERING COMPLEXITY WITH SPA'S SPIDER FRAMEWORK

Using SPA's SPIDER framework (Systematic, Proactive, Integrated Digital Engineering Resource), teams integrate model-based systems engineering, digital twins, simulation, and connected data environments into a unified digital engineering approach. SPIDER accelerates collaboration, improves traceability, and reduces risk across the engineering lifecycle.



Engineering Mission Advantage Through Proven Expertise

✦ Systems Engineering and Architecture Development

- Design resilient architectures for complex mission environments
- Integrate technologies across systems, platforms, and domains
- Improve interoperability, scalability, and long-term readiness

✦ Digital Engineering and MBSE

- Establish digital engineering environments that improve collaboration and traceability
- Accelerate development through model-based systems engineering
- Enable faster decision-making across programs

✦ Digital Twins and Mission-Level Modeling

- Develop high-fidelity digital representations of systems and capabilities
- Evaluate performance before fielding
- Reduce technical and operational risk while accelerating delivery

✦ Test, Evaluation, and Integration

- Validate system performance in realistic operational environments
- Integrate instrumentation, test assets, and emerging technologies
- Generate decision-ready insights that strengthen readiness

✦ Emerging Technology Assessment

- Assess disruptive technologies and evolving threats
- Identify capability gaps and modernization opportunities
- Inform future force development and investment decisions

SPA Fellow

Ed Stewart
Fellow, Systems Engineering and Emerging Technology

Leads systems engineering and technology integration efforts supporting capability development and mission readiness across defense programs. Combines decades of engineering leadership with deep expertise in systems architecture, interoperability, and complex capability integration. Ed is an INCOSE Certified Expert Systems Engineering Professional.

Real-World Mission Impact

Accelerating Joint Kill Chain Integration

SPA applies Model-Based Systems Engineering to advance kill chain development supporting Space Force wargames, the Advanced Battle Management System, and Combined Joint All-Domain Command and Control efforts. This work informs future force design and human-machine teaming concepts across joint missions.

Improving CWMD Testing Through Integration

SPA strengthened DTRA's ability to integrate complex systems within the CBRNE domain during HUMBLE JASMINE 3 by incorporating novel test articles, hyperspectral instrumentation, and data acquisition systems. This integration accelerated validation of counter-WMD capabilities in operationally relevant environments.

Boosting Link-16 Performance with Digital Twins

SPA developed a digital twin of the MIDS JTRS radio incorporating more than 140,000 system-level requirements and integrated it into a mission-level model to evaluate future Link-16 network effectiveness and accelerate capability development.

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.

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

spa.com