



**Metron, Inc.**  
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Metron, Incorporated is a scientific consulting firm, founded in 1982, with expertise in the areas of physical modeling, probability theory, modeling and simulation, operations research, and software design and development. Metron's Simulation Sciences Division (SSD) provides simulation sciences based high-technology solutions and support to Government and commercial clients. Metron SSD is a DoD industry leader in the representation of information-driven systems and behavior. Metron's military simulation systems provide comprehensive treatments of information collection, information dissemination, situation assessment, and dynamic resource allocation systems and processes. The human decision makers observe-orient-decide-act cycle is explicitly represented in these systems. Metron SSD also employs its simulation system products in support of both real-time operations and training, and acquisition analysis. Metron SSD analysts and software analysts have participated in numerous real-world operational exercises, war games, and analyses. Metron plans to continue to pursue opportunities to demonstrate and employ its simulation services in support of real-world applications.

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**SBIR Investment:** \$550K.

**Non-SBIR Investment:** >\$30M

## Composite Warfare Model/Naval Simulation System



### About the Technology

Metron developed the Composite Warfare Model (CWM) under the SBIR program. Further development continued under a Northrop-Grumman contract and the resulting technology was transitioned back to the Government in the form of the Naval Simulation System (NSS). NSS is a modeling and simulation software development program. Its principal goal is the development of a tool to be used by 1) operational planners and decision makers in support of course of action analysis and plan evaluation; 2) the analysis community in support of high-level concept assessments and system effectiveness studies; and 3) Fleet exercises, war games, and experiments in support of planning, execution, and analysis. NSS' vision is implemented as a set of validated low-to-high resolution warfare entity models, certified data, appropriate simulation services, and related user support tools in a framework suitable for modeling multi-warfare scenarios. Users are able to build upon the core capabilities of the NSS framework, thereby minimizing the cost and time needed to satisfy their individual unique requirements. Selected improvements by individual users are integrated via a configuration management process into the baseline NSS requirements to expand the overall capability for the entire user community. NSS is Defense Modeling and Simulation Office high-level architecture (HLA) compliant and Defense Information Infrastructure common operating environment (COE) Level 7 compliant.

### Benefits to PEO C4I&Space and Other DOD Programs

NSS capacity to replicate C4ISR (command, control, communications, computer, intelligence, surveillance, and reconnaissance) entities and organizations robustly makes it unique among DOD M&S tools. NSS has been used in numerous Fleet exercises and Fleet Battle Experiment operational exercises and experiments. NSS has also proven to be a valuable warfare assessment tool. It is in full-time use at Commander Pacific Fleet (COMPACFLT) in support of detailed Operational Plan and Fast Track system analyses. It is in full-time use at Chief of Naval Operations (CNO) N81 for acquisition studies and analysis support. NSS is recognized as the first Navy simulation with the capability to evaluate FORCENet C2 enhancements. It supports numerous Navy Laboratories in detailed systems and concept of operations studies and analysis.

### Why CWM/NSS Improves the Technology

- Permits the assessment of detailed surveillance, battle management, C4I, and engagement related architectural concepts with traceability to high-level war fighting impacts.
- Provides support to acquisition analyses, operational decision support, war games, and operational experimentation.
- Supports the Global Command and Control System to support course of action analysis.
- Enables the Navy to support operational exercises and experiments, laboratory-based war games, and distributed simulation.
- Provided the Defense Modeling and Simulation Office (DMSO) with one of the first major Navy simulations that was HLA compliant.

### Military and Commercial Significance

- Industry (Northrop-Grumman, Lockheed Martin, Boeing, and others) is employing CWM and NSS for aircraft design studies, ship C2 design studies, Institute of Scientific Research architectural concept assessments, man-in-the-loop studies, cost effectiveness trade-off studies, and competitive systems trade-off studies.
- Users of NSS include the Joint Staff, CNO, System Commands, the Fleet Battle experiment series, COMPACFLT, Joint Warfare Analysis Center, and the Numbered Fleet Commands.
- Joint Systems Analysis Simulation (JSAS), a "for export" version of NSS, has been exported to Japan for use by the Japanese Maritime Self Defense Forces (JMSDF).

