

Executive Summary

International Systems Management Corporation (ISM) has been successfully managing multiple contracts in support of the US Navy since February 2003. Together with our proposed team of BAE Systems, Technology Service Corporation (TSC) and Paradigm Inc. we bring highly talented personnel with outstanding past performance numerous functional areas. The following provides highlights of work our team has performed over the last three (3) years in the National Capital (Zone 2) Region.

Zone 2 - National Capital Region

SOW 3.1 – Research and Development (R&D) Support. Under Order 05 to N00178-03-D-3074, BAE Systems provides Navy Open Architecture (OA) concept formulation and system development to NSWC Dahlgren T-30. Operational requirements, Navy OA Functional Architecture (OAF) definitions, Command and Control (C2) models, model use case development, and interface standards development are provided.

SOW 3.2 – Engineering Support. Under a subcontract for N00024-01-D-7014-0009, ISM Corp provides engineering support to Navy's Program Executive Office for Integrated Warfare Systems (PEO IWS) in support of development of warfighting capabilities for US Navy (USN) Destroyers (DDG) and Cruisers (CG). Our team has been a critical contributor by:

- Developing a technical and programmatic strategy to upgrade the Navy's Aegis CGs and DDGs to an Open Architecture (OA) computing environment and tactical computer program.
- Evaluating OA technical approaches from the Aegis Design Agent (Lockheed Martin).
- Synthesizing and promulgating OA comments and concerns from the NAVSEA Dahlgren.
- Coordinating impacts with the Navy's Program Executive Office, Ships (PEO Ships) on Aegis OA impacts to legacy Ship configurations.
- Developing fielding profiles and requisite funding requirements.
- Developing Aegis Open Architecture briefings including computer program metrics and Aegis Status briefings for the Deputy CNO Warfare Requirements and Programs, Surface Warfare office (OPNAV N76F), and various Congressional briefings.
- Supporting the PEO IWS Combat Systems Way Ahead (CSWA), Navy EXCOMMs, and development of technical briefings for the Deputy Assistant Secretary of the Navy, for Integrated Warfare Systems (DASN IWS).

On behalf of the Integrated Combat Systems Project Office, the team worked with PEO Ships, the Aegis Installation and Test Office, Lockheed Martin, NAVSEA Dahlgren, and OPNAV N766 in developing a recommended POM-08 warfighting improvements package for modernizing the Navy's Aegis Destroyer Fleet. The team evaluated warfighting gaps, Chief of Naval Operations (CNO) and OPNAV priorities, tactical computer program impacts, fielding opportunities, ship impacts, development schedules, cost, and reuse of already fielded capabilities and interfaces from USN and Foreign Military Sales (FMS) Aegis configurations.

Our team supported the development of the initial technical plan for integration of the Ballistic Missile Defense (BMD) capability into an Aegis OA Baseline for purposes of a simultaneous Strategic and tactical multi-mission capability for Aegis CGs and DDGs. The team supported the Navy in developing a plan to build a Commercial Off-the-Shelf (COTS) variant of a AN/SPY-1D(V) Signal Processor in support of improved littoral and BMD multi-missions.

Our team is directly supporting the development of a plan for integration of the Joint Single Integrated Air Picture System Engineering Organization (JSSEO) Integrated Air Behavioral Model (IABM) into the Aegis fleet for the objective of introducing Joint Interoperability with the Nation's other Military Services. The team is coordinating with the PEO IWS Command and Control Office, PEO IWS Naval Open Architecture Office and the PEO IWS Technical Director in developing an approach to integrate the IABM into Aegis Cruisers and Destroyers via an Open Architecture Track Manager (OATM) while simultaneously supporting a software re-architecture of the remaining components to a common command and control (Common C2) for re-use across multiple Navy platforms.

Under sub-contracts for N00024-01-D-7014-0009, N00024-04-C-5129, and BAE's GSA GS-23F-0005K, ISM provides engineering support to PEO IWS International Programs Office in support of FMS Cases to Japan, Spain, Korea, and Australia.

Our team assists in the formulation of all the foreign customers' requirements into an FMS case. The team supports international meetings between the foreign customers and PEO IWS, synthesizes foreign capability requirements, and identifies the systems required to meet these capabilities. The team assists PEO IWS interfacing with appropriate Participating Acquisition Requirement Managers (PARMs), including NAVAIR, NAVSUP, Aegis BMD, NAVSEA, SPAWAR, as well as Original Equipment Manufacturers (OEMs) and NAVSEA Field Activities.

Our team conducts releasability reviews of USN technology to identify critical technology that must be protected from foreign disclosure and is a member of the releasability IPT. We support PEO IWS in responding to foreign requests for financial, programmatic and technical information. The team provides PEO IWS highlights of technical efforts, risk assessments, and issues facing the PEO's International Programs on a weekly basis.

We support PEO IWS in managing the Korea, Japan, Spain, and Australia combat system FMS acquisition programs. Our engineers prepare the Government for working groups with OEMs and foreign customers, ensure that the Interface Development Specifications (IDSs) are complete, accurate and released in time to support productive meetings. Our team's engineering expertise is critical in technical issue resolution and in preparation of technical decision presentations.

Our team's understanding of total combat system case management requirements has ensured that USN is able to develop accurate FMS cost estimates for our foreign allies. We support USN in identifying foreign customer's period of performance, delivery schedules, logistics requirements, equipment requirements, domestic systems being installed requiring unique

interfaces, estimated funding availability, and budget constraints. We support tasking of the PARMs and field activities for cost estimates and acquisition planning data (7300 Forms).

Our team works with other Program Engineers (e.g. SSDS, SPQ-9B, and Open Architecture) to identify possible FMS applicability. We have demonstrated capability to build integrated teams that allow FMS and USN programs to mutually benefit from each through central coordination. For example, our team is at the center of the OA Co-research effort between Japan and USN, objectively reducing future US OA development risks.

The team supports development and briefings to foreign Shipyards explaining technical details on US equipment, installation requirements, impacts on foreign ship design and combat systems. Our team developed installation instructions and diagrams for the Digital Sonar Velocity Log (DSVL) on the Spanish Frigate F-101 (first Surface Combatant DSVL install). These instructions were subsequently used on numerous DSVL installs in many shipyards.

Our team has demonstrated superior performance and extensive knowledge of FMS Cases with Australia, Germany, Japan, Korea, Norway, Portugal, Spain, and Turkey. Examples of some of our demonstrated capabilities include:

- Leadership of the initial Korean KDX-III Class Destroyers Combat Systems Engineering (CSE) Integration Working Group (IWG) and Ship Integration and Test (SI&T) IWGs at the critical start-up phases of the technical development program. Resulted in successful Korean KDX-III Class acquisition milestones (System, Preliminary, and Critical Design Reviews).
- Development of program management plans for future Korean KDX-III cases. Plans include cases for computer program maintenance, training support, lifecycle support and CSSQT.
- Leadership in coordination with Aegis Combat System Acquisition Agents for land based testing of their systems with FMS computer programs prior to shipboard installation.
- Coordinated deliveries to FMS Ships and onsite FMS test assistance during equipment Initial Light Off (ILO) and System Functional Testing.
- Development of the Australian Air Warfare Destroyer (AWD) combat system development plan. Included initial requirements definition, IWGs, and Computer Program development timelines for acquisition milestones, testing, Government acceptance, and at-sea tests.

SOW 3.3 - Modeling, Simulation, Stimulation, and Analysis Support. Under contracts N00178-99-C-3034, N00024-96-C-5166, N00024-00-F-2307, N00164-01-D-0039, GS-23F-0032L, and GS-35F-4357D, TSC develops radar and other detection systems models and simulations, sensor environments, and hardware stimulators. TSC's simulations address several key US Navy radar systems, including the AN/SPY-1 family and the AN/SPQ-9B. TSC developed several important environmental simulations, including the AEGIS sea clutter model, a sea spike simulation, and a propagation and clutter tool (EMPCODE).

TSC's AN/SPY-1 simulations include the Testable Component Environment (TCE), which has been accredited for Cruiser Modernization testing. TCE is engineering software support code that runs the actual AN/SPY-1 tactical Radar Control Computer Program (RCCP) code in a desktop environment to simulate threat and environment scenarios, to exercise RCCP functionality (for debug and development), and to format data recording that can be read into both TCE's and other, existing analysis tools.

TSC's high fidelity simulation of the AN/SPQ-9B radar system, consists of a detection model and the local air tracker. The detection model is a full signal processor simulation including the effects of folded clutter and front end analog filtering. The Local Air Tracker models the multiple hypothesis tracker used by the AN/SPQ-9B to unfold Doppler and range ambiguities. The interface between the two components is regularly used to test model validity by running detection model outputs through actual AN/SPQ-9B hardware at Northrop Grumman Norden Systems in Melville, NY.

TSC provided modeling and simulation support to the NSWC Dahlgren Theater Warfare Department for Ground-based Mid-Course Defense (GMD) program. TSC developed a simulation of the GMD system, the NMD Probability Analysis Tool (NPAT), to independently validate and verify the Boeing GMD LIDS in support of the accreditation of the GMD system requirements and design. NPAT is an object-oriented, open system design that enables plug and play of models of varying degrees of fidelity into the NPAT simulation.

TSC's M&S efforts include treatments of propagation and clutter. Propagation affects both the detectability of targets (friend, foe, and neutral) and the measurement of their locations and kinematic states, which in turn, affects tracking performance of radars and EW sensors. Clutter also affects the detectability of targets and presents the added problem of false alarms from clutter. TSC developed a novel data compression algorithm under a US Navy SBIR program to accurately model the propagation effects.

SOW 3.4 - Prototyping, Pre-Production, Model-Making, and Fabrication Support. TSC, under contract with the Naval Air Warfare Center (NAWC), Weapons Division, China Lake, CA (N00173-01-F-2000), developed a prototype infrared (IR) source for stimulating IR missile warning systems under test at the Electronic Combat Range (ECR).

Under SBIR (N00024-01-C-4032) with NAVSEA, TSC is developing a system for detecting low probability of detection radars. The program's objective is to develop an inexpensive and compact Electronic Warfare support receiving system that will provide detection of low-power FMCW and pulse compression radars at ranges greater than the detection ranges of the radars. TSC responded to an immediate operational need by designing and developing a tactical radar system that protects armored vehicles from incoming rocket-propelled grenade (RPG) and anti-tank guided munition (ATGM) threats. TSC developed the exciter, transmitters, receivers and signal processor boards, and other components for the radar design under contract (JVYS05001, Purchase Contract 111298).

SOW 3.5 - System Design Documentation and Technical Data Support. Under Orders 10 and 30 to N00178-01-D-1050, BAE Systems prepares, evaluates, and updates system integration documentation for VLS and all VLS-launched missile variants. Detailed analysis of variant configurations and system interfaces is performed and documented in complex documentation.

SOW 3.6 - Software Engineering, Development, Programming, and Network Support. Under N00178-03-C-2003, BAE Systems analyzes, designs, writes code for, tests, and integrates software for TOMAHAWK Weapons Control Systems. We also provide analysis and

development of test facilities. The software development processes (jointly used by NSWC Dahlgren and BAE Systems) have been approved at SEI CMM Level 3.

SOW 3.7 - Reliability, Maintainability, and Availability (RM&A) Support. Under 22 orders to M67854-00-D-01011, BAE Systems provides RM&A studies and monitoring to several U.S. Marine Corps (USMC) programs, including Infantry Weapons Systems, M1A1 tanks, Amphibious Assault Vehicles (AAVs), fire support and anti-armor systems, ammunition management, Anti-Terrorism and Force Protection systems, Raids and Amphibious Reconnaissance Systems, and non-lethal weapons and technologies. Analyses are delivered that result in cost-saving and performance-improving ECPs.

SOW 3.10 - Configuration Management (CM) Support. Under 16 orders to N00178-01-D-1050, BAE Systems performs baseline identification, status accounting, and audits for hardware, software, and documentation resources of guns/munitions, missiles, and launcher programs.

SOW 3.11 – Quality Assurance (QA) Support. Under N00178-01-D-1050 Orders 1, 3, 12, 14, 21, 34, 36, 39, 52, and 55, BAE Systems analysts review and update technical documentation, engineering drawings, production processes, and manufactured parts and assemblies in Dahlgren and at manufacturing and testing facilities nationwide.

SOW 3.12 - Information System (IS) Development, Information Assurance (IA), and Information Technology (IT) Support. Under Orders 13, 47, 49, and 50 to N00178-01-D-1050, BAE Systems provides IS development, IA, and IT architecture development to NSWC Dahlgren's Joint Project Office for Special Technology Countermeasures, continuing work initiated under N00178-97-D-1015 Order 83. BAE leads an integrated team that uses a system engineering approach to provide information system requirements definitions, develop system/subsystem specifications and definitions, design system interfaces, develop web-based products and tools, and analyze software and documentation for databases and systems outside the NMCI envelope due to the classification of the DoD Critical Infrastructure Protection (CIP) Program.

SOW 3.13 - Ship Inactivation and Disposal Support. Under multiple delivery orders to GSA Contract GS-23F-0005K, BAE Systems provides direct technical, programmatic, and logistics support to NAVSEA Security Assistance Program Office's International Ship Transfer Management Division SEA 63IPX. BAE performs tasks to ensure security of critical technology for active ships undergoing hot transfers and inactive ships undergoing reactivation, including developing White Paper studies for adjudication of Kidd Class Destroyer software and hardware.

SOW 3.14 - Interoperability, Test and Evaluation (T&E), Trials Support. Under Orders 112 and 124 to N00178-99-D-3034, BAE Systems provides Distributed Engineering Plant (DEP) and Joint Distributed Engineering Plant (JDEP) program management and system engineering to NSWC Dahlgren T-30. The team conducts assessment, demonstration, and facilitation of Battle Management, Command, Control, Communications, Computers, and Intelligence (BMC4I) system interoperability in support of the Battle Force Interoperability (BFI) program. We

operate and maintain the DEP configuration and provide engineering and technical support for computer program development, modification, data management, and electronic documentation.

SOW 3.15 - Measurement Facilities, Range, and Instrumentation Support. Under Orders 22 and 53 to N00178-01-D-1050, BAE Systems performs extensive services for the NSWC Dahlgren main and auxiliary ranges, including test arena design and setup, shell house operations and ammunition loading, site remediation, and test data analysis.

SOW 3.16 - Acquisition Logistics Support. Under 36 orders to M67854-00-D-01011, BAE Systems provides acquisition logistics support to MARCORSYSCOM across programs including Infantry Weapons Systems, M1A1 tanks, and AAVs. We conduct reliability studies and equipment testing to ensure readiness. We develop logistic support summaries and analyze existing organizational tables of equipment to ensure that readiness requirements are met and incorporated into all phases of the acquisition process.

SOW 3.17 - Supply and Provisioning Support. Under 17 orders to M67854-00-D-01011, BAE Systems provides Supply and Provisioning expertise to MARCORSYSCOM for programs such as Infantry Weapons Systems, M1A1 tanks, AAVs, and fire support. We research and analyze organizational structure and equipment requirements to ensure USMC has proper materials in place to supply the warfighter.

SOW 3.19 – In-Service Engineering Support. Under contract N00024-01-D-7014-0009/SC-152138 ISM provides In-Service Engineering Support for PEO IWS 1.0 for USN Combat Systems. The team has a deep understanding of the process and execution of in-service engineering of surface warships and has:

- Facilitated meetings between OEMs, Combat System developers, and Shipbuilders to ensure Aegis Combat System electrical, mechanical, and environmental requirements are met.
- Managed the development of scope, schedule, and funding requirements for the development of an In-Service CP update to the Aegis Baseline 7.1 Combat System (Baseline 7.1.1.1).
- Supported development of fleet briefing to the Navy's Type Commanders, Ship Commanding Officers, and briefings to Commander Naval Forces Atlantic and Pacific.
- Managed in excess of 20 senior engineers and financial management personnel, providing direct support to the Aegis Baseline Manager, Aegis Combat Systems Manager, and Aegis Technical Director. Provided engineering, technical, financial, and programmatic support for multiple Aegis In-Service Baseline development efforts.
- Participated in and/or led PEO IWS headquarters efforts for major Aegis development milestones, such as: 7 Phase I CDR; 7 Phase IR System and Preliminary Design Reviews, 7 Phase IC Design Reviews, 6.3.1 Certification, and Aegis Open Architecture Lifecycle Objective Review (LOR) and Lifecycle Architecture Review (LAR).
- Coordinated with the Advanced Architecture Warfare Area Manager (WAM) to address COTS Obsolescence issues in Baselines 6.1, 6.3, and 7.1. Developed reviews of technical requirements and options for risk mitigation for the fleet assets.

- Assisted with Baseline 6 Phase III and 7 Phase I Transition Working Groups (TWGs) to facilitate the transfer of Aegis Baselines from development at Lockheed to lifetime support at Dahlgren and to the Fleet.

Under contracts N00024-01-D-7014-0009/SC-152138 and N00024-04-C-5129/SC-144002 ISM has provided In-Service Engineering Support to PEO IWS 4.0 for Japanese KONGO Class Ships and In-Service Engineering Planning for Korean KDX-III Class Ships.

The team supports the Japanese KONGO program from FMS case formulation through ship commissioning and CSSQT. The cases include procurement of the AEGIS Weapon System, applicable combat system equipment, and support material. The team coordinates KONGO Class Lifetime Support engineering efforts, including high priority technical issue resolution, single computer program baseline planning, availability planning, investigating modernization candidates, and maintaining compatibility with USN Ships.

The team has prepared lifecycle support plans for the Korean KDX-III. Our team explained Computer Program Maintenance (CPM) and Combat System Engineering (CSE) Life Cycle Support to the Korean Navy, identified the need to plan for computer program changes anticipated to be identified during the Ship's test period, Multi-Element Integration Testing, by Ship's Force, and Combat System element changes (USN/domestic). Our Team reviewed the Aegis Maintenance philosophy with the Korean Navy to keep Ao (A sub o) greater than 90% by evaluating design redundancy, onboard maintenance, sparing, training, shore side support, and preventive and condition based maintenance. We explained the roles of USN lifecycle organizations (Planning Yards, In-Service Engineering Agents (ISEAs), TYCOMs, Shipyards, Combats System Engineering Agents (CSEA), Intermediate Maintenance Activities (IMAs), and Organizational, Intermediate, and Depot Level Maintenance activities).

SOW 3.20 – Program Support. Under a sub-contract to N00024-01-D-7014-0009, ISM provides Program support to PEO IWS 1.0 in support of increasing warfare capabilities on USN DDGs and CGs Class Ships. Our team is involved in all aspects of Aegis programmatic management and has:

- Developed and maintained the Aegis Spend plan, a budgetary tool for execution year and future years funding requirements
- Developed bi-annual Program Objective Memorandum (POM) issue papers for development of new capabilities. The issue papers covered Programmatic, schedule, funding, and other conjunctive programmatic and technical requirements.
- Supported the bi-annual Program Review (PR) process for realignment of requirements and funding due to changes in schedules or direction.
- Been entrusted by our customers to directly brief the OPNAV sponsor.
- Interfaced with PEO Ships for alignment of computer program development schedules with shipbuilding and modernization plans.
- Supported the development of the PEO IWS combat system way aheads by providing Aegis programmatic, financial, and scope inputs.
- Led Integrated Baseline Reviews (IBRs) efforts conducted with the prime developer for Baselines 7 Phase I, 7 Phase IR, and AOA Spirals 1 & 2. IBRs provide an analysis of the program funding against the technical requirements and form the basis for EVMS baseline.

- Supported development of numerous Navy letters, briefings, and papers in support of the Aegis Program Office. Examples include:
 - Aegis Combat System Baseline Letters and Baseline Fielding Plans for use by the Program Office and OPNAV Sponsor.
 - Brief to Senator Warner on Aegis maintenance philosophy and Budget cuts to Dahlgren.
 - Briefing packages to SURFPAC and SURFLANT on Aegis development and upgrades.
 - Coordinated and drafted quarterly inputs into the ASN RDA metrics reports for Aegis Baseline Computer Program Development. Reviewed detailed analysis of EVMS data provided by DCMA and provided highlights of program risks that are being tracked.

As a sub-contractor for N00024-01-D-7014-0009, N00024-04-C-5129, and BAE's GSA GS-23F-0005K, ISM provided Program support to PEO IWS 4.0 in support of FMS Cases to Japan, Spain, Korea, and Australia. Our team interfaces directly with industry prime contractors, Navy Systems Commands and Navy field activities to assist in the development of program budgets, program execution and engineering management. The ISM team has successfully supported PEO IWS in managing combat system cases totaling over \$5 Billion in support of our Allies.

Under contract N00178-04-D-4018, ISM provides Program Support to PEO IWS 3A (STANDARD Missile Program office) regarding Standard Missile FMS Cases to various countries. The team is:

- Responsible for executing two international Memorandums of Understanding (MOUs) and coordinating meetings to define the scope of technology release. Developed the Delegated Disclosure Letters (DDLs) specifying the scope of technology transfer in coordination with the Navy International Programs Office (IPO).
- Primary liaison with assigned Cooperative Program Personnel (CPP) from Germany and The Netherlands. Ensure that CPPs are integrated at the appropriate areas in the US Program Office through regular coordination meetings.
- Annual STANDARD Missile Cooperation Conference planning, which hosts German and The Netherlands representatives for future MOU activities/opportunity discussions. Drafting an In-Service Support MOU and advising the Program Office on MOU timelines and execution.
- Supporting international activities within the Program Office. Coordinating foreign release approval to brief new initiatives and capabilities to international customers. Advisor to the STANDARD Missile Users Group forum on foreign customer content and applicability.
- Coordinating Aegis BMD Japan SM-3 maintenance activities. Supports Program Office participation in regular Joint Steering Committee forums.