



SeaVision

Project Description (PD)

SeaVision Release 1.0

SRS Version 1.0

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1. INTRODUCTION

The sharing of unclassified maritime information is a fundamental enabler to multiple Department of Defense (DoD) missions. In support of missions of Maritime Security, Forward Presence, and Humanitarian Assistance/Disaster Response (HA/DR), Naval Component Commands (NCC) and Numbered Fleet Commands (NFC) have a requirement for an unclassified information sharing capability accessible by mission partners.

The Office of the DoD Executive Agent for Maritime Domain Awareness (EAMDA) is charged with defining unclassified Maritime Domain Awareness requirements and capabilities¹. OPNAV N2N6 has been requested to identify and fund a program to provide the long-term solution for the Fleet-wide requirement of enterprise access to maritime data, automated analytics and information sharing capabilities to support operational activities in an unclassified/Non-PKI environment². SeaVision will evolve from its current state as a partnership-building tool to an enterprise-wide capability that is non-proprietary (government/commercial owned) and leverages millions of dollars already expended in research and development efforts.

1.1. BACKGROUND INFORMATION

In 2012, the DoD EAMDA provided a one-year trial license for the Computer Assisted Maritime Threat Evaluation System (CAMTES) to Maritime Operations Centers (MOCs) at the Naval Component Commands (NCC) and Numbered Fleet Commands (NFC) to evaluate its effectiveness of partnership building³. CAMTES is a system developed with U.S. Naval Forces Europe (COMUSNAVEUR) that conducts analytics and generates/shares alerts based on a set of predefined and user customizable rules.

In 2013, a capability with CAMTES-like functionality was articulated as a continued requirement by U.S. Fleet Forces Command (COMUSFLTFORCOM)⁴. The need to develop near-term and long-term solutions for an unclassified MDA capability that aligns with MOC standardization exists today. COMUSFLTFORCOM extended the CAMTES contract period for one year while a MDA Capabilities Requirements Working Group stood up to codify MDA unclassified capability requirements.

The result of the MDA Capabilities Requirements Working Group was a requirements letter from Commander, U.S. Fleet Forces Command to N2/N6.⁵ This letter defines a Fleet requirement for enterprise access to maritime data, automated analytics and information sharing capabilities to support operational level MDA in an Unclassified/Non-PKI environment. Additionally, in 2015 a revision to the OPNAV N2/N6 Core Baseline (CB) and Mission Builds (MB) was released to reflect modernization upgrades and to establish the approved MOC CB/MB. CAMTES was added to the description of changes with the reasoning, "CAMTES is an interim addition until a solution is fielded that satisfies updated requirement."⁶

¹ Department of Defense Directive 2005.02E, Maritime Domain Awareness (MDA) in the Department of Defense, 31 March 2015

² Operational Level Unclassified/Non-Public Key (Non-PKI) Maritime Domain Awareness (MDA) Requirements Letter, 03 Nov 2014

³ Capability Evaluations in Support of Partnership Building, 29 Nov 2012

⁴ COMUSNAVSO Message DTG 231258Z Jul 13

⁵ Operational Level Unclassified/Non-Public Key (Non-PKI) Maritime Domain Awareness (MDA) Requirements Letter, 03 Nov 2014

⁶ Changes to Maritime Operations Center (MOC) Core Baseline and Mission Systems 2016 (CB/MB16), 12 January 2015

1.2. OBJECTIVE

The objective of this effort is to increase the functionality of SeaVision to meet Fleet operational needs, such as the ability to share unclassified information in a PKI/Non-PKI environment between the U.S. Government, international partners, industry and other organizations to improve maritime operations.

1.3. PROJECT DESCRIPTION

SeaVision will be the Navy-wide capability implemented regionally and provide the ability to operate in a low-bandwidth and unclassified PKI/Non-PKI environment. Sharing and managing maritime data will be conducted via standard exchange models and security attributes. Figure 1 shows the high-level components of the SeaVision architecture.

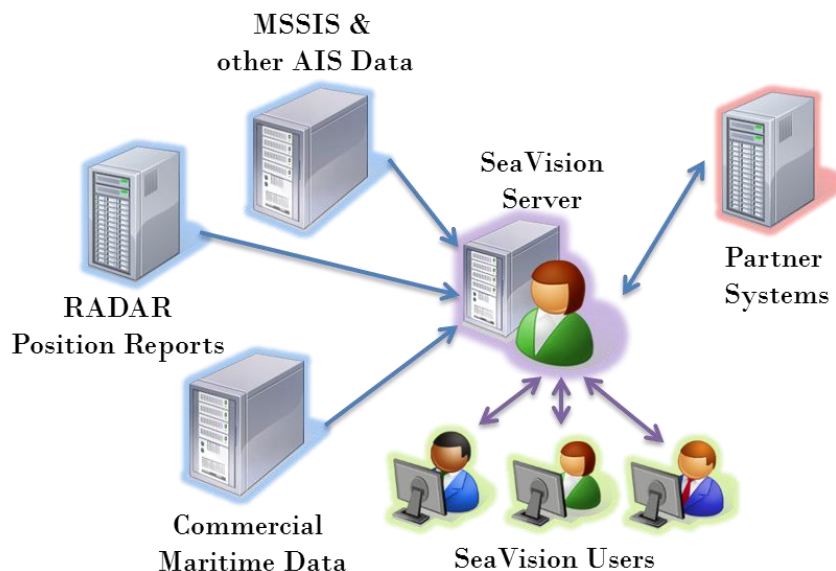


Figure 1: SeaVision Conceptual Overview

SeaVision will populate data to include ship position, characteristics, movement history, ownership, cargo, crew, interest, port visit, voyage information, and imagery, as defined in the National Information Exchange Model (NIEM).⁷ Mission partners will have the ability to contribute their own data sets using defined exchange models (e.g. coastal radar tracks).

SeaVision uses Google maps as the geographic presentation of a common maritime picture. Users will have the ability to export SeaVision data in multiple formats to view on Google Earth. Functionality will also include the ability to develop user-defined queries using automated business rules to integrate and correlate data to conduct risk assessments, highlight anomalies, and generate alerts and warnings. SeaVision will include automated exchange of standardized information (e.g. text, queries, etc.) on a one-to-one or one-to-many basis. Figure 2 is an example of the SeaVision interface.

⁷ The National Information Exchange Model (NIEM) is the Department of Defense (DoD) Chief Information Officer preferred model for standards based exchanges.

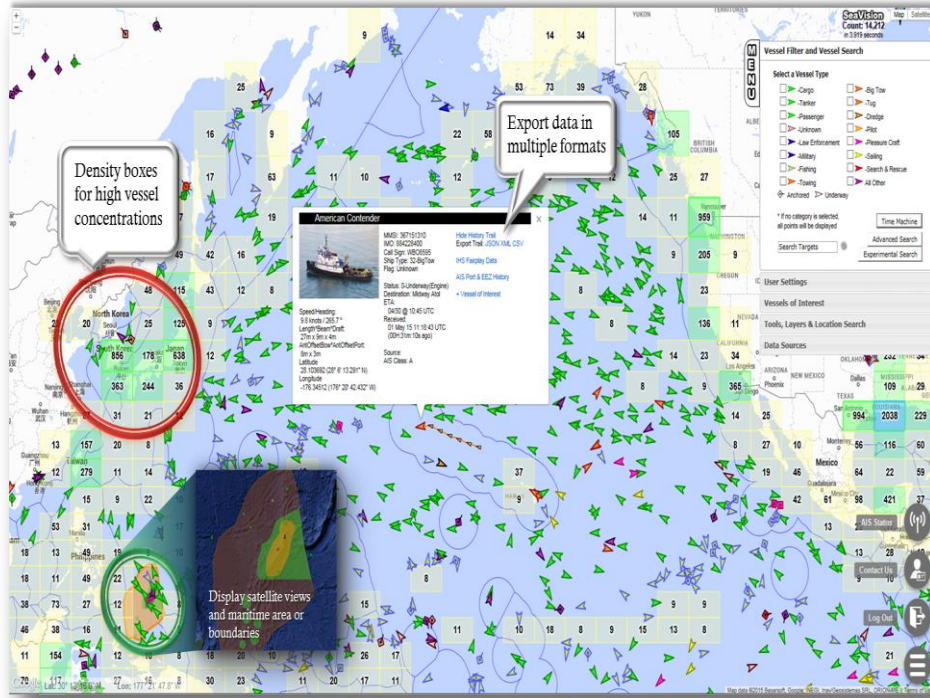


Figure 2: Example of SeaVision Interface

SeaVision access will be granted based on user accounts. Individual user accounts allow for management and access control of information, products, features and capabilities. With the exception of administrators, all users will belong to one or more communities. Department of Transportation (DoT) Volpe Center will be the Enterprise Administrators and will be responsible for managing Community Manager accounts. Community Managers will manage users within their community. Volpe will continue to manage all user accounts until the user management hierarchy (Figure 3) is in place. SeaVision and supporting data will be hosted at Volpe.

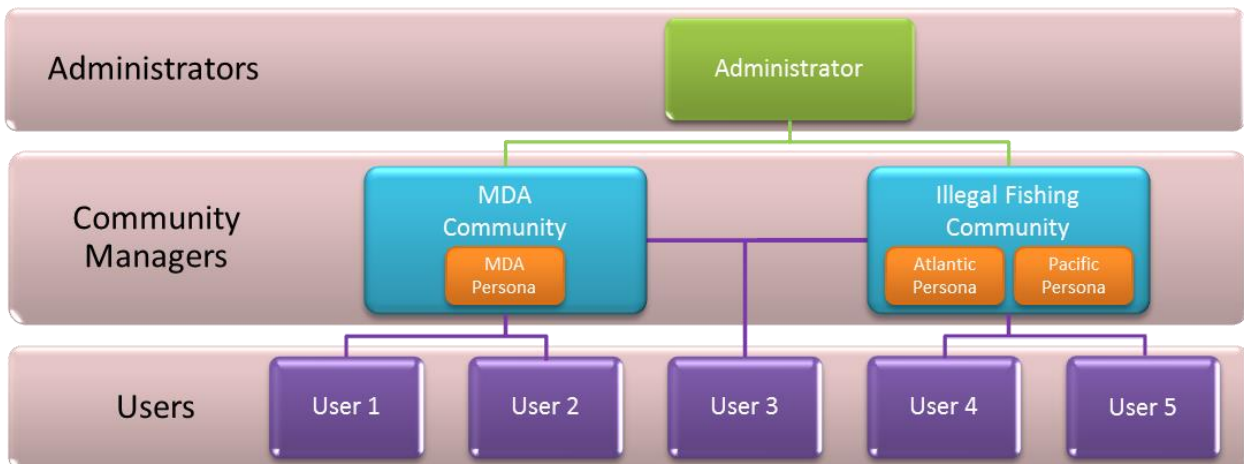


Figure 3: User Management Hierarchy

2. PROJECT ORGANIZATION

The SeaVision project is being sponsored by N2N6E3 and includes SPAWAR Data Engineering Sciences Center (DESC), SPAWAR Systems Center Pacific (SSC PAC), DoT Volpe Center, and COMUSFLTFORCOM. SeaVision has the unique benefit of having two technical teams with varied experience, resulting in the ability for deployment of SeaVision functionality on varied platforms. Figure 4 is an organizational chart showing the relationship of project stakeholders and is described in detail in section 2.2.

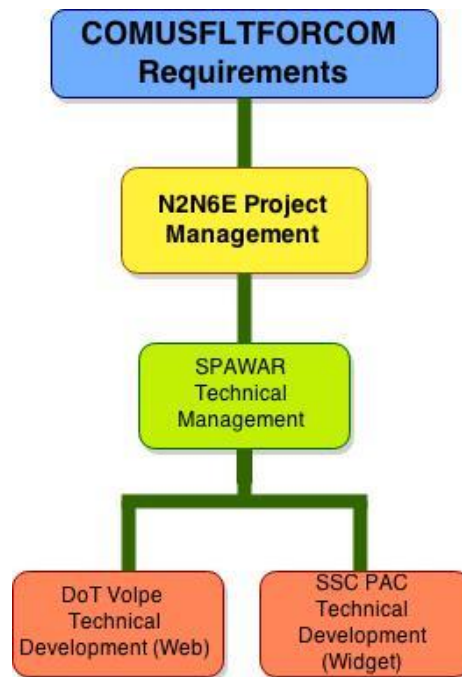


Figure 4: Organizational Chart

2.1. PROJECT STRUCTURE

Improvements to SeaVision will be done incrementally. The first improvements of SeaVision will be derived from the requirements letter from Commander, U.S. Fleet Forces Command to N2/N6 and the resulting COMUSFLTFORCOM's functional gap analysis. Subsequent improvements will be prioritized based on NCC/NFC mission needs, align with Navy and DoD Architectural processes, and will be documented in the SeaVision System Requirements Specification (SRS). N2N6E3 will assist in finding additional government owned capabilities, data, etc. to add to the system to meet future requirements.

2.2. ROLES AND RESPONSIBILITIES

Project stakeholders include COMUSFLTFORCOM, N2N6E3, SPAWAR DESC, SSC PAC, and DoT Volpe Center.

N2N6E (Navy MDA) will act as the office of primary responsibility (OPR). N2N6E will ensure the continued development and improvement of the tool and will provide oversight and guidance to transition the functionality of SeaVision to a Department of Defense/Department of Navy Program of Record (POR).



N2N6E3 will provide project management and oversight for SeaVision and will have responsibility for the business processes and system requirements of SeaVision. N2N6E3 will work directly with COMUSFLTFORCOM to ensure Fleet requirements are captured and documented in the SRS. N2N6E3 will schedule status meetings to track the progress on development and integration and will communicate with stakeholders on progress.

DESC will be responsible for the technical oversight of the SeaVision development teams. DESC will ensure DoT Volpe Center and SSC PAC are aligned and moving forward with requirements outlined in the SRS. Responsibilities also include providing contractual support as needed. DESC will assist development teams in mapping their work to the deliverable schedule and report findings and recommendations to N2N6E3. Additionally, DESC will provide periodic financial and technical status updates and subject matter expertise as needed.

Volpe and SSC PAC will work together to develop the administration and infrastructure, access to data, analysis, information sharing, and analytical capabilities of SeaVision to meet Fleet mission needs. Volpe is responsible for the internet web-based application of SeaVision, while SSC PAC is responsible for development of widgets that encompass SeaVision functionality. Additional specific roles for each of the development teams are as follows:

Volpe is specifically responsible for all development and maintenance for database management. They will act as the Enterprise Administrators and manage user communities and users. Volpe will maintain and manage the pre-defined areas of responsibility (AOR) and exclusive economic zones (EEZ) associated with data. Volpe is responsible for the development and maintenance of both the ad-hoc and advanced search database and interface to include application specific interfaces to databases. They will provide help desk support as well as provide initial and continued training and user support as needed. Volpe is responsible for developing chat functionality as well as output messages in NIEM conformant messages.

SSC PAC is specifically responsible for providing the ability for near real time user defined alert generation and management to include the display of results. They will maintain and manage the warning system which is the result of a system defined rules based scoring system based on the United States Coast Guard Port State Control Safety and Security Vessel Targeting Matrix. SSC PAC is responsible for the management of the user defined rules based scoring system that will result in system notifications. Additionally, SSC PAC is also responsible for the web application to manage and export dynamic KML layers from SeaVision.

COMUSFLTFORCOM will define and communicate Fleet requirements.



3. PROJECT START UP

The SeaVision project kicked off with an extensive two-day technical exchange (15-16 April 2015) to discuss current and future capabilities of SeaVision. Future capabilities will be based on the requirements letter from Commander, U.S. Fleet Forces Command to N2/N6 and the resulting COMUSFLTFORCOM's functional gap analysis between CAMTES and SeaVision. The result of the two-day technical exchange is the System Requirements Specification (SRS). The SRS is a document that specifies mission, functional, derived and system requirements for SeaVision. The requirements in the SRS are prioritized through COMUSFLTFORCOM and other project stakeholders. SeaVision Project management documentation will be distributed to key stakeholders for awareness and transparency of goals and timelines.

3.1. PROJECT DELIVERABLES

The primary deliverable is SeaVision. Integrated and improved capabilities will result in an enhanced user interface and ability to automate the collection of maritime data and process that data against pre-defined business rules. The core capability that SeaVision will deliver will be the ability to integrate information and products from other systems or processes and make that information available to PKI and non-PKI users. Project management documents that will be delivered are the Project Description (PD) and SRS

Initial Operations Capability (IOC) for SeaVision is 1 October 2015. Initial functionality will be demonstrated in July for COMUSFLTFORCOM to ensure all stakeholders are in alignment with direction of SeaVision. User surveys will be utilized to assess progress and status of SeaVision. Final Operations Capability (FOC) will be in FY2016 and will include additional functionality documented in the SRS.

3.2. PROJECT LIFE CYCLE

Incremental improvements will continue after IOC per the SRS to increase functionality and adopt and implement maritime exchange models and processes outline in the National MDA Architecture Plan⁸ and the National Information Exchange Model-Maritime. Regularly scheduled sprints with time based release schedules will be coordinated and agreed upon between the COMUSFLTFORCOM and development teams.

3.3. PROJECT DETAILS

N2N6E3 will work directly with COMUSFLTFORCOM as the single voice for providing requirements from the Fleet leading up to IOC. Post IOC, there will be regularly scheduled user juries and peer reviews for the MOCs as additional capabilities and functionality are incorporated. Additionally, there will be an annual community-wide review of SeaVision. Feedback will be captured and documented for future development. Stakeholders identified in section 2.2 shall review the project plan prior to final delivery.

3.3.1. DATA

⁸ The National MDA Architecture Plan has been approved by the Chief Information Officers from Department of Defense, Department of Homeland Security, Department of Transportation and the Intelligence Community.



While a variety of data sources can be made available via SeaVision, only those identified as “enterprise” data sources within the SRS will be provided as a function of SeaVision. All other data sources will be identified and funded by the requesting Community Managers.

SeaVision will publish and consume data using identified structured information formats. Initial formats include NMEA 0183 (AIS & radar targets), XML (NIEM CVISR) and OTH-Gold . Data can also be exported as KML layers and viewed in other tools.

3.3.2. STANDARDS

Data standards are the key for information sharing. The primary standard used within the DoD is the National Information Exchange Model (NIEM). SeaVision will provide outputs and products in the form of emails, messages and web page updates as well as providing analytical results to partners via NIEM conformant messages.

3.3.3. REQUIREMENTS

The SeaVision System Requirements Specification (SRS) details the mission, functional, derived and system requirements for SeaVision. The requirements listed in the SRS include the description and status, as well as an acknowledgment of the requirement as a present or future capability, the implementation priority, status, release, the implementation risk and general comments. Requirements for IOC and FOC are clearly identified. The SRS will be reviewed and approved by the project stakeholders prior to IOC, and subsequently on a regular basis. As mission needs change, the SRS will reflect changes in requirements.

3.3.4. TRAINING PLAN

SeaVision will be developed to be user friendly and require minimal outside training sources. Volpe will provide user support (ad-hoc, on demand help) that consists of online information pages, online chat, email, or a help desk. Online user support will be in the form of help pages and pop up information boxes. Help desk support (phone, chat, email) will be provided during regular working hours (EST).

Training of SeaVision functionality will be provided by N2N6E3 and members of the SeaVision development teams at each MOC at IOC. This training includes the knowledge and familiarity with SeaVision menu bar and icons. Each MOC is then responsible to train partner MOCs on SeaVision functionality. Additional onsite training on SeaVision functionality is available but is the responsibility of the MOC/Community Manager.

Mission application of the tool will be provided by COMUSFLTFORCOM or other MOCs. Specifically, how SeaVision supports specific operational processes, such as Tactics, Techniques, and Procedures (TTPs) will be the responsibility of the MOC (Community Manager).



4. CONCLUSION

The requirement for a capability to enable the movement, management and sharing of unclassified information outside traditional DoD IT systems has been identified as a fundamental enabler to multiple DoD missions. SeaVision provides an enhanced capability for collaboration, data collection, fusion and analysis, and data dissemination at an unclassified level between the U.S. government, international partners, industry and other organizations to improve maritime operations.

