

# Functional Area 6 - SW Eng. Development, Programming, and Network

**PSI Contract N00167-96-D-0010 DO 66, 82:** NSWCCD developed the Onboard Data Acquisition System (ODAS) for the Large Scale Vehicle (LSV) II Cutthroat. Cutthroat is an autonomous scale model submarine used for hydrodynamic research. It is operated by the NSWCCD Acoustic Research Detachment (ARD) in Bayview Idaho. Cutthroat is fully instrumented with accelerometers, hydrophones, and engineering sensors. The outputs of these sensors are digitized, telemetered, recorded, and uploaded for analysis by the ODAS system.

ODAS consists of three principal parts: the Sensor Network, which digitizes and telemeters the sensor data; the Recorder, which stores the digitized sensor data in real time, and the Interface and Control System, which controls the sensor network and recorder in response to commands from users and the LSV II control system. PSI developed the Sensor Network and Recorder portions of ODAS. We concentrate here on Recorder, as it is a software based data acquisition system and descriptive of our software capabilities.

PSI performed multiple benchmark tests of candidate Recorder hardware platforms prior to making a recommendation to NSWCCD. We also applied Software Engineering best-practices from the beginning of the design. As several organizations interfaced with Recorder, interfaces had to be well designed, documented, and configuration managed to avoid integration problems later. For development, PSI followed our full suite of software engineering practices, which are designed to produce a documentation set consistent with MIL-STD-498 and CMMI Level 3 processes and procedures. Our practices can be scaled to a scope appropriate to the size of a development effort. Recorder development was of a scale sufficient to warrant our full suite of practices and documentation. Our processes typically produce the following set of documentation:

Software Development Plan (SDP)	Software Design Description (SDD)
Software Requirements Specification (SRS)	Software Test Plan (STP)
Interface Requirements Specification (IRS)	Software Test Report (STP)
System/Subsystem Design Description (SSDD)	Software Users Manual (SUM)
Interface Design Description (IDD)	

For Recorder we produced this set of documentation and maintained it under configuration control.

**PSI Contract N00173-02-C-6015:** Working with Navy researchers, PSI acousticians, analysts, and computer programmers designed and developed the Dynamic Ambient Noise Model (DANM), which provides a realistic simulation of the temporal noise field in which a passive receive array operates. DANM uses the noise field to predict the output from various beamforming algorithms of interest to Navy planners. The total noise field is obtained by separately calculating wind and shipping noise. The temporal variability of the noise field is simulated by moving merchant ships along major shipping lanes. Shipping databases provide seasonal information about shipping lanes between the world's major ports, as well as the type and number of ships that move in the lanes. Currently, PSI analysts and programmers are modifying and enhancing the existing HITS Vessel Motion Simulation (HVMS) dynamic shipping prediction system and are upgrading the DANM model to include vertical directionality and moving receiver capability.

**PSI Contract GS-35F-5839H:** PSI provides software design, development, and maintenance support for the Joint METOC Viewer (JMV) and Optimum Path Aircraft Routing System (OPARS) at the Fleet Numerical Meteorology and Oceanography Center (FNMOC) in Monterey, CA. For JMV, Our software engineers provide software support for all JMV programs and are responsible for resolving all reported JMV software flaws and deficiencies. PSI is also responsible for diagnosis and correction of deficiencies and errors in the OPARS software modules. Particular emphasis is on improvement of the OPARS 3.0 Graphical Routing input module, addressing deficiencies in the route selection process, improving the Communications Module, and providing support for installation of the systems Aeronautical Database.

**PSI Contract N00167-02-D-0038 DO 18, 24:** The Naval Surface Warfare Center Carderock Division (NSWCCD) is supporting NAVSEA PMS 401 efforts in the area of Sonar Tactical Decision Aid (STDA) architecture design and evaluation. PSI is supporting NSWCCD by performing interface engineering analysis. The analyses utilize PSI's extensive knowledge of legacy STDAs and Meteorological and Oceanographic (METOC) data sets and services, and experience in what the user community requires. These analyses consist of system architecture definition, user requirements definition, software design and implementation, network interface tool development using XML and SOAP, and acceptance testing support.

**AAC Contract N00024-02-C-6311:** AAC performed the software engineering and development to implement the Surface CAUSS Functional Segment discussed under Functional Area 1. No hardware selection was carried out for this project. It was targeted for the AN/SQQ89 Integrated PRP System (IPS). The IPS system is a flexible system design developed for rapid deployment of technology innovations. Its design is based upon COTS/Mainstream technology including 2.8 GHz Dual Pentium Symmetrical Multiprocessors (SMP), Linux O/S, and ACE/TAO freeware for hardware independent communication/interfaces. AAC performed the design, software engineering, and development necessary to implement this functionality on the IPS system and maintained procedures consistent with CMMI level 3.

***Additional Contracts:***

ASTM Contract DTFT60-01-R-00005, Contact Kenneth Mackel, 202-366-1618

NTI Contract N00167-01-D-0016, Contact S. Finley, 208-683-2321, x4210

AHA Contract N00039-97-C-0031, Contact Loretta Bourne, 619-524-7154

AHA Contract N00024-96-C-6231, Contact Richelle Sweeney, 703-885-7765

AHA Contract N00024-98-D-8124, Contact Peter Troll, 443-778-5312

AHA Contract N00024-00-C-4125, Contact Tom Higgins, 202-781-2892

CTI Contract DTTS59-00-D-00823, Contact Dave Moore, 202-708-0614