

# Predictive Analysis for Naval Deployment Activities (PANDA)

## PROGRAM DESCRIPTION

Predictive Analysis for Naval Deployment Activities (PANDA) is DARPA's Web-based system designed to help analysts understand normal and historical vessel behavior, predict future behavior, and identify anomalies in current or past behavior. PANDA can provide situation awareness on tens of thousands of maritime surface vessels in support of U.S. maritime domain awareness by automatically learning motion-based patterns of normal vessel behavior from long-duration tracks and correlated data, building and preserving analysts' knowledge about normal vessel behavior, detecting deviations from normal behavior patterns and alerting analysts to these deviations, predicting future motion behavior based on past normal behavior – facilitating “What should I expect from this track if it continues as normal?” analyses, and incorporating context to help analysts prioritize – and enrich understanding of – vessel deviations.

PANDA provides support to maritime domain awareness user tasks by:

- Improving decision-making and accuracy of threat detection
- Improving understanding of normal and anomalous vessel behavior
- Enhancing situation and threat awareness
- Focusing attention towards new vessels of interest (VOIs)
- Reducing user's workload



## APPROACH

PSE contributed to the PANDA program by ensuring that the system was built to accommodate the characteristics of its user population, and to support the mission requirements of its intended operational commands. PSE assisted with the PANDA development process by:

- Developing a concept of operations (CONOPs) through baseline assessments with SMEs, users, and USN Fleet personnel to determine how PANDA capabilities would be used;
- Providing human factors feedback recommendations for PANDA system improvement;
- Developing training materials for the PANDA system, including quick reference guides and detailed step-by-step user manuals;
- Conducting assessments of the PANDA system at operational exercises (Trident Warrior 08) and via user juries and operational evaluations, iteratively throughout the system's development;
- Providing support to demonstrations of PANDA from an operationally-relevant perspective highlighting features and functions of significant value to users;
- Providing other assistance and products as part of the overall program support throughout Phases I, II,

## IMPACT

The contributions provided by PSE enhanced the PANDA interface and ensured that the system provided the right capabilities to its intended users. Additionally, the assessments conducted by PSE helped to both quantify the benefits provided by PANDA and provided recommendation for changes and additions to later versions, which ultimately led to an improved, more operationally-useful system.

This effort was sponsored by Defense Advanced Research Project Agency (DARPA).

