



# TADMUS to SEA



The *Tactical Decision Making Under Stress* (TADMUS) project is sponsored by the Office of Naval Research (ONR) with basic and applied research as well as advanced development thrusts (6.1 – 6.3). The project is applying emerging theories of cognition and models of decision making to the Navy's C4I requirements. Based on the research, Space and Naval Warfare Systems Center, San Diego (SSC-SD) is developing real-time decision support, while NAWC-TSD is developing improved training to improve tactical decision making and facilitate reduced manning. The TADMUS Decision Support System (DSS) is presently a stand-alone system developed for laboratory research in tactical decision making. It is currently being adapted to the needs of Third Fleet in supporting Joint and Coalition battle group operations. The DSS will utilize the C4I datalinks and infrastructure currently being installed aboard the USS Coronado. The system development and ultimate performance evaluation is being conducted as part of the TADMUS to Sea program.

**Background.** The TADMUS project was spawned by the 1988 USS Vincennes incident where an Aegis cruiser engaged in a littoral warfare peace-keeping mission shot down an Iranian Airbus. Investigations following the incident suggested that stress may have affected decision making, and that these effects were not well understood. The TADMUS project was established to address these concerns.

SSC-SD developed a prototype DSS to enhance Navy tactical decision making based on “naturalistic” decision processes. Displays were developed to support critical decision making tasks through recognition-primed and explanation-based reasoning processes, and cognitive analysis was conducted of the decision making problems faced by Naval watch officers operating in a shipboard Combat Information Center. Baseline testing in high intensity, peace keeping, littoral scenarios determined that experienced decision makers were not well served by current systems, and their performance suffered from periodic loss of tactical situational awareness.

DSS research showed that when tactical decision makers had the prototype DSS available, there were significantly fewer communications to clarify the tactical situation, significantly more critical contacts were identified earlier, and a significantly greater number of defensive actions were taken against imminent threats. These findings suggest that the prototype DSS enhanced the commanders' awareness of the tactical situation, which in turn contributed to greater confidence, lower workload, reduced errors in adherence to rules of engagement, and more effective performance. Significant work remains to be done in learning how to optimally design and train users of such systems.

Based on this research, the DSS is being adapted to meet the needs of battlegroup decision makers performing Joint and Coalition missions. Objectives for this project include: developing a model of decision making in Joint and Coalition operations, performing necessary systems engineering to make the DSS fully functional with JMCIS, TADIL-J, etc., and conducting a shipboard evaluation study to validate the utility of the DSS in this environment.

**TADMUS on the Internet:**

[www-tadmus.nosc.mil](http://www-tadmus.nosc.mil)

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