Raytheon

Ship Self-Defense System (SSDS)

A Combat Management System for When Seconds Count

Surface ship combat management system for protection against anti-ship cruise missiles

Benefits

- Expedites the threat-detection-to-weapon-engagement process
- Integrates state-of-the-art existing and future sensors and weapons
- Extensible across multiple ship classes and export approved
- Provides multi-warfare situational awareness (air, surface, undersea and land)
- Implements U.S. Navy Open Architecture Computing Environment standard for lower total cost of ownership and enhanced flexibility, scalability, compatibility and upgrade capability
- Ensures centralized, positive control for the effective release of weapons
- Employs weapons using automated and commanding officer-controlled doctrines

The Threat

Around the world, navy ships protect national security by being the first line of response in forward-presence and power-projection missions. Naval forces must be able to sail "in harms way" and survive.

Anti-ship cruise missiles (ASCMs), such as the subsonic (Mach 0.9) and supersonic (Mach 2+) low altitude missiles, are the principle air threats in the U.S. and in many other countries. They are lethal — highly capable of destroying naval surface ships. Detection, tracking, assessment and weapon engagement decisions to combat these air threats must be made quickly from the time of detection to weapon engagement.

Solution

Raytheon's Ship Self-Defense System (SSDS) is an open, distributed combat management system for surface ships designed to expedite the detect-to-engage sequence to defend against ASCMs. SSDS links and automates stand-alone sensors and weapon systems to provide the required combat reaction. A fiber optic local area network (LAN) connects ship sensors and weapon systems to

- coordinate sensor integration;
- identify and evaluate potential threats;
- assess readiness of ship defenses; and
- execute specific tactical procedures.

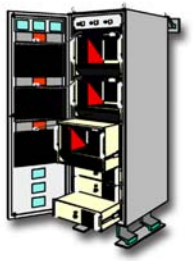
While SSDS incorporates a high degree of automation through computerized embedded doctrine, the system also allows the commanding officer to maintain positive control over selected doctrine and weapons release.

Proven Technology

SSDS is designed for use in aircraft carriers and expeditionary ships. In operation for over a decade, SSDS is fielded on four classes — LSD, CVN, LPD and LHD — and will be available on LHA class ships in the future. SSDS is in service on USS Ronald Reagan, USS Nimitz, USS San Antonio, USS New Orleans, USS Makin Island and over a dozen more.

Ship Self-Defense System (SSDS)

Open/distributed modern COTS architecture



Extensibility across multiple ship classes

State-of-the-art integration of existing and future sensors

Design

- Object-oriented, open, distributed architecture
- Fiber-optic LAN links ship sensors and weapon systems
- Commercial programming languages (C++)
- Mainstream COTS hardware
- Extensibility across multiple ship classes
- Fleet operator validated human machine interface

Capabilities

- Multi-warfare situational awareness (air, surface, undersea and land)
- Battle management command and control
- Doctrine-controlled automatic detect through engage
- Layered ship self-defense
- Identification and evaluation of potential threats to the ship and force
- Full tactical data link interoperability and CEC integration
- Combat system readiness assessment
- Positive control over weapons release
- Full team training on board, in port or at sea

The SSDS System

Consisting of software and commercial off-the-shelf (COTS) hardware, SSDS integrates radar systems with anti-air weapons, both hard kill (missile systems and rapid fire gun systems) and soft kill (decoys).

The SSDS MK 2 systems are designed to interoperate within and beyond the carrier or expeditionary strike group through the Cooperative Engagement Capability (CEC) and tactical data links (4A, 11 and 16), which gather, fuse and display the resultant coherent track picture for ship operators and force commanders.

Radar, electronic support and IFF sensors integrated with SSDS directly or through CEC, include AN/SPS-67, AN/SPS-48E, AN/SPS-49A(V)1, AN/SPQ-9B, AN/SPS-73, AN/SLQ-32 and AN/UPX-29.

Weapon systems integrated with SSDS include the AN/SLQ-32 Electronic Attack System, NULKA (Anti-Ship Missile Decoy System), Phalanx Close-In Weapon System, Rolling Airframe Missile, NATO SeaSparrow Missile System and the Evolved SeaSparrow Missile.

Open Architecture

SSDS has migrated to Category 3 U.S. Navy's Open Architecture Computing Environment (OACE) standard. All SSDS components, both hardware and software, meet the OACE standard. The open architecture enables third-party system integration and the ability to leverage commercial technology improvements.

In 2008, SSDS will be the first surface ship combat management system to be placed in service with an open architecture configuration. In addition, SSDS components are planned for use on LCS class ships and on the DDG 1000 Zumwalt Class Destroyer, which is the U.S. Navy's next-generation, multi-mission naval destroyer.

Raytheon Company
Integrated Defense Systems
50 Apple Hill Drive
Tewksbury, Massachusetts
01876 USA

www.raytheon.com

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