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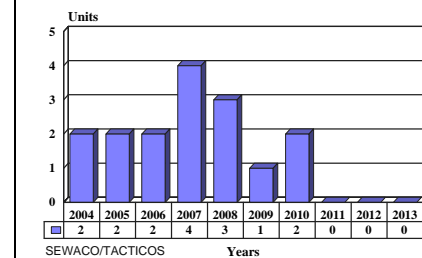
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SEWACO/TACTICOS - Archived 11/2005

Outlook

- Forecast International projects navies worldwide will purchase some 16 TACTICOS combat management systems over the next decade
- In 2006, look for the first of six Hellenic Navy S-frigates to receive a TACTICOS combat management system

10 Year Unit Production Forecast
2004 - 2013



Orientation

Description. SEWACO-FD is a building concept for naval combat systems developed by Thales Nederland. The core element of the concept is the combat management system TACTICOS. TACTICOS allows all sensors and weapon equipment to be integrated in one comprehensive system. TACTICOS provides the command team with command and control of all resources, tactical command support, and full weapon control.

Sponsor

Thales Nederland B.V.
7550 GD Hengelo Ov.
The Netherlands
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Web site: <http://www.thales-nederland.nl>

Status. In production and service.

Total Produced. A total of 166 systems are estimated to have been built through 2003.

Application. Combat management.

Price Range. From known values of equivalent systems, Forecast International approximates the price will range between US\$2 million and US\$8 million.

Contractors

Thales Nederland, <http://www.thales-nederland.nl>, Haaksbergerstraat 49, Hengelo, 7554 PA Netherlands, Tel: + 31 74 2488111, Fax: + 31 74 2425936, Prime

Technical Data

Design Features. A SEWACO system is composed of the following elements:

- Primary radar sensors (for long-, medium-, and short-range air and surface warning radar);

- Secondary radar sensors (such as Identification Friend or Foe);
- Helicopter transponders; and
- ESM and IR sensors.

The heart of SEWACO is the modular Digital Action Information System (DAISY). DAISY is assigned to present raw or digitized information from primary or secondary radar sources. DAISY compiles and presents tactical air, surface, and subsurface pictures to assist in mission operations.

The DAISY system is composed of a data-handling cabinet and a number of display consoles. The cabinet contains the data-handling computer, a sensor data distribution unit, and one or more video extractors.

Two types of display consoles are available, a vertical (VDC) and a horizontal (HDC) type. The VDC is equipped with a 7-inch alphanumeric display for presentation of alphanumeric data in tabular form. The HDC is equipped with one or two 7-inch or 15-inch displays. The main display unit for both types is a 40-centimeter labeled position display or a 40-50 centimeter unit. Communication with the data-handling

unit is via manual input keyboards, quick-input keyboards, rolling balls, and handwheels. Other input systems such as light pens and touch-input can be integrated.

Sets of system tasks are defined as system functions (logical subsystems). Every system function is handled by a data communications network having high-speed databases and direct communications, and an intelligent communications handling package. Fail-safe and fail-soft facilities are provided through duplication of critical parts, while parts of the complex are decentralized to achieve optimum damage control.

The display subsystem consists of Signaal general-purpose high-resolution tactical (SIGHT) workstations (color-raster scan type). Different types of data sources can be simultaneously displayed. Optical disks are used for storage of maps, manuals, and procedures. The workstations enable multiple systems, and each workstation can be used for any system function within the defined security limits of a given operator. Any SIGHT workstation can also control the integrated internal and external communications systems.

Variants/Upgrades

SEWACO I. SEWACO I was developed for the Tromp-class guided missile frigates, and integrates the primary search radar with the WM-25 fire control system and the Signaal ESM system.

SEWACO II. SEWACO II was developed for the Kortenaer class frigates. It integrates the data input of the LW.08 and ZW.06 radar with the WM-25 fire control radar.

SEWACO IV. SEWACO IV is the designation for the SEWACO variant supplied with the Belgian Wielingen class frigates. It integrates the output of a Signaal DA.05 radar and WM-25 fire control system with NATO Sea Sparrow and Exocet missiles.

SEWACO V. SEWACO V was designed for the mid-life refit of the Van Speijk class frigates. It integrated the LW.02 and DA.05 radar with a 76mm Oto Melara cannon, Harpoon missiles, and ASW weaponry.

SEWACO VI. SEWACO VI is a version of the SEWACO II system used on the Van Heemskerck class frigates. It includes facilities for the control of Standard SM-1MR missiles, three STIR radars, the Sphinx ESM system, and the Goalkeeper close-in weapon system (CIWS).

SEWACO VII. This variant is a major upgrade of the SEWACO concept. SEWACO VII is a heterogeneous, mixed-architecture system that uses different types of computer systems, with different operating systems.

Dual or triple redundancy is employed on all essential subsystems. SEWACO VII has two DEC Minivaxs for management information and support, four Signaal SMR-4 computers, and six Motorola 68030 micros for pre-processing, sensor management, and bus interfacing. These are connected via a triply coaxial Ethernet databus with up to 256 32-bit channels and a TV/infrared video network linking the GOS workstations.

SEWACO VIII. SEWACO VIII has been optimized for installation on submarines.

SEWACO IX. This version is the mine warfare derivative of SEWACO used on the Dutch Tripartite minehunters.

SEWACO XI. SEWACO XI is the air-warfare-oriented command system. In effect, SEWACO XI is an air defense module that can be interfaced with other command systems for a fully transportable product.

SEWACO XII. SEWACO XII is SEWACO XI added to SEWACO VII.

STACOS. STACOS is the designation given to a number of export derivatives of various SEWACO configurations.

SEWACO-FD. This current, fully distributed version of the SEWACO command system is now being promoted on the export market. It offers distributed processing

power to meet requirements for increased availability, simplified system reconfigurations, and extensions.

Within SEWACO-FD, geographically distributed computers, or nodes, are logically and physically connected in a local area network. Nearly all subsystems and each MOC-Mk 2 connected to the system databus contain such a node. Together, these nodes form the virtual machine on which the TACTICOS command and control software package

runs. TACTICOS System Management decides which part of TACTICOS runs on which node. The decision is based on the availability, occupation, and degree of the nodes.

TACTICOS. TACTICOS is a new command system that was designed by combining the best features of the Thomson-CSF (now Thales) TAVITAC 2000 and Signal STACOS systems.

Program Review

Background. Signaal (now Thales Nederland) developed the first SEWACO system for the Royal Netherlands Navy Tromp class frigates.

In 1995, Signaal received an order for three SEWACO-FD systems for a group of Yildiz class Fast Attack Craft (FAC). Also in 1995, Signaal received four more orders from Indonesia to equip that country's NAV-V FAC-M. In 1997, Turkey awarded Thales Nederland a contract to combine the radar with TACTICOS on the first four of the Turkish Navy's 13 Dogan-class fast patrol boats.

On January 13, 2000, Thales Nederland announced it had signed a contract with the Hellenic Shipyard Company for the delivery of equipment to be installed on four new gunboats to be built for the Hellenic Navy. The TACTICOS combat management system is one of the systems included in the sale.

In September 2000, VT Group Plc (formerly called Vosper Thornycroft) and Thales Nederland signed a contract for the delivery of equipment, which includes the TACTICOS combat management system, for three fast attack guided missile craft for the Hellenic Navy. In October 2000, Thales Nederland received a contract for the delivery of the entire combat system, which includes the TACTICOS combat management system, for four new fast patrol boats for the Turkish Navy.

On July 31, 2001, Poland and Thales Nederland signed a contract for the modernization of the three Orkan class

corvettes with the Polish Navy. The contract integrated the TACTICOS combat management system on board the Polish Navy's three Orkan class corvettes.

In February 2003, Thales Nederland signed a contract with Hellenic Shipyards to modernize six Hellenic Navy S-frigates (with an option for two more). Under the agreement, Thales will upgrade the operational capabilities of the frigates with the emphasis on fire control equipment and the TACTICOS combat management system. Forecast International expects the first frigate will receive a TACTICOS combat management system sometime in 2006. Look for the sixth frigate to receive its TACTICOS system in 2009.

Recent Activity. In November 2003, Thales Nederland announced it received a contract from VT Shipbuilding to supply its SEWACO-FD Combat System (which includes the TACTICOS Combat Management System) for two Roussen-class (Super Vita) Fast Attack Craft to be built for the Hellenic Navy. In that same month, Thales Nederland announced it received a contract from Elefsis Shipbuilding to supply its TACTICOS Combat Management System for four Hellenic Navy 62m Combattante III Fast Attack Craft. Forecast International expects the first TACTICOS Combat Management System will be delivered in mid-2006. Look for Thales Nederland to deliver the remaining three TACTICOS Combat Management Systems from 2007 to 2008.

Funding

SEWACO/TACTICOS customers provide funding for the systems.

Recent Contracts

<u>Contractor</u>	<u>Award (US\$ millions)</u>	<u>Date/Description</u>
Thales Nederland	287.45	Feb 2003 – Thales Nederland signed a contract for the Mid-Life Upgrade of six Hellenic Navy S-frigates, with an option for two more. Under the contract, Thales will upgrade the operational capabilities of the frigates, with the emphasis on fire control

<u>Contractor</u>	<u>Award (US\$ millions)</u>	<u>Date/Description</u>
Thales Nederland	52.0	Nov 2003 – Thales Nederland receives a contract from VT Shipbuilding to supply its SEWACO-FD Combat System for two Roussen-class Fast Attack Craft to be built for the Hellenic Navy. The SEWACO-FD includes a Thales Nederland TACTICOS Combat Management System.
Thales Nederland	Unknown	Nov 2003 – Thales Nederland receives a contract from Elefsis Shipbuilding to supply its TACTICOS Combat Management System for four Hellenic Navy 62m Combattante III Fast Attack Craft. The first Combattante III will receive the TACTICOS Combat Management System in mid-2006, with the other three receiving the TACTICOS Combat Management System at six-month intervals starting in mid-2006.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1974	SEWACO ordered for Spanish Descubierta frigates and Belgian Wielingen frigates
	1975	SEWACO II ordered for Dutch Kortenaer frigates
	1976	SEWACO V ordered for Dutch Van Speijk frigates
	1977	SEWACO II ordered for Greek Elli frigates
	1978	SEWACO ordered for Egyptian El Suez frigates and Nigerian <i>Aradu</i> frigate
	1979	SEWACO ordered for Dutch Walrus submarines and Moroccan <i>Errhamani</i> frigate
	1980	SEWACO ordered for Argentine Almirante Brown and Espora frigates
	1981	SEWACO II ordered for Dutch Heemskerck frigates
	1985	SEWACO VII ordered for Dutch Karel Doorman frigates
	1987	SEWACO ordered for Portuguese Da Gama frigates
	1991	SEWACO ordered for Turkish 2nd flight Yavuz frigates and Yildiz class FAC-M
	1992	SEWACO-FD ordered for Omani and Qatari corvettes
	1993	SEWACO-FD ordered for Turkish MEKO 200/2B frigates
	1994	TACTICOS ordered for Indonesian PB 57-type large patrol boats
	1997	TACTICOS ordered for first four Turkish Dogan-class fast patrol boats
Jan	2000	Thales Nederland signs a contract to install its TACTICOS combat management system on four new gunboats to be built for the Hellenic Navy
Jul	2001	Thales Nederland signs a contract to provide its TACTICOS combat management system for the Polish Navy's three Orkan class corvettes
Feb	2003	Thales Nederland signs a contract to upgrade six Hellenic Navy S-frigates (with an option for two more) with its TACTICOS combat management system
Nov	2003	Thales Nederland announces a contract to supply its SEWACO-FD for two Roussen-class (Super Vita) Fast Attack Craft to be built for the Hellenic Navy

Worldwide Distribution

SEWACO/TACTICOS systems have been procured by the following countries: **Argentina, Bangladesh, Belgium, Egypt, Finland, Germany, Greece, Indonesia, South Korea, Malaysia, Morocco, the Netherlands, Nigeria, Oman, Peru, Portugal, Qatar, Taiwan, Thailand, Turkey, and the UAE.**

Forecast Rationale

SEWACO-FD is a building concept for naval combat systems developed by Thales Nederland. The core element of the concept is the combat management system TACTICOS. TACTICOS allows all sensors and weapon equipment to be integrated into one comprehensive system. It provides the command team with command and control of all resources, tactical command support, and full weapon control.

As indicated by the **Ten-Year Outlook** chart, Forecast International projects navies worldwide will purchase some 16 TACTICOS combat management systems over the next decade. Upgrades to Greek and Polish ships are driving TACTICOS system procurements.

The TACTICOS combat management system has a high degree of automation for surveillance, recognition, identification, data fusion, situation assessment, and engagement actions. All this cuts down on “human error.”

Additionally, the modularity of the system’s hardware and software elements makes it suitable for any size platform: from a large frigate to a stand-alone Link 11 console. The system’s modularity also makes upgrades to the TACTICOS relatively easy.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Designation	Application	Thru 03	High Confidence Level			Good Confidence Level			Speculative			Total 04-13	
			04	05	06	07	08	09	10	11	12		13
SEWACO/TACTICOS	FFG/DDG/GUN BOATS (GREECE)	20	1	2	2	4	3	1	2	0	0	0	15
SEWACO/TACTICOS	FFG/PCFG (POLAND)	2	1	0	0	0	0	0	0	0	0	0	1
SEWACO/TACTICOS	Prior Prod'n:	144	0	0	0	0	0	0	0	0	0	0	0
Total Production		166	2	2	2	4	3	1	2	0	0	0	16