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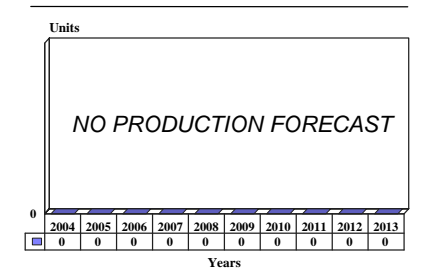
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SQS-510 - Archived 6/2005

Outlook

- No further production seen at this time
- Potential market to Greece, India, and the Netherlands, but extremely speculative
- This report will be archived in June 2005

10 Year Unit Production Forecast
2004 - 2013



Orientation

Description. The SQS-510 is a medium-frequency active/passive sonar designed for either hull-mounted or variable depth configuration.

Sponsor

Canadian Department of National Defence
Director General
Defence Research Establishment Atlantic
PO Box 1012
Dartmouth, Nova Scotia
Canada B2Y 3Z7
Web site: <http://www.drea.dnd.ca>

Licensees. No known licensed production has been authorized.

Status. In service; limited production possible, but unlikely.

Total Produced. An estimated 32 SQS-510 sonar systems are believed to have been produced through June 2004.

Application. Anti-submarine warfare (ASW).

Platform. The SQS-510 is installed on destroyer- and frigate-size surface combatants.

Price Range. Estimated price believed US\$666,666 based on the 1997 contract to Belgium for three systems; however, this may have been a price for upgrading from the SQS-505, which has many of the same components as the SQS-510.

Contractors

General Dynamics Canada, <http://www.gdcanada.com>, 3785 Richmond Road, Ottawa, K2H 5B7 Ontario, Canada,
Tel: 1 (613) 596-7000, Fax: 1 (613) 820-5081, Email: wwwinfo@gdcanada.com, Prime

Technical Data

Design Features. The SQS-510 is a medium-frequency active/passive sonar designed for either hull-mounted or variable depth configuration. It incorporates Computing Devices' UYS-501 digital signal processor and UYQ-501 SHINPADS (Shipboard Integrated Processing and Display System) dual-screen display system with signal and control processors. As a

result, it replaces the control, display, and receiving elements of the SQS-505 and is considered by some to be a redesigned version of the same.

The SQS-510 provides surface units with simultaneous active and passive digital signal processing, display processing, and computer-aided detection. It helps in

rapidly detecting and localizing active and broadband passive contacts.

The detection and tracking system of the sonar on the version sold to Belgium provides the operator with 72 active receive beams and can display up to 16 tracks.

The system also contains a shore playback capability in order to carry out post-mission analysis off-site.

Operational Characteristics. The SQS-510 can be configured as a hull-mounted or variable depth sonar (VDS) system, either as the prime sensor or as a complementary sensor to the SQR-501 Canadian Towed Array (CANTASS) system. In addition to SHINPADS, the SQS-510 can also be integrated with other standard multifunction displays rather than special sonar displays or indicators.

The sonar is optimized for performance in either shallow water submarine detection, mine avoidance, or torpedo detection missions. The system is controlled from a dual-screen operator's console. Both processed active and passive data are displayed on the high-resolution digital color monitors. Sophisticated CAD and algorithms alert the operator of active and passive contacts. Additionally, passive alerting is provided in both active listen states.

Performance of the system can be monitored under operational conditions, one option being to use Lockheed Martin Canada's performance figure measurement system for sonars.



SQS-510 Medium Frequency Active/Passive Sonar

Source: General Dynamics Canada (formerly Computing Devices Canada)

Variants/Upgrades

SQS-510(V)4. This is the version contracted for installation on the Canadian Iroquois class destroyers and presumably the one on the Halifax frigates as well. The version on the Halifax is in hull-mounted mode, while the Iroquois has both hull-mounted and VDS modes.

It is not known whether this is also the one fitted on the Belgian Wielingen class as part of its mid-life upgrade (MLU).

Program Review

Background. Development of the system started in 1982 under a contract with the Canadian Department of National Defence (DND). This development included the manufacture of two production units and extensive three-and-a-half-year sea trials. The sea trials were conducted aboard the HMCS *Nipigon*.

The SQS-510 is essentially an upgrade of the SQS-505 as installed on each of the four Iroquois class destroyers; the upgrading process, known in Canada as the 510 Project, lasted from 1993 to 1996.

In 1995, the Canadian government issued a requirement for SQS-510 sonar system, considering it an extension of the SQS-510 Project. An Advance Contract Award

Notice (ACAN) was issued, presumably in 1995, naming the original equipment manufacturer as the proposed contractor. Of the Improved Restigouche class frigates, only the HMCS *Terra Nova* is known to have the SQS-510 with certainty. In the Annapolis class, the HMCS *Nipigon* also houses the 510 (as an upgrade, as with the *Terra Nova*).

In Portugal, the SQS-510 is in active operation on the three Vasco da Gama class frigates (essentially German-made MEKO 200s). The Portuguese Navy had also planned to install the system on all four of its Comandante João Belo class frigates which were scheduled for a major modernization, but severe budget restraints put this plan on hold. Reports are that some of these ships have SQS-510s and others have Thales (formerly Thomson-CSF) DUBA 3A hull-mounted sonars. It is possible that the upgrading had not been carried out in full, and only those platforms that have been modernized now feature the Canadian-made system.

The wet end of the SQS-510, known as the SQS-505, is currently in service with the navies of Canada, Belgium, Greece, India, and the Netherlands; the SQR-501 appears limited to Canada. There could be some long-term prospects for the SQS-510 if these navies decide to update the SQS-505, providing that adoption of the SQS-510 remains a cost-effective option.

In 1997 Belgium announced an upgrade to SQS-510 standard for the equipment found on its Wielingen class (Type E-71) frigates. These ships were built in the mid-1970s, and, thanks to the comprehensive MLU program that lasted from 1998 to 2002, they should remain operational until 2010-2012. On the Wielingens, the SQS-505 wet-end transducer and power supply are retained. The SQS-510 detection and tracking system is coupled to the SEWACO IV combat management system's Digital Action Information System (DAISY) software. The first system reportedly underwent sea trials aboard the BNS *Wielingen* during 1999. System testing on the second ship of the class, BNS *Westdiep*, took place in May 2000.

Funding

This program was originally funded by the Canadian Department of National Defence in conjunction with then-Computing Devices Canada, which is now General Dynamics Canada.

Recent Contracts

No recent contract awards have been identified through public sources.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1982	Canadian DND issues an RFP for a new sonar
	1884	New sonar introduction
Jan	1987	Portugal orders the system for its patrol frigates
	1990	Three systems to Portugal; follow-up orders in subsequent years as the modernization of the João Belo class frigates progresses
	1993	SQS-510 Project starts in Canada
	1994	Upgrade of Iroquois class SQS-505s
Nov	1995	Dispute in Canada over need for Iroquois class 510(V)4 upgrade contract
Dec	1995	Canadian government reaffirms its commitment to eight systems on the Iroquois
Mar	1997	Belgium begins modernizing Wielingen class frigates, including their sonars, to SQS-510 standard

Worldwide Distribution

Belgium. On three Wielingen class frigates, upgraded from SQS-505.

Canada. On the Improved Restigouche class frigate HMCS *Terra Nova* and the Annapolis class HMCS *Nipigon*; two sets each on the four Iroquois class destroyers; also installed on the 12 Halifax class frigates.

Portugal. On three Vasco da Gama class frigates, and three or four João class frigates.

Forecast Rationale

General Dynamics Canada's SQS-510(V) is a medium-frequency active/passive sonar. Future sales appear unlikely at this time. The only known users for the moment are Belgium, Canada, and Portugal and all appear to have the latest SQS-510(V)4 model. There is

a slight potential for sales to countries still using the earlier SQS-505 model. The SQS-510 is reportedly an enhanced version of the SQS-505 and is a less expensive option to an entirely new sonar suite.

Ten-Year Outlook

No production is forecast, therefore the forecast chart has been omitted. Barring a sudden surge of activity, this report will be archived next year, in June 2005.

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