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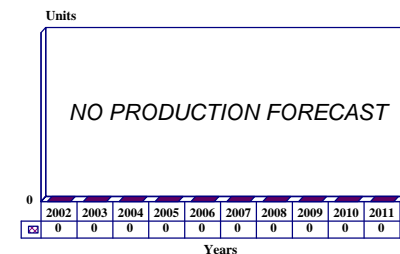
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SQQ-14(IT) - Archived 05/2003

Outlook

- No further production predicted
- SQQ-14(IT) is being replaced by the SQQ-32
- This report will be archived next year, May 2003

10 Year Unit Production Forecast
2002 - 2011



Orientation

Description. High-frequency, variable-depth sonar (VDS) for minehunting.

Sponsor

Ministero Della Difesa
Sottosegretario di Stato
Piazza Della Marina
Lungotevere A da Brescia
I-00196 Rome
Italy
Tel: +39 6 3600964

Contractors

Fabbrica Italiana Apparecchiature Radioelettriche SpA (FIAR)
FIAR Advanced Processing
Centro Direzionale Commerciale
Palazzo F 8/9
Milano Fiori 20090 Assago
Milan
Italy
Tel: +39 28245
Telex: 312832
(Prime contractor for Italian Navy program)

Thales Underwater Systems
(Formerly Thomson Marconi Sonar)
Redfields Industrial Park
Church Crookham
Fleet
Hampshire GU13 0XX
England
Tel: +44 (0) 1252 851485
Fax: +44 (0) 1252 851449
Web site: <http://www.tms-sonar.com>
(Type 2048 route scanning sonar)

Status. In operational service. The SQQ-14(IT) now superseded by SQQ-30, which in turn is being replaced by the SQQ-32. No additional production expected at this time.

Total Produced. An estimated total of 16 complete systems or upgrade packages are believed to be in operational service.

Application. The SQQ-14(IT) is a minehunting VDS with search, classification, and route survey capabilities for Italy's Lerici and Gaeta class minehunter/sweepers, and for Belgium's Aggressive class ocean mine

sweepers. The main mission is search and classification of ground mines, with the system providing the means to deal with current and envisaged threats in waters down to 150 meters in depth.

Price Range. The SQQ-14(IT) sonar was estimated to cost US\$5.5 million, including development costs (based on the last known original 1986 contract with Italy).

Technical Data

Characteristics	<u>Search Mode</u>	<u>Classify Mode</u>	<u>Route Survey</u>
Operation freq	80 kHz	350 kHz	80 kHz
Field of view	90 deg sector	18 deg sector	Port/starboard
Resolution			
Azimuth	1.5 deg	0.3 deg	
Range	2.4 ft	3 in	
Transmitter pulse	1.0 ms	0.1 ms	
Pulse power	15 kW	15 kW	
Acoustic level	126 decibels	125 decibels	

Design Features. The SQQ-14(IT) is a beam-steered dual-frequency VDS with a curve face projector, line array hydrophones, and modulation scanning designed primarily to detect seabed mines. To meet the operational needs of modern mine countermeasures, a MNSL Type 2048 speed scan unit is used in conjunction with the sonar search system for route survey, issuing a printout of the received seabed data. The two operators can simultaneously detect and classify mines. When stowed, the SQQ-14(IT) can be used as a hull-mounted system.

The SQQ-14(IT) system has several modules. The basic subsystems are a search console, classification console, remote bridge display, route survey unit, transmitter cabinet, depth and test control indicator, chain hoist, test transducer, towed body, and towing eye. Built-in test equipment (BITE) continuously monitors the entire system, wet and dry. More detailed BITE facilities are provided for use when the system is off-line. These can verify the sonar's dynamic acoustic performance using prerecorded defined input test signals with the aid of a test transducer unit. Functional test sequences are programmed via a keyboard installed on the search console, while the procedures are monitored on the console display. A status data replica is shown on the depth and test indicator in the maintenance room.

Operational Characteristics. The SQQ-14(IT) can be used in all sea states and all weathers. It also can be used to vector a mine neutralization vehicle to the target for marking and/or destruction. During approach, the vehicle locator system activates a marker, which is shown on the sonar search display. Once the primary beam has illuminated the vehicle, the sonar carries out precise vectoring, to which the vehicle responds via its

transponder. The operation can be accurately monitored on the sonar display.

The SQQ-14(IT)'s four operational modes are classify, search and classify, emergency, and side-scan. In search mode, the system carries out a narrow beam electronic scan of a sector 90 degrees in azimuth, featuring Plan Position Indicator (PPI) display. The field may be automatically slewed through 180 degrees using port, amidships, or starboard centering using one of three range scales (250, 500, or 750 meters). Resolution in azimuth is 1.5 degrees, and a range resolution of typically 0.7 meters may be obtained. When deployed as a VDS, the sonar may be streamed down to 45 meters below the ship, allowing the detection of targets down to 60 meters in depth.

Display is in the form of a bright, flicker-free TV picture. To cross into the classification mode, the target, already designated in search mode, is brought within the 250 meter range gate. When this is achieved, the search and classify cursors are keyed to the target and the sonar is switched or slaved to the classify mode. The operator can then expand the picture on a dual option basis (1.8 m/cm or 0.7 m/cm) for a detailed target investigation. Stability and clarity of target picture are maintained by the electronic scanning in azimuth of an 18 degree sector using a 0.3 degree narrow beam, together with azimuth stabilization of the VDS. Up to four sonar echo returns are selectable, allowing differing views of the target for greater accuracy in classification. A recording of the proceedings allows playback from memory.

The search and classification mode may be engaged while the operator is classifying a target. This is done independently around the 18 degree classification sector and is limited to 90 degrees in azimuth while the

classification mode is in use. This type of operation involves the use of two consoles, one for classification and one for search. Emergency mode is an option provided in the event of a console failure. Target detection, classification, and side-scan can be carried out in sequence from the remaining work station as selected by the operator.

The final mode of operation is the side-scan mode, which is used for route survey operations where a speed

scan unit extracts sonar echoes contained in the receiver beam emitted by the search sonar. Analysis of the ensuing data printout enables optimization of classification methods to suit seabed conditions, as well as a guide to the most suitable minehunting strategies and clearance techniques. The speed scan may be operated in the local mode or remotely, in conjunction with the computer-based Action Information Organization (AIO) minehunting system.

Variants/Upgrades

SQQ-14. Original model.

SQQ-14(IT). Enhanced upgrade of the SQQ-14. The SQQ-30, while based on the SQQ-14(IT) as a

foundation, is a completely different and more advanced system. In many cases the SQQ-14(IT) has been replaced with the SQQ-30, which in turn is starting to be replaced with the SQQ-32.

Program Review

Background. The SQQ-14(IT) program arose out of an Italian Navy analysis of future mine countermeasures requirements in the 1960s. As a result, older ships were modernized with new equipment, while new ships (the Lerici and Gaeta classes) were designed and built. A variable-depth sonar (VDS) was sought in the US, and seven minesweepers of the Castagno class (ex-US Adjutant class) were equipped with General Electric's SSQ-14 VDS (later the SQQ-14 program went to Lockheed Martin) built under license by FIAR. These seven ships, survivors of a class of 18, were refitted with the SQQ-14 by the end of 1982.

In 1982, the Italian Ministry of Defense awarded FIAR a contract to study the feasibility of incorporating modern technology into the SQQ-14 VDS, while also designing improved man/machine interfaces for the existing SQQ-14 systems on the Castagno class. In 1984, the Italian Navy opted for a limited redesign of the SQQ-14 system. This encompassed a new dry end, complete update of the electronic design, introduction of on- and off-line BITE facilities, compatibility with training/simulation programs, introduction of new functions including memory display and side scan, and a new modular design philosophy.

This program, designated P2072 (SQQ-14(IT) VDS), began in 1985. Ten systems were ordered in late 1985 for the Lerici and Gaeta classes. The Castagno class was considered too old to receive the system and has now been discarded. The SQQ-14(IT) VDS entered production in early 1987.

Construction of the six Gaeta class minehunters began in September 1989, with the final ship of the initial production batch completed in 1994. FIAR reportedly finished production of the six sonar systems for these ships in late 1989. A further pair of Gaeta class MCMVs were ordered in early 1992 and commissioned by the end of 1996.

These developments represented the current activity in this program. No further indications have surfaced regarding additional contracts for either complete sonars or upgrade packages, although the system continues to be promoted on the export market. It is doubtful there will be additional sales of the SQQ-14(IT), as more advanced sonars are now available. This report will be archived next year in May 2003.

Funding

Development and procurement of the first 10 systems was financed by an Italian government contract, valued at ITL72,000 million (US\$55 million in 1986 dollars).

Recent Contracts

No recent contracts have been publicly identified.

Timetable

<u>Year</u>	<u>Major Development</u>
1982	FIAR awarded update contract for SQQ-14
1984	FIAR awarded dry-end redesign for SQQ-14
1986	Italian Defense Ministry places order for SQQ-14(IT)
1987	Gaeta class minehunters ordered
1996	Last Gaeta class commission for Italy

Worldwide Distribution

The SQQ-14(IT) is still operational in Belgium and Italy. Some predecessor SQQ-14 models are believed to be still in service for such countries as China and Saudi Arabia.

Belgium: 4 systems on Aggressive class ocean minesweeper
Italy: 4 systems on Lerici class minehunter/minesweeper
 8 systems on Gaeta class minehunter/minesweeper

Forecast Rationale

The market for the SQQ-14(IT) Variable Depth Sonar used for minehunting is now over. The system itself has been seeing a lot of replacement by the more advanced SQQ-30 sonar, which in turn is starting to be replaced by the SQQ-32 sonar. There is very little chance that further orders for the SQQ-14(IT) will be placed. The Italian Navy (one of the prime users of the SQQ-14 system) is expected to order additional minehunters, but not until later in the forecast period. By this time, it is expected that a new class of sonars will be incorporated.

Two other navies, those of Malaysia and Nigeria, have procured Lerici class ships; however, neither is using the SQQ-14(IT). Malaysia uses the Thomas (now known as Thales Underwater Systems) TSM 2022 with Display 2000 aboard its four ships. Nigeria has two Lerici class minehunters/sweepers which also use the TSM 2022.

As no additional procurement for the SQQ-14(IT) is predicted, the Ten-Year Outlook has been omitted. Provided there is no further activity for this system, this report will be archived next year in May 2003.

Ten-Year Outlook

The forecast chart has been omitted. This report will be archived next year in May 2003.

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