

SHIP CONTROL SYSTEMS

Integrated manoeuvring control,
platform systems management and monitoring

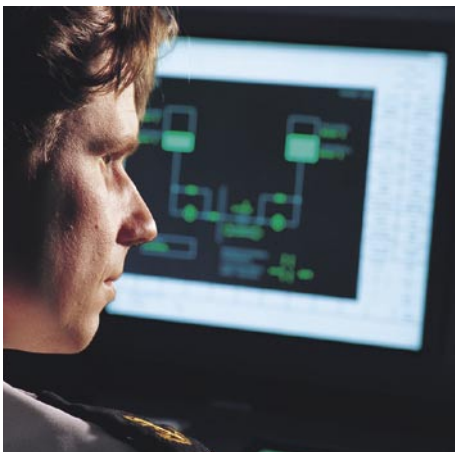


Saab has been involved in ship control systems since the 1970s, when the first of Saab's one-man "swim-by-wire" manoeuvring control systems was designed and fielded for the Royal Swedish Navy's Näcken class submarines. Saab ship control systems were also fitted to the Västergötland class and later to the Royal Norwegian Navy's ULA class submarines.



This concept was expanded for the SCS-500 system with the integration of platform systems monitoring and management. Based on this expanded concept, Saab was awarded the contract to provide the integrated ship control, management and monitoring system for the Royal Australian Navy's Collins class submarines.

The most recent development is the new SCS-500 Mk2 system, a new generation which takes full advantage of Commercial-Off-The-Shelf (COTS) hardware and software technologies.



The cost of ownership and the need for reduced manning present a significant challenge for today's naval architects. The SCS-500 Mk2 meets this challenge through the provision of high levels of automation and the use of commercial components, where suitable. This proven and fielded integrated ship control, management and monitoring system is suitable for submarines as well as surface combatants and is highly adaptable for different types of ships and platform equipment.

As a result of the high level of integration, reliability, flexibility and automation provided by the system, crew sizes have been significantly reduced. A good example of this is the Collins class submarine, where the crew size has been reduced to 42 men and women, as compared to the 64 men on its predecessor, the Oberon class. This is despite significant increases in the number and complexity of submarine systems and hence operational capability.



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Operational Advantages

For submarine use, manoeuvring control has been integrated with the ship's management and monitoring functions. The manoeuvring functions allow several modes of control from fully automatic to manual and emergency modes. Manoeuvring capability is fully redundant and all critical functions are always available through independent manual and emergency operations.

Control and monitoring is distributed throughout the platform using redundant networks and computer systems. This feature greatly enhances safety, helps maintain functionality under severe damage conditions and ensures that failures only impact a small section of the system.

The SCS-500 Mk2 provides computer-assisted and automated functionality for the control, management and monitoring of manoeuvring, power, habitability and auxiliary platform systems.

The system is built around a network of computers that have been developed using industry standard VME and CPCI technology, linked together via a ship-wide, redundant Ethernet.

Data is shared in a distributed real-time database and presented on multiple general control consoles (GCCs) that provide the primary interaction between the operator and the system. The platform system sensors, actuators and local dedicated process controllers are connected to distributed control units (DCUs) located throughout the

platform. A local control console can be attached to each DCU to provide full control and monitoring of all local functions.

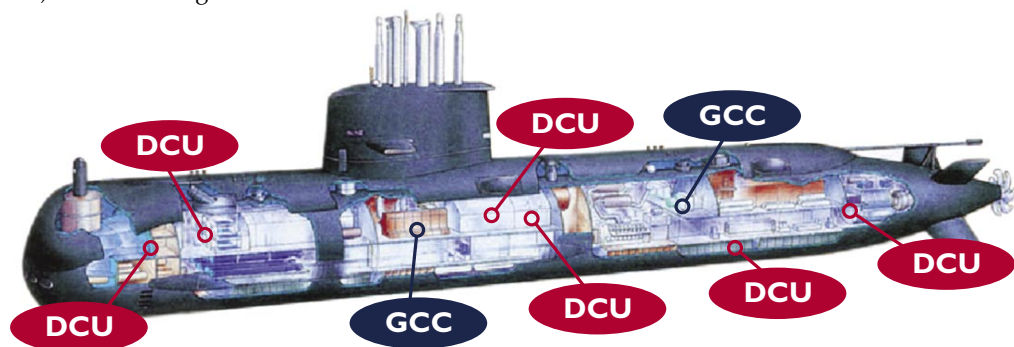
In addition, the SCS-500 Mk2 supports an electronic notice board service. Electronic ships notice boards can be distributed freely throughout the ship providing a means to communicate important information to all crew.

Other features include a mode for management and monitoring via a portable shore terminal or via fixed installation terminals at home base. This mode allows one operator to manage and monitor one or more ships, thereby relieving ship's crew of monitoring tasks when alongside.

End user involvement is essential for achieving the best possible operator and systems performance.

The human machine interface can be readily customised for each type of ship by using software tools to define the display layouts and to later test the effectiveness of these layouts.

Saab's knowledge in the area of ship control systems and its recognised skill and experience in the application of COTS software and hardware, offers cost effective solutions for ship control management and monitoring.



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