rexroth
A Bosch Company

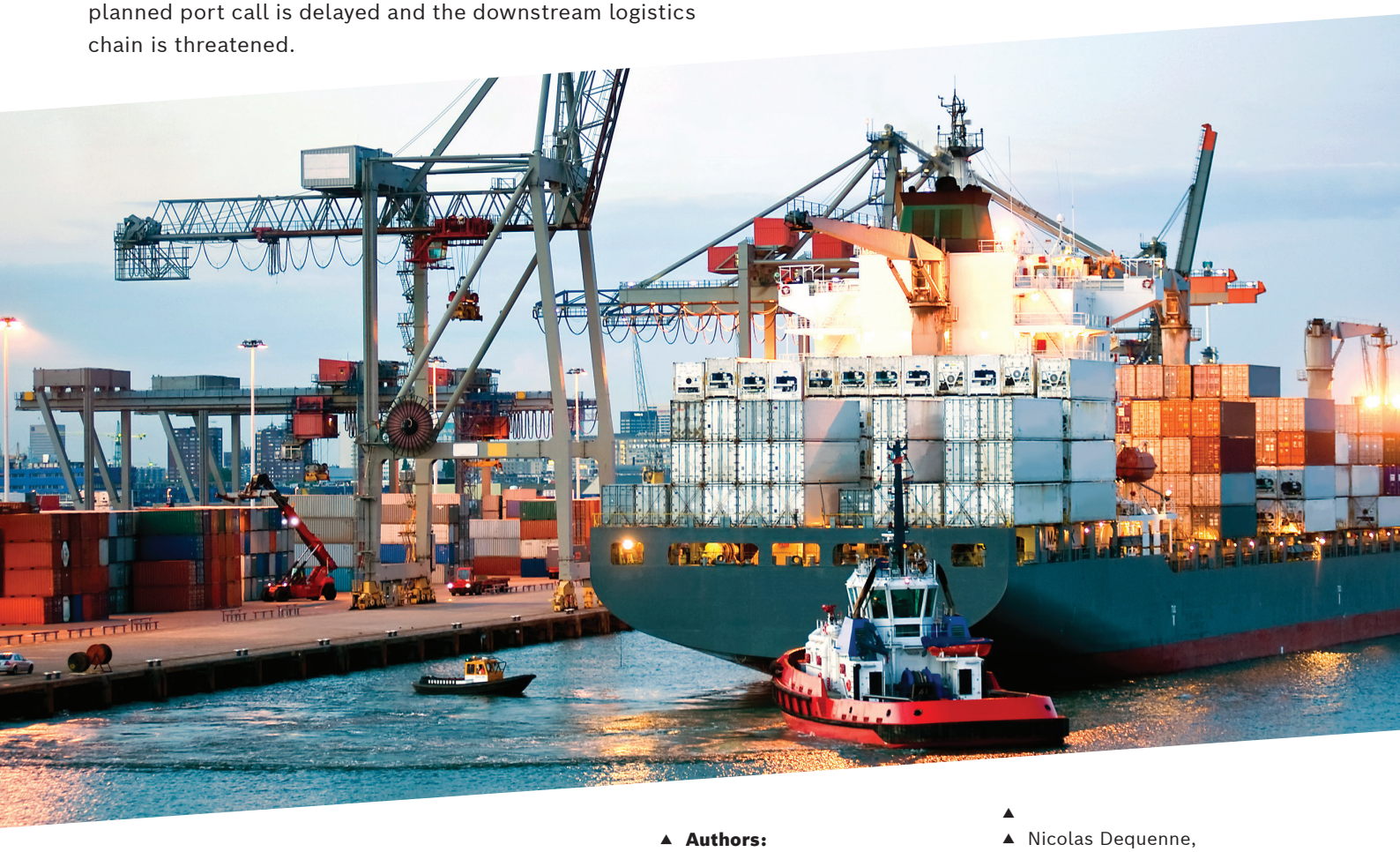
Docking service for marine hydraulics

WORLDWIDE, IN ORIGINAL QUALITY AND WITH FULL COST CONTROL

How can the effort and costs of hydraulics maintenance be reduced when a number of sister ships have to dock at different yards one after another? This project approach not only eases the burden on fleet managers and superintendents – it also minimizes the liability risk for the ship operator.

Hydraulic components are among the most critical parts in 2-stroke diesel ship engines. If they break down, the planned port call is delayed and the downstream logistics chain is threatened.

In a worst-case scenario, the ship is unable to maneuver and therefore represents a hazard for people and the environment. To ensure that none of these scenarios occurs, the technical coordinators at shipping companies do all they can to carry out maintenance as effectively as possible in line with the manufacturer's specifications. But the superintendents are under considerable economic pressure, too. How can their work be made easier? How can it be ensured that ships leave on time? And how can the costs of maintenance work be determined before a ship actually docks?



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THE PROBLEM: MAINTAINING SHIPS AT DIFFERENT LOCATIONS AT THE SAME TIME

During their day-to-day work, fleet managers and superintendents would like to see the following situation simplified: a number of ships with the same machinery, e.g. a MAN ME Type B or C, are due for a hydraulic overhaul in accordance with the original specification. The A4VSO axial piston pumps for the oil supply and the FIVA servo valves in the ships' engines[1] have been operating for roughly the same number of hours. The problem is that dockings usually take place over a period of two to three weeks, with one week for repairs according to the docking schedule. Because the maintenance has to be done near the shipyard, the person responsible for maintenance must enlist various repair companies. This common practice poses a number of risks: lost time, unpredictable costs, uncertain quality and a great deal of administration and coordination work.

THE SOLUTION: WHY NOT ENLIST A SERVICE PARTNER WITH A GLOBAL NETWORK?

A better way to have the work carried out is to use a service partner with a global network and a one contact person who coordinates the work. In order to ensure unlimited machine availability, the original specification of the hydraulic components should be adhered to and the complete unit should then be covered by a new parts warranty. In order to provide a convincing service, the following requirements must be met:

- **Central coordination with work carried out in a synchronized manner around the world**
- **Adherence to the schedule with minimal management effort**
- **Full cost control with fixed prices**
- **Certified quality for maximum availability and safety**
- **Low liability risk for the owner**

1 Further information regarding the maintenance of FIVA valves can be found in the article "Sail the world's oceans without a care." [Link]

▼ **A global supply of original spare parts : The Rexroth Marine Service distribution center in Nuremberg, DE and regional Rexroth-certified repair centers**

PRACTICAL PROJECT APPROACH

In order to address the typical problems and risks of dockside hydraulic overhauls, Bosch Rexroth has developed a universal project approach which has gone down well with the technical coordinators at shipping companies. The aim of the tried-and-tested concept is to minimize the great management effort through central coordination and carrying out the required maintenance work in a synchronized manner. In order to minimize the liability risk for the operator, Bosch Rexroth has set up a global network of certified repair centers. Each Rexroth Marine Service Center is situated close to the particular port, carries original spare parts and upgrade kits and replaces overhauled assemblies even during a subsequent port call[1].

This way, the manufacturer's specification is adhered to at all times. The project approach with tiered service packages from the Marine Service Portfolio ensures cost transparency and low overall costs. The customer is offered all modules for a set price in advance.

1 Further information: White paper "High performance like on day one: Why hydraulics must be repaired the original way." [Link]

PROOF OF CONCEPT IN ASIA

The following real example shows how a global synchronized docking project is carried out: A shipping company is faced with the challenge of organizing the ten-year docking for ten container ships. The freighters will arrive at three different Chinese shipyards every three to four weeks. All the ships have MAN ME C engines, each with five A4VSO hydraulic pumps of the type HS3 or HS4. According to the manufacturer's specification, 50 pumps need to be overhauled. Most of the pumps have been in operation for 64,000 hours, while others have only been operating for 32,000 hours. The remaining HS3 pumps should be replaced with the current HS4 generation during the docking.
In order to first clarify all basic data and requirements, the Rexroth coordinator initially spoke to the fleet manager and his superintendents. The project plan which is drawn up on a joint basis specifies that the overhauls should be carried out by the local Rexroth Marine Repair Centers while the ships are docked near Shanghai and Guangzhou. The centers should also provide logistics support.
The cycle starts with so-called "seed pumps".This are already re-manufactured pumps. At the first docking these pumps are exchanged, overhauled by the local Rexroth Marine Repair Center and stored ready to be installed on the next ship. If necessary, the HS4 upgrade sets along with the overhauled pumps can be sent to the shipyard so that they too can be installed during the docking.

Job

- Hydraulic overhaul of ten ships with a total of 50 A4VSO pumps (HS3 and HS4)
- Upgrading from HS3 to HS4 at the same time

Challenges

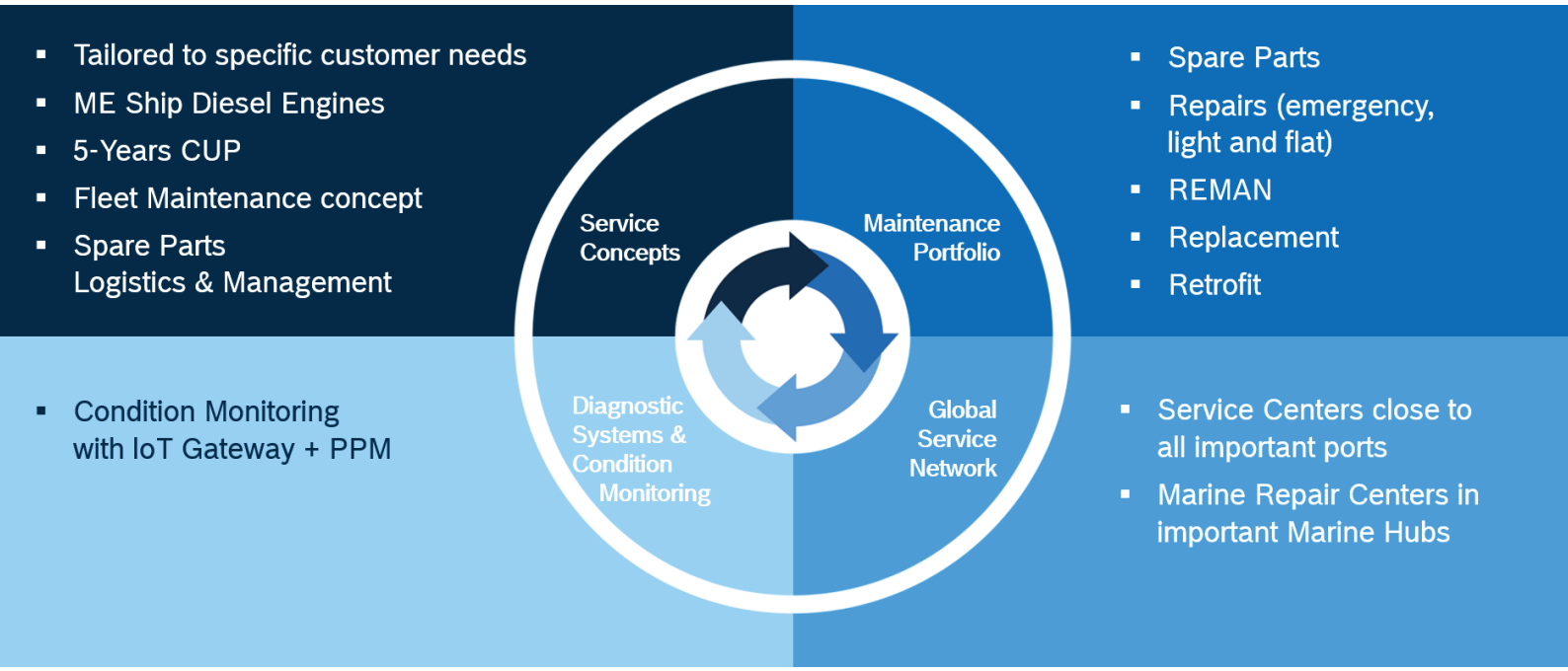
- Coordinating and synchronizing the work centrally
- Overhauling components for a fixed price and distributing costs between the individual ships
- Manufacturer's specification and exclusion of liability
- Spontaneous changes to the docking plan

Solution

- Project approach for synchronized docking services
- Central coordination, "One Face to the Customer"
- Replacement pumps with new parts warranty
- Use of port calls for replacing parts
- Original repairs and original spare parts

FIXED PRICES AND COST DISTRIBUTION

Bosch Rexroth carried out the upgrades and gradually overhauled all pumps for a fixed price, as a result of which the fleet manager could distribute the budget evenly between all ships. This way, the customer's maintenance budget was used evenly.
The Bosch Rexroth project manager considerably reduced the administrative burden by coordinating not only all activities but also the various Rexroth branches in China, the customer's country and Germany. Thanks to the sound project planning, clear communication channels and great flexibility, it was also possible to cope with spontaneous changes to the docking plan if two ships needed to be overhauled at the same time.
In light of the convincing overall performance, the customer was very happy and subsequently placed an order for another ten dockings.



▲ **The Marine Service from Bosch Rexroth covers the complete hydraulic life cycle with original quality, is highly flexible and reduces the administrative burden.**

SAFETY AT SEA

With the new project approach for docking services, Bosch Rexroth meets the needs of ship owners and superintendents including all legal and regulatory requirements on the basis of a global portfolio of maintenance services. The hydraulic experts use dock time and port calls flexibly and thus set a new service benchmark in the large engine market which covers the entire life cycle of the components and optimizes maintenance costs in line with the manufacturer's specification and the specific requirements of the shipping company. All stakeholders benefit from a highly effective solution which saves time and reduces costs while meeting the most important requirement for smooth operations, namely uncompromising machine availability over the entire life cycle!

SAFETY AT SEA: REXROTH MARINE SERVICE

Global, fast and cost-effective: The Rexroth Original Service meets the requirements of ship operators and superintendents while reducing the administrative burden as much as possible and minimizing overall costs. In the brochure "Safety First Service for Hydraulics in 2-Stroke Diesel Engines", you can find out how you could benefit. [Link to the brochure]

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