

SEAWATER INTAKE CLEANING SOLUTIONS

Environmentally friendly and safe seawater intake cleaning solutions with minimal plant downtime





Seawater Intake Cleaning Solutions Remotely Operated Cleaning Machines

Proven technology for uninterrupted desalination plant operations

Ensuring the optimal performance of desalination plants, power plants, and other facilities dependent on seawater processes demands pristine seawater intake systems. Marine growth poses significant operational risk, potentially compromising overall plant capacity.

Conventional cleaning methods present notable drawbacks. Dependency on diver-based approaches not only poses safety hazards but also entails substantial plant downtime. Moreover, chemical treatments, such as chlorine usage, pose ecological threats upon discharge into marine ecosystems.

As experts in underwater equipment design and construction, Seatools offers cutting-edge remote cleaning technology solutions to address these challenges effectively. Through the utilization of remote cleaning machines, seawater intake channels undergo rigorous cleaning during routine maintenance intervals, ensuring minimum flow resistance during operation. Notably, dewatering of tunnels is unnecessary during cleaning operations.

Seatools' remote cleaning solutions offer the following benefits:

- **Minimal Operational Disruption:** Marine growth is swiftly removed during planned outages, facilitated by highly efficient cleaning principles and automation, independent of operator expertise.

- **Maximum Safety:** Driverless cleaning operations eliminate risks associated with diver exposure to hazardous environments, ensuring plant and personnel safety.
- **Environmental Sustainability:** Mechanical cleaning operations avoid the use of harmful chemicals like chlorine, which, when discharged into the sea, can disrupt ecosystems and harm aquatic organisms.
- **Controlled Waste Management:** All waste is gathered and conveyed to a designated disposal site for further processing. This ensures that debris does not reach the plant's intake filters.
- **Real-time Feedback:** Equipped with state-of-the-art sensor technology, cleaning vehicles offer immediate performance feedback and can conduct post-surveys, guaranteeing the thoroughness and efficacy of the cleaning operations.

In summary, Seatools' cutting-edge remote cleaning solutions redefine maintenance for desalination and power plants, offering a host of unparalleled benefits. From minimizing operational disruption and maximizing safety to promoting environmental sustainability and enabling controlled waste management, our technology ensures seamless operations while safeguarding ecosystems and enhancing efficiency.

Case Study Successful Application of Breakthrough Cleaning Technology at the Black Point Power Station

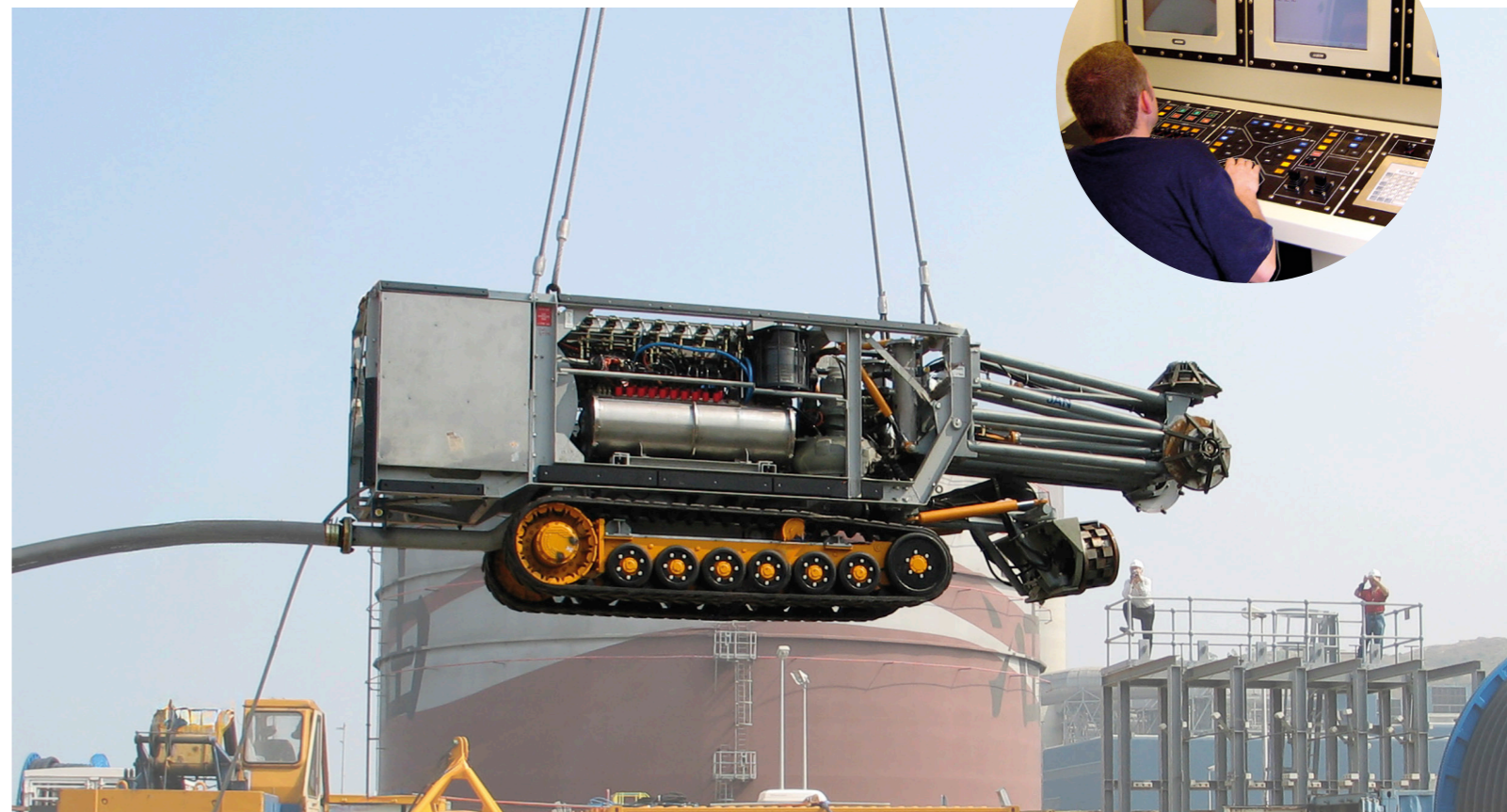
Safeguarding Power Plant Capacity with Efficient Remote Cleaning Machine Solution

As part of a major overhaul project at Hong Kong's Black Point power plant, the cooling water intakes were set to be cleaned. These square-shaped intakes had experienced significant (bio-)fouling, which led to increased wall roughness and a reduction in the inner pipe diameter. Consequently, the decrease in available cooling capacity resulted in head loss, reducing the overall power plant capacity.

thick layer of marine growth (mussels) within a minimum time span. During the development stage, Seatools developed and tested various cleaning principles before selecting a scraper-based principle for the final design of this highly automated cleaning machine. Within a short timeframe, the remotely operated machine successfully cleaned a 400-meter-long tunnel, showcasing its efficiency

The end customer's main concern – to perform the cleaning job safely and at a minimum power plant downtime – required the design of a dedicated underwater cleaning machine. Its task: to remove and transport the 25-centimeter-

Project scope: Design and delivery of two complete autonomous cleaning machines including power supply and control container
Project duration: 9 months







Seatools Company Profile

A Team of Specialists

Founded in 1999, Seatools was established by a team of specialists with a wealth of experience in underwater technology. From the outset, Seatools' core activity lies in the design and manufacturing of industrial-quality subsea equipment. This ranges from individual sensors to sizable subsea equipment, including Remote Operated Vehicle (ROV) spreads.

Based in the Netherlands, Seatools serves the following worldwide markets:

- Offshore renewables
- Dredging
- Deep-sea mining
- Offshore oil and gas
- Civil underwater

Approach



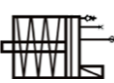

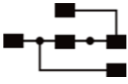




Generally, the markets that we serve are characterized by a high capital intensity, challenging conditions, and 24/7 operations at remote locations. To align with these conditions, our approach is based on two fundamental principles: multidisciplinary and first-time-right.

Multidisciplinary

We believe that only a multidisciplinary engineering approach will deliver innovative and high-quality, custom-made solutions in a time frame that serves our clients. This means we accommodate all required engineering disciplines in house. We are able to combine disciplines in an effective way and provide customers with one-stop subsea solutions.

First-time-right

In the capital intensive industries that our clients operate in, elaborate on-site testing or experimenting is out of the question. To ensure proper functioning, rapid commissioning, and quick start-up of our subsea equipment solutions, Seatools adopts a first-time-right philosophy which relates to a variety of deeply-rooted principles and routines which guarantee our solutions are first-time-right.

 Techno-economic and feasibility studies	 Mechanical design	 Hydraulic engineering
 Electrical engineering	 System simulations and control system engineering	 Software engineering
 Project management	 Manufacturing, assembly, and testing	 Commissioning, training, and operating our services

Clients
Equipping industry leaders





seatools

Seatools B.V.
Edisonstraat 67
3281 NC Numansdorp
The Netherlands
Tel. +31 (0) 186 68 00 00
www.seatools.com
info@seatools.com

UNDERWATER SPECIALISTS