

# PILE RECONDITIONING COFFERDAM SYSTEM





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The Pile Reconditioning Cofferdam System (PRCS) is designed to refurbish piles in the splash zone. This zone is located between the layer and high water line.

With this process, the economic life of a jetty can be extended by a minimum of 30 years. Lots of jetties were built in the last century and little to no maintenance has taken place until today. The existing coating is mostly faded or damaged. This gives corrosion the chance to easily cause a lot of damage in and around the piles of the jetty.

There has never been a system to place the piles dry up to at least 2 meters below water level, until now. Boskalis has effectively created a 'semi-submersible cofferdam' which makes this possible. By placing the cofferdam around the pile and pumping the water out, a conditioned space arises where work can be carried out easily in a safe and secure way.

Advantages of the PRCS are:

- Easy pile inspections
- Hydrojet cleaning with 3,000 bar
- Repair of any damage
- Effective application of the new coating
- Quality and optimal safety control
- Dry weld repairs and NDT inspection
- Long-term corrosion protection
- Environmentally friendly solution

PRCS system around a jetty pile at low tide.

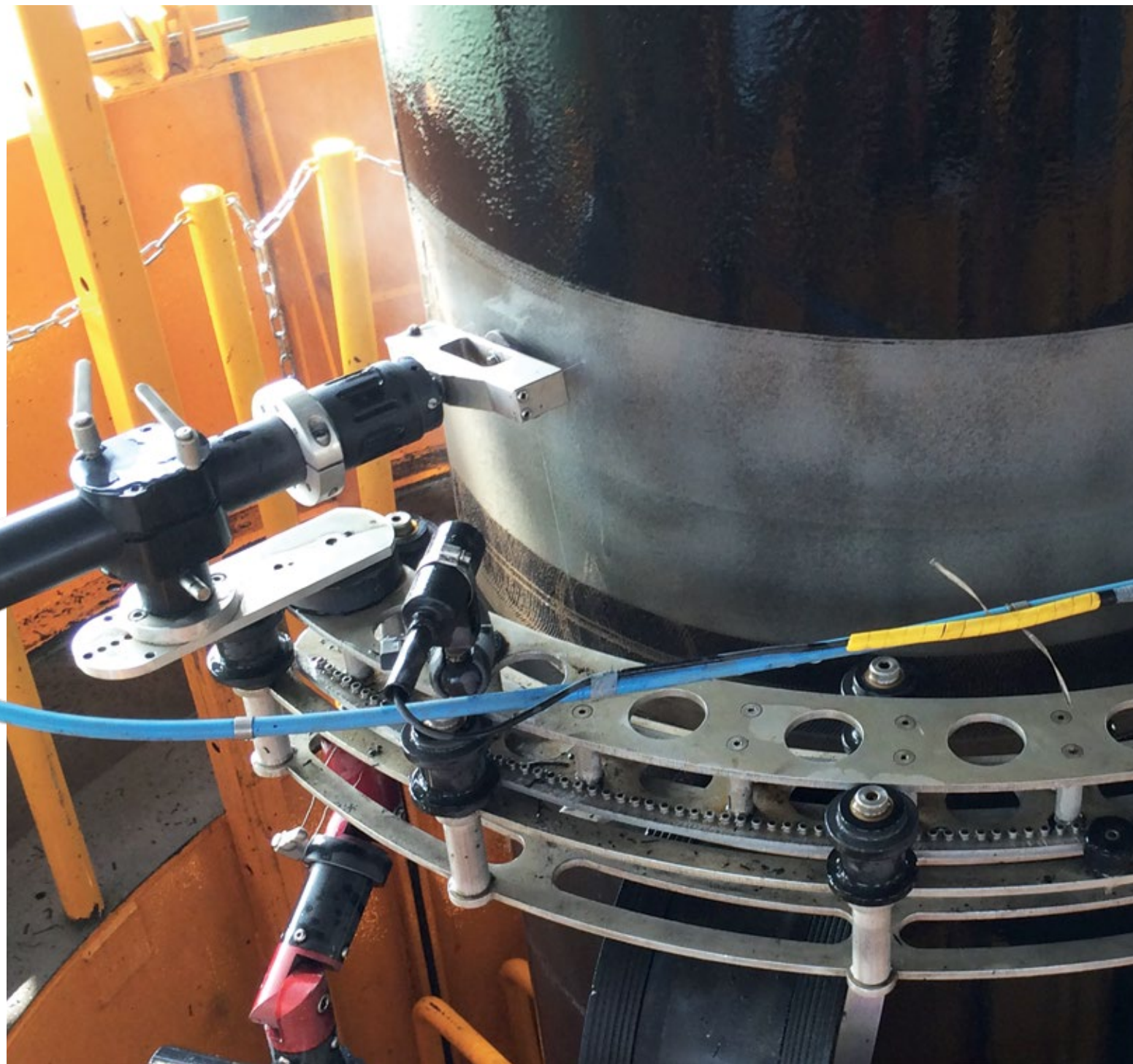


# COFFERDAM WORKING METHOD

BOSKALIS ALWAYS WORKS IN AN ENVIRONMENTALLY FRIENDLY MANNER. WATER IS SEPARATED FROM THE DIRT DURING THE CLEANING PROCESS AND THE COATING THAT IS COLLECTED IS DESIGNATED CHEMICAL WASTE AND DISPOSED OF VERY CAREFULLY.

Before the cofferdam can be placed, the pile first has to be cleaned of marine growth. Seaweed, which often includes oysters and mussels, can be up to 30 cm thick. It is crucial that the pile is completely clean, otherwise the cofferdam cannot become water-resistant when attached.

After the inspection and cleaning operation, the cofferdam is attached around the pile and hydraulically closed. Divers then attach a clamp structure underwater. After installation, the multipurpose tool Dive Ultra Safety Blaster (DUSB), which has also been developed in-house, can be installed inside the cofferdam. This tool starts removing the old coating with a water pressure of up to 3,000 bar. During this process, the used water and the removed wasted coating are pumped out and collected in a disposal container where the dirt gets separated from the water. Afterwards, the collected coating is disposed of as chemical waste, to minimize the impact on the environment.



The Ultra High Pressure Pipe Cleaning robot is designed for vertical and horizontal steel pipe cleaning and hydra blasting operations. Produced by Vertiblast, the equipment works particularly well with the cofferdam method. This strong combination ensures that there is no pollution of the environment.

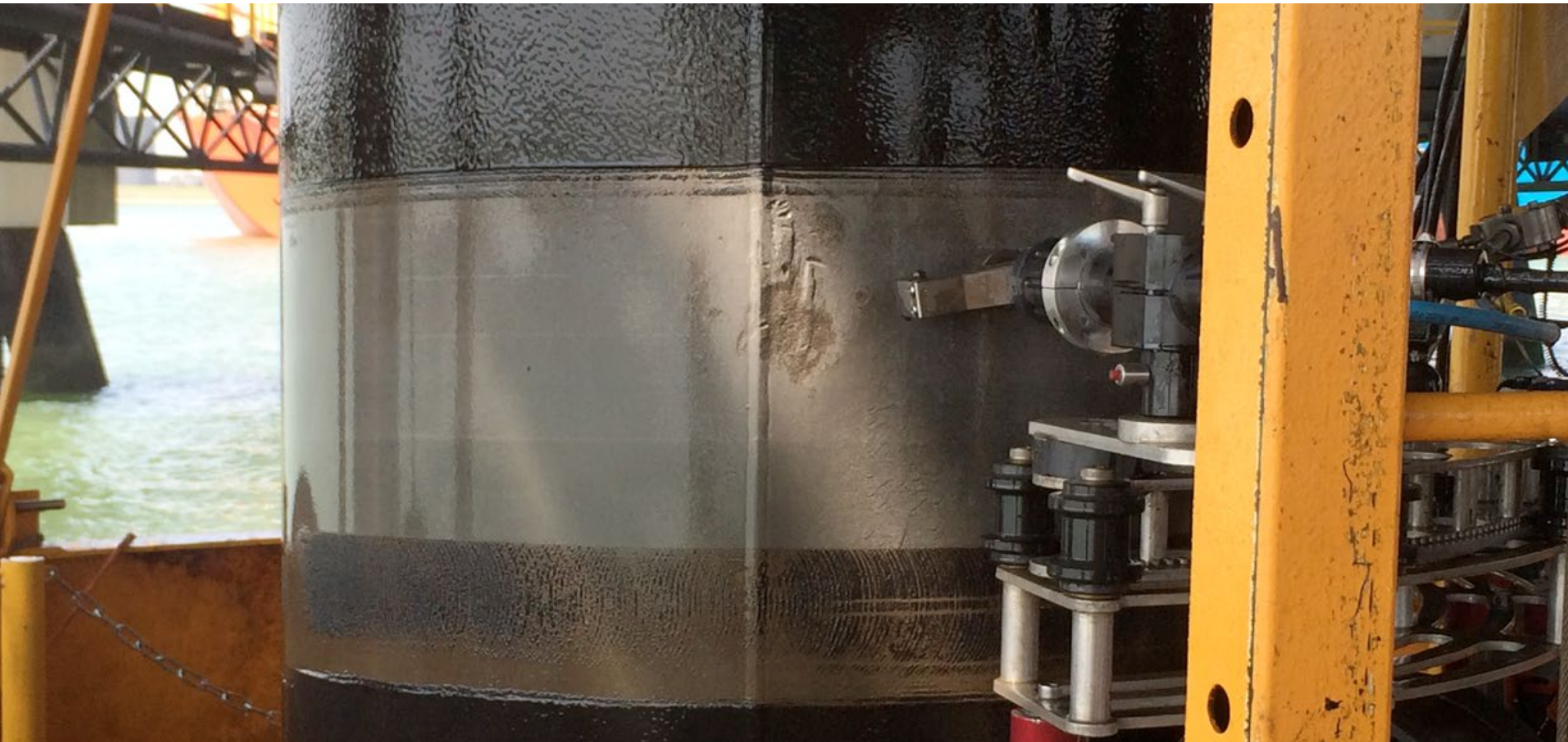
The UHP multipurpose tool is remotely controlled for operator safety, comfort and productivity. This device is also suitable for cutting hulls and pipes, above and below the waterline. Two rotating high-pressure water nozzles (from 300 bar up to 3,000 bar) are mounted on the edge of the extendable arm, which ensures that the result meets the requirements. The UHP machine adheres to the pipe by a magnetic drive assembly and can move independently, with no need for crane assistance. The UHP tool is easy to use and can even work upside down.

Tests in the field have proven that efficiency is five times higher than a hand-operated gun.

- Fast and efficient removal of heavy marine growth, weeds and paint
- One man operation suitable for horizontal and vertical surfaces
- Ergonomic design and user-friendly, wireless remote
- Suitable for underwater cleaning operations up to 5 bar
- Environmentally friendly in combination with a cofferdam operation
- Safe and secure operations
- Take out fast
- Suitable for cutting operations
- Cleaning operations are monitored by camera



# REPLACEMENT OF COATING

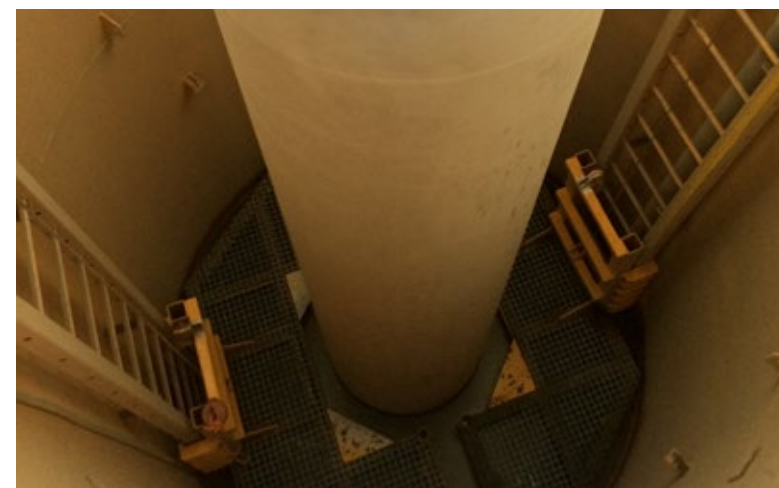


After the cleaning operation, the pile will be fully inspected for damage and other defects. By adding a ultrasonic mapping scan module the multipurpose tool inspects the pile on wall thickness. All measurements are stored digitally and projected in color and thickness. The X and Y axis are used for positioning during inspection. The result is 100% accurate.

After this inspection it becomes clear if there is any major damage and whether it can be repaired. The advantage of using this technique is time reduction and it provides optimal control, resulting in top quality work.

If there is no major damage, the new coating will be directly applied to the pile. After 6 hours the coating is 100% dry and the pile is ready to be used again.

The pile is then guaranteed for five years, which includes both the labour and product. Finally, the cofferdam is dismantled and can be installed around the next pile.



*Bottom left*  
Multipurpose tool before UHP 3,000 bar execution

*Bottom middle*  
Multipurpose tool during execution

*Bottom right*  
Pile result after UHP cleaning methods





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