

# OFFSHORE DECOMMISSIONING





# WHO WE ARE





Preparation for removal -  
scaffolding on jacket.



Boskalis is a leading global dredging and marine expert.

Since our founding in 1910, we have established a long track record of demanding projects, which have been achieved successfully through close cooperation with our clients.

In the international offshore energy sector, we offer a unique range of offshore services. Under the brands Boskalis, Dockwise, Fairmount, VBMS and Smit Lamnalco we are involved in the development, construction, transport, installation, inspection, repair & maintenance (IRM) and decommissioning of offshore and onshore facilities.

The collaboration between divisions and brands enables Boskalis to optimize our services throughout all phases of an offshore decommissioning project. Our work goes beyond the provision of services. With safety as our core value Boskalis has uncompromisingly embraced safety within its culture. This is the essence of 'NINA', our No Injuries, No Accidents safety program, which is held in high regard in the industry and by our clients. NINA rests on five values and five rules. Together they ensure that safety can be openly discussed, leading to a clear and very positive development in how safety is perceived.

Boskalis is known for its environmental expertise and commitment to the environment. Our clients benefit from our vast experience in preparing environmental impact assessments and environmental management plans. Our state-of-the-art monitoring programs and environmentally friendly techniques, working methods and equipment will enable you to fully comply with environmental regulations.



## SAFETY STATEMENT

Our people are our most valuable assets, making safety a core value. Our goal is: No Injuries No Accidents. This is embedded in our company's culture and supported through Values and Rules. All employees, including our sub-contractors, are expected to take these values and rules to heart.

### VALUES

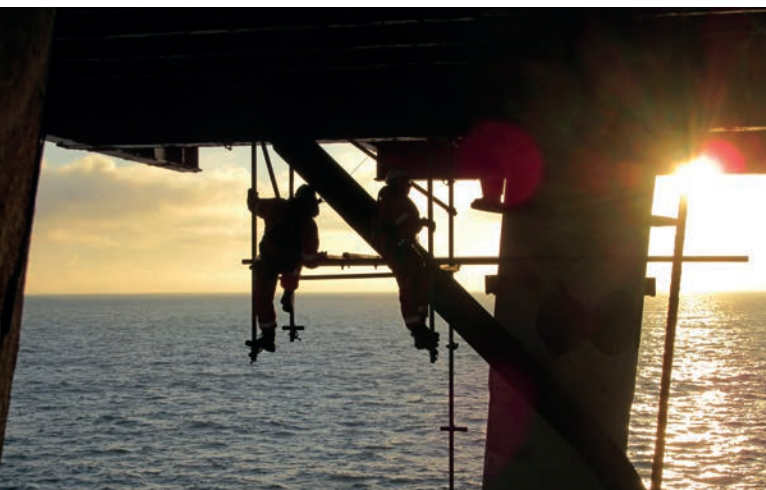
- I AM RESPONSIBLE FOR MY OWN SAFETY
- I APPROACH OTHERS ABOUT WORKING SAFELY
- I TAKE ACTION IN CASE OF UNSAFE OPERATIONS IF NECESSARY, I WILL STOP THE WORK
- I ACCEPT FEEDBACK ABOUT MY SAFETY BEHAVIOUR REGARDLESS OF RANK AND POSITION
- I REPORT ALL INCIDENTS, INCLUDING NEAR-MISSES, TO INFORM OTHERS AND BUILD ON LESSONS LEARNED

### RULES

- PREPARE A RISK ASSESSMENT FOR EACH PROJECT, VESSEL OR LOCATION
- OBTAIN A PERMIT TO WORK FOR DEFINED HIGH-RISK ACTIVITIES
- MAKE A JOB HAZARD ANALYSIS FOR HAZARDOUS NON-ROUTINE ACTIVITIES
- BE INFORMED ABOUT RISK & CONTROL MEASURES
- BE FIT FOR DUTY AND WEAR THE PPE REQUIRED



# YOUR RELIABLE PARTNER







## 'BOSKALIS HAS THE RESOURCES TO BUILD A GLOBAL TEAM AROUND THE CHALLENGES YOU FACE'

With our commitment to safety, professionalism, entrepreneurship and drive, our 11,700 experts are focused on achieving the best results for our clients.

With the acquisition of SMIT in 2010, Boskalis gained the experience, expertise and equipment of a world-renowned salvage, (wreck) removal and decommissioning company. We have continued to grow upon those foundations and developed into a company capable of offering complete solutions for Engineering, Preparation, Removal and Disposal (EPRD) contracts.

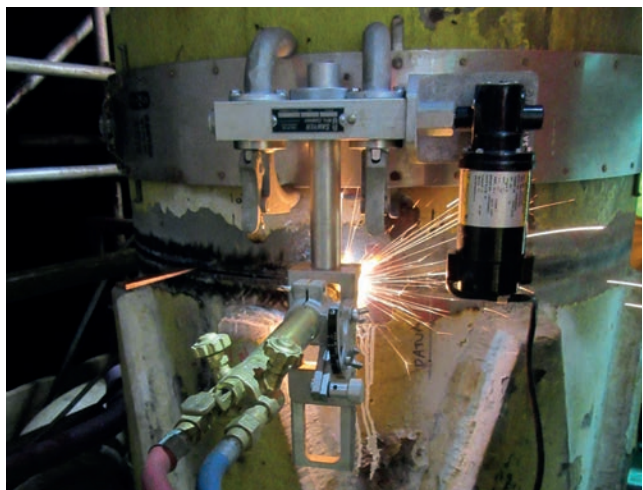
In addition to a dedicated crew, you can count on our highly skilled professionals from a wide range of disciplines. These include civil, marine, structural and transportation engineering, ecology, geology, geophysics and marine biology experts, but also surveyors, planners, designers, construction and decommissioning specialists. We can build dedicated global teams around clients and projects drawing in expertise from the breadth of the group.

As your partner you can rely on our expertise, experience and commitment to execute operations safely, on time and within budget.





# PROVEN DECOMMISSIONING SOLUTIONS



Removal by floating sheerleg.



## 'CAREFULLY CONSIDERING THE SPECIFICS OF EACH LOCATION WE DESIGN THE MOST APPROPRIATE SOLUTION'

An increasing number of offshore oil and gas facilities are nearing the end of their design life or economic operation. After years of production, wells eventually run dry and offshore facilities have to be decommissioned. Decommissioning is a complex process with many engineering and other challenges involved. Cleanly and effectively removing the offshore installations is vital to maintaining the environment around it.

Boskalis' decommissioning solutions cover the entire decommissioning process – from preparation through to dismantling, transport and onshore recycling and disposal. Through our decommissioning services we reduce the total cost of ownership and limit your environmental footprint. As an EPRD Contractor, Boskalis offers offshore (in- and out-) survey, engineering, preparatory works, cutting and removal campaigns as well as onshore handling and disposal. Our services cover the decommissioning of subsea infrastructure, including pipelines, risers, spools and wellhead frames, as well as fixed platforms (topsides and jackets) and floating infrastructure (turret buoys, mid water arches, flowlines, etc.).

The added value of Boskalis is having the expertise and the floating and subsea assets in house. The alignment between our in-house environmental and geotechnical knowledge, marine engineering capabilities, project management and procurement helps us to develop cost-effective project solutions with a focus on safety and reduction of environmental impact. These proficiencies, combined with our subcontracting and partnering abilities, enable us to streamline the whole decommissioning process.



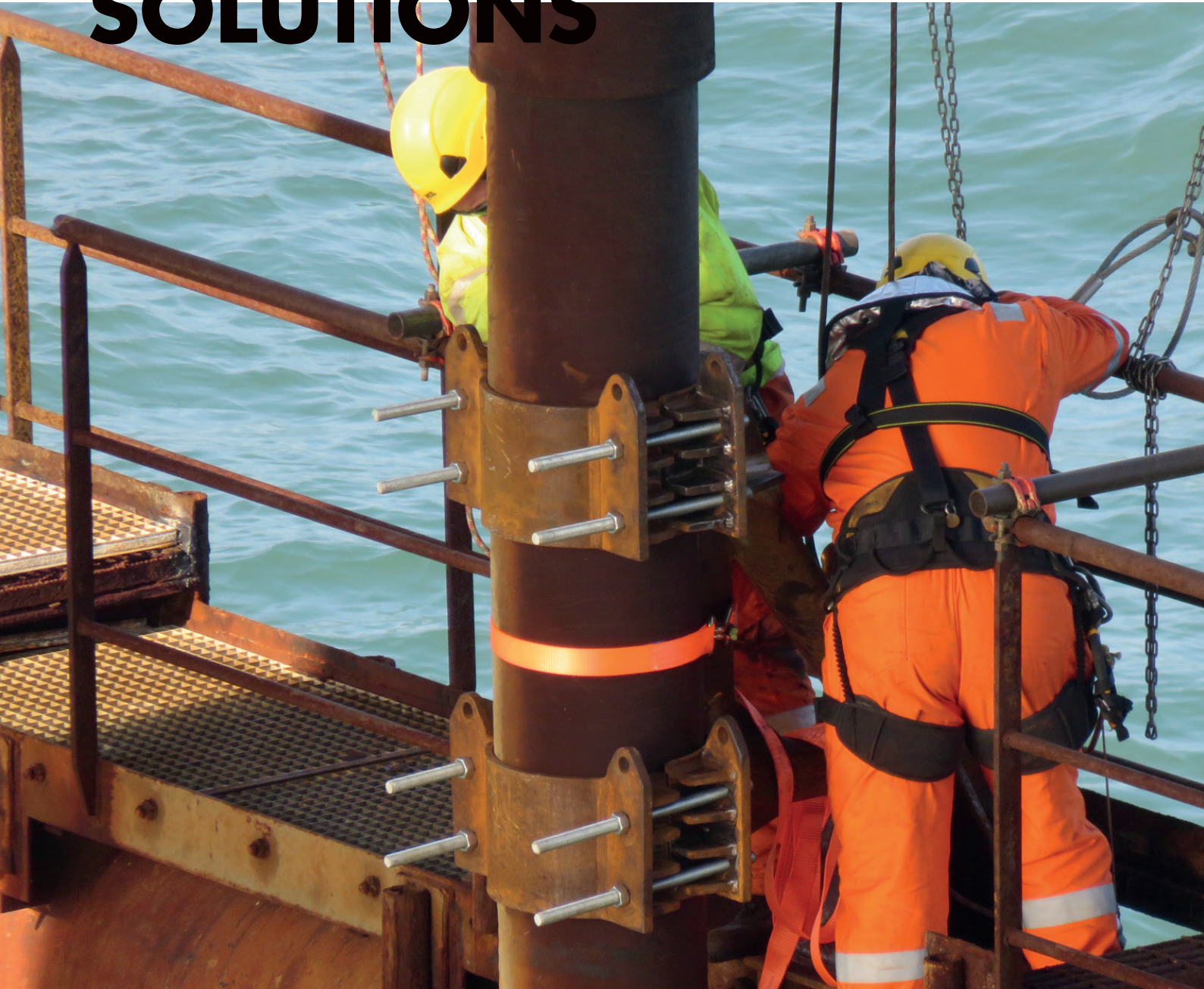
*left*  
Cutting of vent pipe.

*middle*  
Cutting legs for lift point installation.

*right*  
Sea-fastening.



# PROVEN DECOMMISSIONING SOLUTIONS





Riser clamp installation by rope access.



Our activities during the engineering and preparation phase include surveys and inspections, structural and lifting engineering, designing transportation grillage and sea-fastening, carrying out risk assessments (incl. MWS approvals), workability assessments and motion analysis, planning, and preparing detailed lifting plans and procedures.

Proper preparatory work is extremely important to guarantee safe removal operations. Moreover, it reduces offshore vessel time and hence cost. Boskalis' solutions encompass the preparatory works both above and below water. These include installation of lifting points (such as pad eyes and trunnions) and structural reinforcements, cutting, removal and/or fixation of risers, caissons and conductors, cutting of non-essential members, piping, cables, etc., subsea inspections and in-surveys, subsea cutting and removal of flowlines, spool pieces, j-tubes, umbilicals and risers, removal and recovery of concrete and frond mattresses and local dredging.

During the actual removal phase, heavy lift operations and transportation take place. The heavy lift vessel is moored and positioned and safe access to the facility is established, often by using a motion stabilized gangway system onboard the heavy lift vessel. Other services Boskalis provides during this phase include cutting of jacket extension legs, jacket airlifting for soil plug removal, internal cutting, and connecting lifting rigging and tugger lines.

After lifting, the removed section is either secured for transport by the heavy lift vessel or sea-fastened on a transport barge to be transported to a designated yard for proper dismantling and disposal.



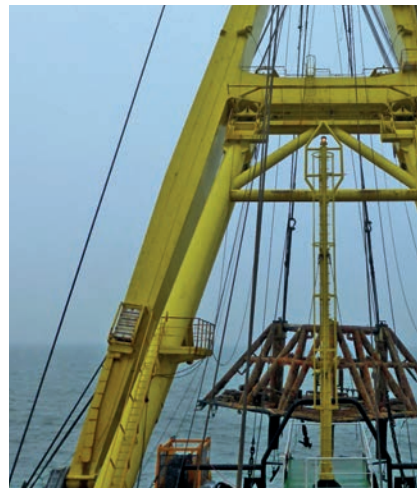
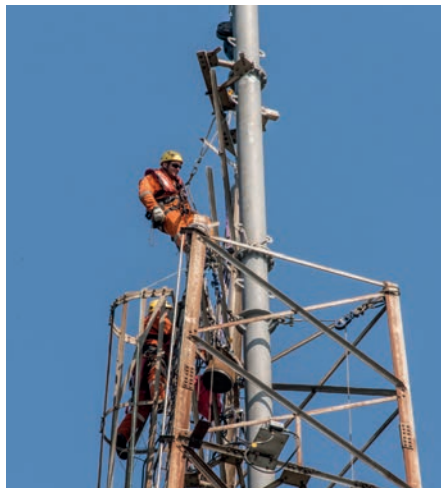
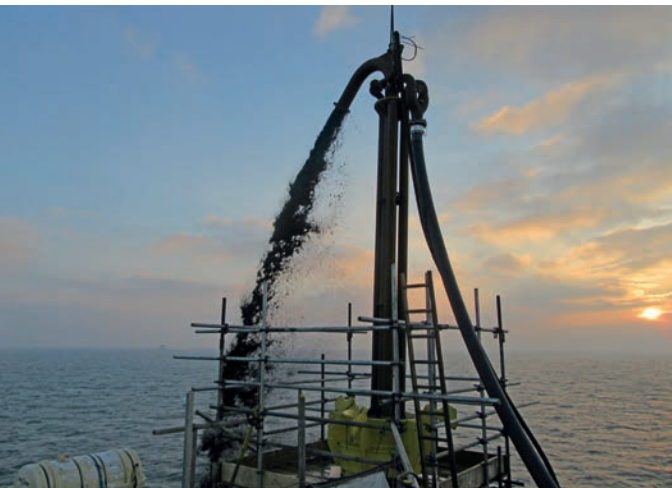
*left*  
Motion stabilized gangway system.

*middle*  
Offloading for dismantling and disposal.

*right*  
Conductor cutting and removal.



# PROJECT HIGHLIGHTS





Lifting bridge.



## 'WITH OUR SUCCESSFUL DECOMMISSIONING TRACK RECORD YOU CAN RELY ON OUR COMMITMENT TO EXECUTE EFFICIENT, SAFE AND RELIABLE OPERATIONS'

Decommissioning projects are complex and multi-disciplinary with each project having its own unique challenges and requirements. Boskalis has a successful track record in safe and efficient decommissioning of obsolete offshore facilities, including offshore survey, preparation, engineering, cutting and removal campaigns as well as onshore disposal.

Boskalis, through SMIT, already has been active in decommissioning offshore facilities since 1989 when the company removed two platforms and related sea lines for Shell Espana at the Amposta Field in Spain. Since, Boskalis has removed and disposed of a number of platforms and subsea structures, including the K10-V Satellite Platform, the P14-A platform, L13-FH subsea structure and Q8-A & B Platforms from the Dutch sector of the Southern North Sea. Offshore Denmark the company has removed a control buoy and its subsea infrastructure and in the UK sector Boskalis decommissioned the subsea infrastructure on the Camelot field, including flowlines and mattresses. Further decommissioning experience in the UK sector of the Southern North Sea includes:

### **Decommissioning of living quarters platform**

Project management, engineering, removal, transportation, and disposal of a living quarters platform, including installation of temporary removal aids, lifting gear and lifting points, creating safe access and installation of work platforms, internal cutting of piles, separating jacket and topside, removal by reverse installation method using a heavy lift vessel and transportation to shore for further dismantling.

### **Decommissioning of three bridge-linked platforms**

Preparation, removal, dismantle and disposal of the facility, consisting of three bridge-linked platforms and a subsea template. Separate piping from topsides to jackets, create access to cutting locations, separate modules, install lifting points and structural reinforcements, remove modules, topside and jackets, transport to disposal yard, dismantle the various sections and separate waste for disposal.

### **Removal of three subsea wellhead protection structures (WHPS's)**

Removal and transportation of three WHPS's, including removing grout and soil plug from the inside of the piles by a dedicated tool, severing piles using an internal cutting tool, securing pile-stubs to pile-sleeves by installing structure stoppers, recovering the WHPS's to the surface and transportation to shore by heavy lift vessel. Diverless operations in 30m water depth.

### **Decommissioning of multiple redundant offshore production platforms**

Preparation works on relatively small working areas, encompassing a variety of activities: welding of lift points, removing gas export risers, soil plug removal from jacket legs, subsea cutting and ROV inspection works. Management of simultaneous operations (SIMOPS) between Client's and Contractor's work scopes, such as hot work activities and well operations. Removal of larger platforms in multiple lifts and smaller satellites in a single lift. Transport to a designated dismantling and disposal yard.

*left*  
Soil plug removal (pile dredging).

*middle*  
Flare tower removal by piece small.

*right*  
Wellhead protection structure removal.



# EQUIPMENT





Platform removal by floating sheerleg.

Boskalis operates one of the largest fleets of specialized offshore vessels in the world, including heavy lift vessels, diving support vessels, heavy transport vessels, (anchor handling) tugs and barges. Our fleet of lifting equipment comprises a number of floating sheerlegs, including those owned and managed in the Joint Venture Asian Lift Pte. Ltd.

By the conversion of our semi-submersible heavy transport vessel the MV Finesse, our fleet will be expanded with a 3,000t capacity crane vessel. With a deck space of 7,000 m<sup>2</sup>, this vessel will be able to load multiple structures, resulting in fewer transits to the disposal yard. Its DP-2 capabilities prevent loss time for anchor spread deployment. The vessel will be able to work in harsh environments, can accommodate 150 persons and will have a helicopter deck for offshore transfers.

In addition, the company owns equipment such as dredgers and grabbers for excavation and seabed rectification services, and has the experience to procure and operate third party equipment, for instance cutting tools, for decommissioning works.

Our versatile fleet is supported by the full spectrum of in-house design, SHE-Q, procurement, project management and engineering expertise, including a specialism - workability studies to assess vessel behavior under different environmental conditions (e.g. wind and wave effects, which impact the load and stability of the vessel) with different loads.

DP-2 3,000t capacity crane vessel.





# LET'S TALK







## 'TELL US ABOUT YOUR CHALLENGES'

For over 100 years, Boskalis has helped clients meet some of the toughest challenges.

### **How can we help you?**

Give us a call and tell us about your challenges.

Or look at our portfolio on [www.boskalis.com/offshore](http://www.boskalis.com/offshore). You can download our corporate brochure and our solutions brochures.





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