

MARIN – FER week

Use of Simulator in preparation for Offshore Operations

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Wageningen, The Netherlands

18 June 2025

MARIN – FER week

Use of Simulator in preparation for Offshore Operations



1 Safety Statement

2 Boskalis Offshore Energy Introduction

3 No Incidents No Accidents – Indicated risks

- External forces on DP system**
 - Manning the system**
-


4 Recommendations and General Observations


Boskalis Introduction – Company Overview




11.000
Employees


90
Countries

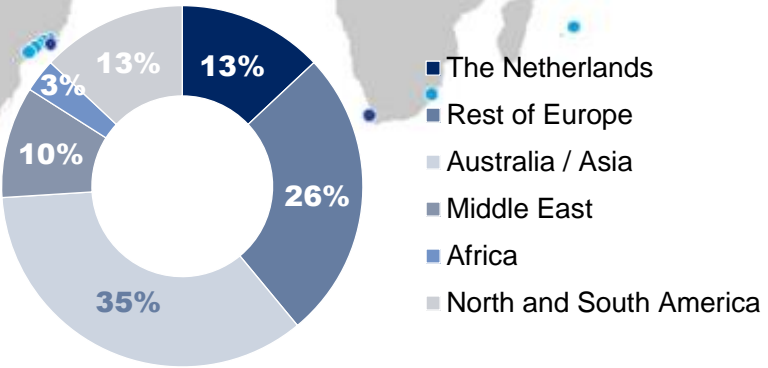
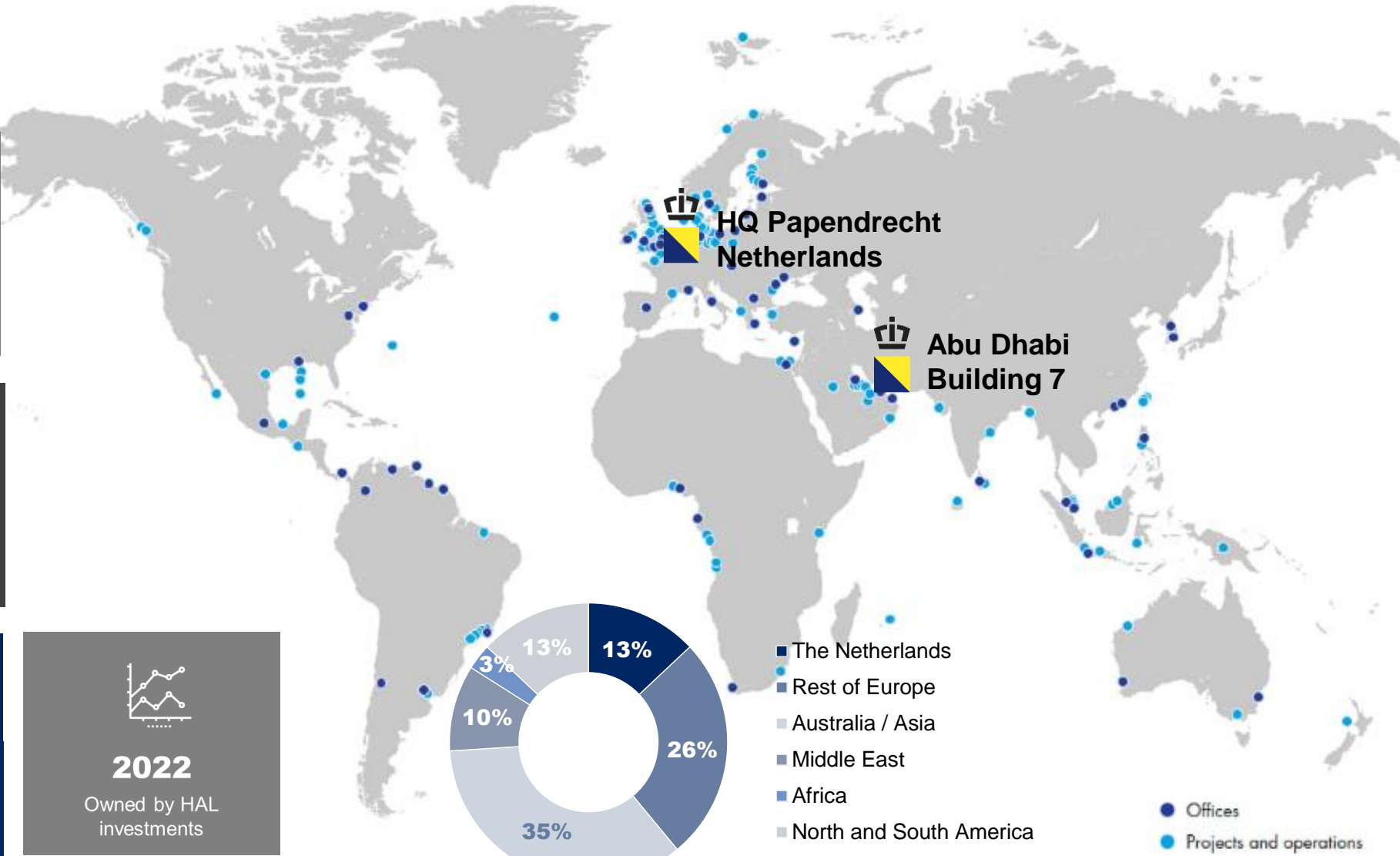

700
Vessels


EUR 4.28bIn
revenue 2023


100+
Years track record


EUR 6bIn
Order Book 2023


2022
Owned by HAL
investments



Revenue by region (2023)

Safety Statement



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



No Indicents – No Accidents



Maritime News > Accidents > Wind turbine blades and parts...

Wind turbine blades and parts collapsed into water VIDEO

Posted in **Accidents** by Mikhail Voytenko on Oct 23, 2021 at 16:55.

salvage_and_wreck reports: MPI Offshore, an offshore installation service firm owned by Van Oord, last week (18-10-2021) accidentally dropped three wind turbine blades into the sea, while conducting scheduled maintenance at Vattenfall's Ormonde wind farm in the Irish Sea, off the UK.

According to the incident report, MPI Offshore's **MPI ADVENTURE** jack-up vessel last week jacked up alongside Ormonde B01 wind turbine and dropped three 61 m turbine blades and a blade clamping tool weighing 3000-3100kg overboard.
https://www.instagram.com/salvage_and_wreck/



New FleetMon Vessel Safety Risk Reports Available:
<https://www.fleetmon.com/services/vessel-risk-rating/>



Larsen & Toubro confirms heavy-lift vessel incident

Company starts investigation following crane boom collapse on LTS-3000 vessel that injured two people

18 March 2022 0:20 GMT
By **Newsroom** Updated: 18 March 2022 8:08 GMT

Indian engineering giant Larsen & Toubro (L&T) has confirmed an incident on a heavy-lift vessel earlier this month that was working on the Cluster-8 development project off India's western coast.

Upstream reported last week the crane boom of the heavy-lift pipelay vessel LTS-3000 collapsed on 8 March and injured two people, with an offshore jacket plunging into the sea.

L&T Hydrocarbon Engineering (LTHE), the hydrocarbon subsidiary of L&T confirmed the development to Upstream, without naming the offshore vessel.



Wind turbine installation vessel capsizes in Southern China (VIDEO)

Monday, July 26 2021

WIND ENERGY – CHINA ACCIDENT

Wind turbine installation vessel Sheng Ping 001, formerly Teras Fortress 2, capsized off the coast of South China's Guangdong on Sunday morning local time.



Chinese local media said that there were 67 people on board.

The accident took place at around 11,00 hrs local time, near the Honghaiwan wind measurement tower in the Red Bay area of Huizhou.

NEWS

05.07.2022

2,000t offshore crane sinks

22 people are thought to have perished after an offshore wind turbine installation vessel broke up and sank in waters 190 miles south of Hong Kong.

The vessel - the 204 metre by 42 metre wide Fu Jing 001 - operated by Shanghai Huajing Zhiyun, was equipped with a 2,000 tonne rotating crane and was working on the installation of two offshore wind farms for Qingzhou Offshore Wind when Typhoon Chaba hit the South China seas on Saturday.



The final moments of the Fu Jing-001 photo courtesy Hong Kong Government Flying Service

The vessel moved to a more sheltered anchorage but was still close to the storm and slipped its anchor sometime over the weekend and was caught up in 145kph/90mph winds and 10 metre waves, causing it to break in two, with the front of the vessel, complete with the crane, sinking fairly quickly.



Boskalis in Offshore Energy



BUSINESS LINES OFFSHORE ENERGY



HEAVY MARINE TRANSPORT

- Production facility transportation
- Drilling rig transportation
- Module transportation for onshore facilities
- Transportation of offshore wind farm components
- Float-over installation



MARINE SERVICES

- Anchor handling
- Ocean towage
- Positioning services
- Floating facility installation



SEABED INTERVENTION

- Subsea rock installation
- Landfall construction
- Terminal development
- Gravity based structure installation



SUBSEA SERVICES

- IRM services
- ROV/diving and light construction work
- SURF installation



OFFSHORE HEAVY LIFTING

- Wind turbine foundation installation
- Substation installation
- Oil & gas facility installation
- Oil & gas facility decommissioning



SUBSEA CABLES

- Subsea power cable installation
- Cable burial and protection solutions
- Electrical terminations, testing & jointing
- Cable repairs



SURVEY

- Marine Geotechnical Surveys
- Marine Geophysical Surveys
- Marine Environmental Surveys
- UXO survey



Boskalis – Offshore Heavy Lift

- Main business: Offshore Wind, T&I contracts (Monopiles, Transition pieces, Jackets, Offshore substations)



- Oil & Gas transport, Installation and Decommissioning (Jackets, Topsides & Subsea Structures)



Bokalift 1

- Length: 216m
- Breadth: 43m
- Draft: 8-9m
- Air draft: $\pm 85\text{m}$
- Deck: 7000m^2
- Max POB: 150 persons
- Max lift capacity: 3000mt



Bokalift 2

- Length: 231m
- Breadth: 49m
- Draft: 9m
- Air draft: $\pm 100\text{m}$
- Deck: 7500m²
- Max POB: 150 persons
- Max lift capacity: 4000mt
- Outfitted with:
 - Motion Compensated Pile Gripper Frame with Integrated Single ring Noise Mitigation System
12.5m OD / 3000mt / 125m MP length
 - MP Upending Hinge:
3000mt / 12.5m OD / 125m MP length





No Incidents No Accidents



Indicated risks

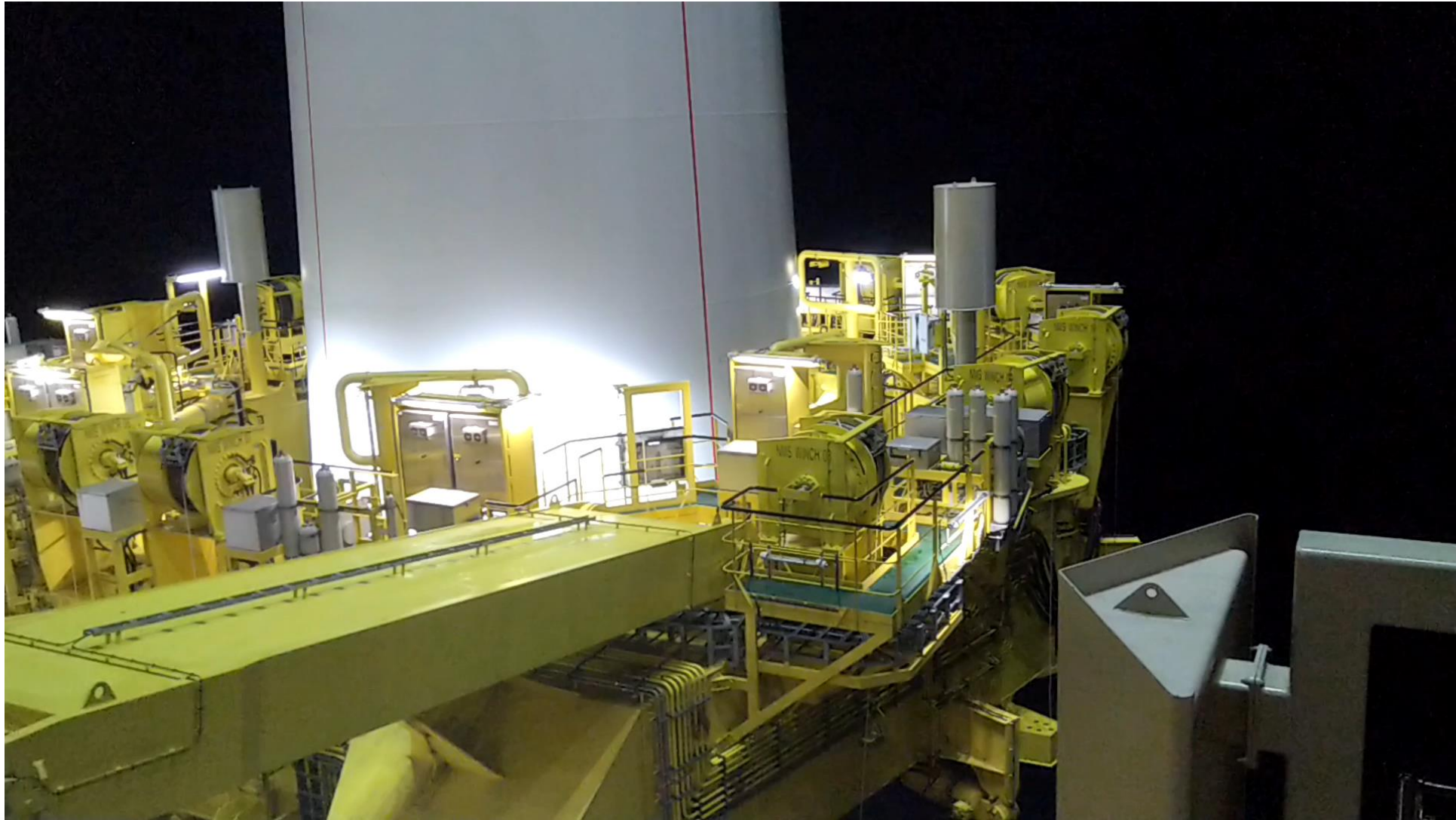
- Logistics
- Repetitive steps on board
- Communication on board
- System controls (DP vs MC-PGF)

When human in the loop

- Training ahead of task
- Simulator system identical to actual vessel systems



External Forces on DP-system



Manning the system

**Crane
Operation**

**Dynamic
Positioning**

**Anti Heeling
System**

**Motion Compensated
Pile Gripper Frame**



Recommendations – General Observations

- Design
 - Novel system : no pre-paved routes
- DP
 - Complexity of DP-system
 - Multiple DP inputs
- Certification
 - Certification for components,
 - Not for system / system limits
- User
 - Established requirements for 'base-case'
Like: (S)DPO training, Crane driver (stage 3)
 - No requirements for peripheral equipment operators
(including gripper)



Recommendations

- Design of DP combined with MC-PGF
 - 3rd party verification of process and system
 - Vessel component functionality
 - Calculation methodology of system operating limits
 - Up to & including Site Integration and Testing



- People:
 - Engineering stage: Allowance required for learning how-to
 - Involvement of contributing parties
 - Involvement of end-users (of the new system)
 - Training to learn, improve and refresh (minimum 1/ year)



THANK YOU FOR YOUR ATTENTION