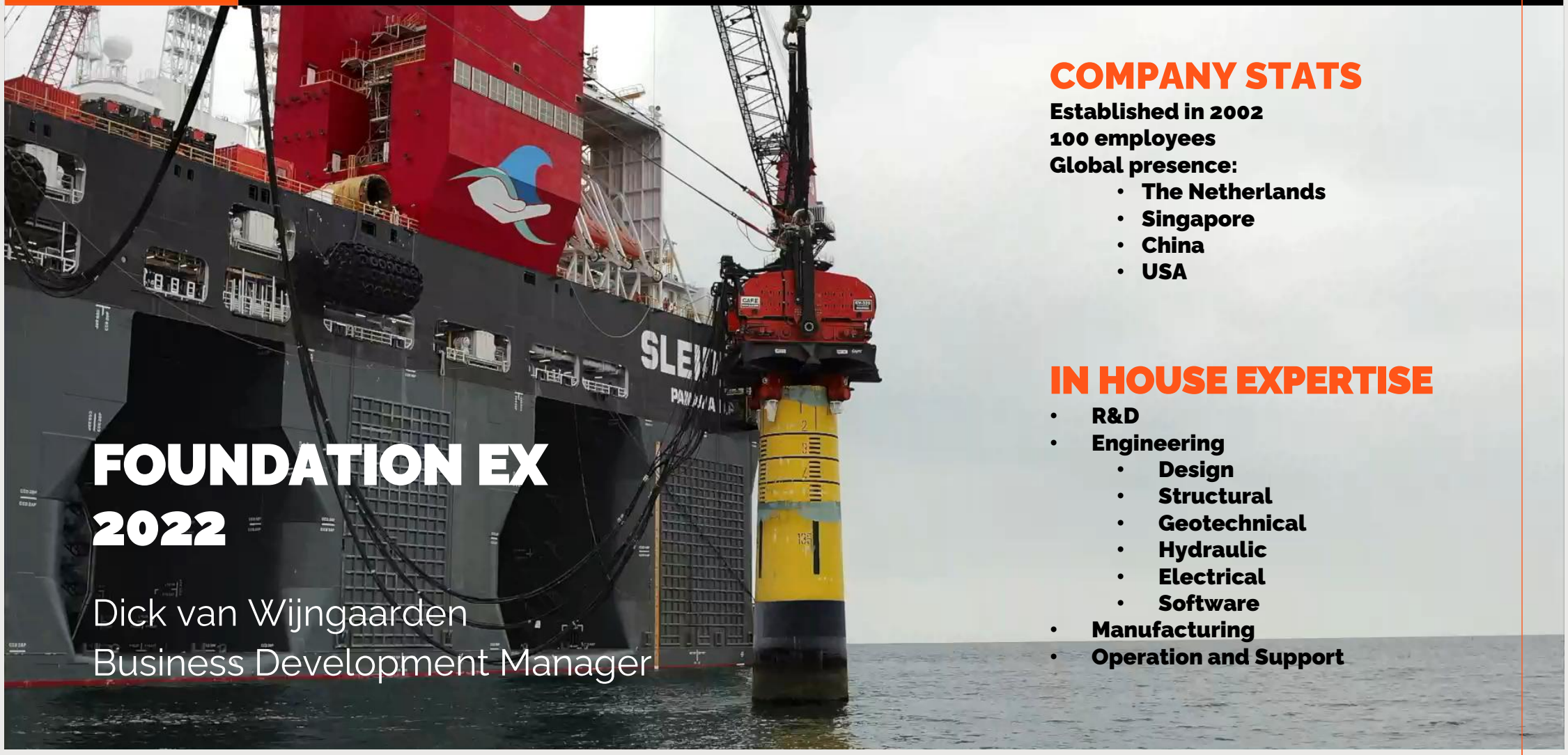
CAPE HOLLAND

DRIVEN BY PILES



FOUNDATION EX 2022

Dick van Wijngaarden
Business Development Manager

COMPANY STATS

Established in 2002
100 employees
Global presence:

- **The Netherlands**
- **Singapore**
- **China**
- **USA**

IN HOUSE EXPERTISE

- **R&D**
- **Engineering**
  - **Design**
  - **Structural**
  - **Geotechnical**
  - **Hydraulic**
  - **Electrical**
  - **Software**
- **Manufacturing**
- **Operation and Support**

WIDE RANGE OF PILE TYPES AND DIMENSIONS

GROUTED CONNECTIONS

FLANGE CONNECTIONS

SLIP JOINT CONNECTIONS

C1 CONNECTIONS

CAPE VLT-80

CAPE VLT-160

CAPE VLT-320

CAPE VLT-640

TANDEM CONFIGURATION

TRIPLE CONFIGURATION

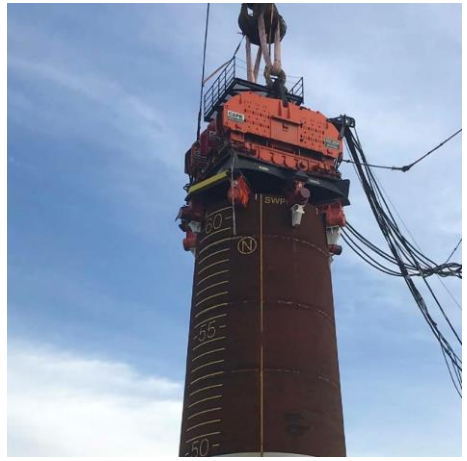
QUAD CONFIGURATION

For pile diameters as little as 20"

For pile diameters of 8m+ with weights of 3,000t+

CAPE VLT EXPERIENCES

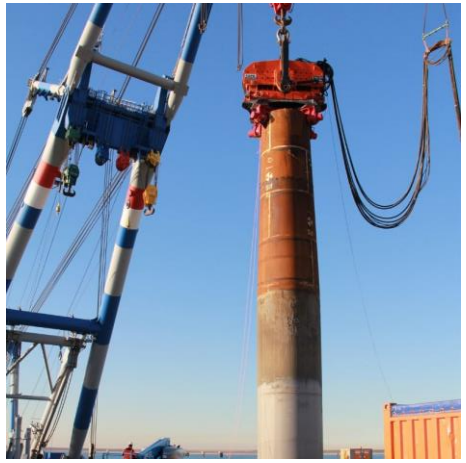
OVER THE LAST DECADES, THE CAPE VLT HAS BUILD UP AN EXTENSIVE TRACK RECORD



MONOPILE INSTALLATION

PIN/JACKET PILE INSTALLATION

ANCHOR PILE INSTALLATION



DECOMMISSIONING

CAPE HOLLAND

DRIVEN BY PILES

REDEFINING THE FUTURE OF XXL MONOPILE INSTALLATION

FOUNDATION EQUIPMENT

Offshore Foundation Solutions
Vibratory Hammers

10 May 2022

Introduction

- THIS IS DIESEKO GROUP

- Dieseko is the global player in the foundation technology market based in the Netherlands
- World leader in vibratory equipment
- Almost 50 years of history
- 200 employees worldwide
- Part of SHV

DIESEKO GROUP

Netherlands | USA | Poland | China | Australia

Global Dealer network of 40 dealers

Dieseko Offshore Solutions

De-commissioning

Jacket + Pinpiles

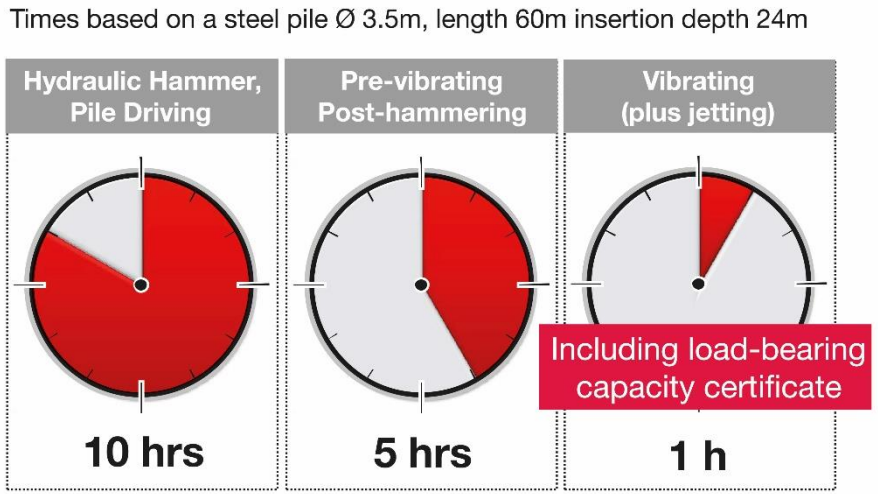
MonoPiles

Anchoring Solutions

Vibratory Hammers vs. Conventional Methods

1. Installation Speed Significant time saving
   - Efficiency, more piles installation in shorter time-frame
2. Noise reduction
3. Accurate positioning
   - Option to extract piles
4. Mitigate risk of Pilerun
5. XXL MP Diameters
6. Less pile fatigue
7. Installation w/o use of Gripper-frame
8. Robustness, easier on-board maintenance

1



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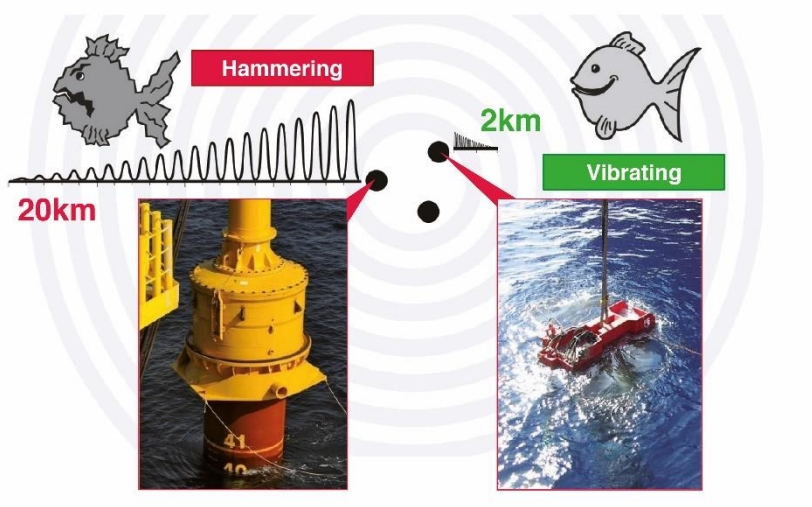

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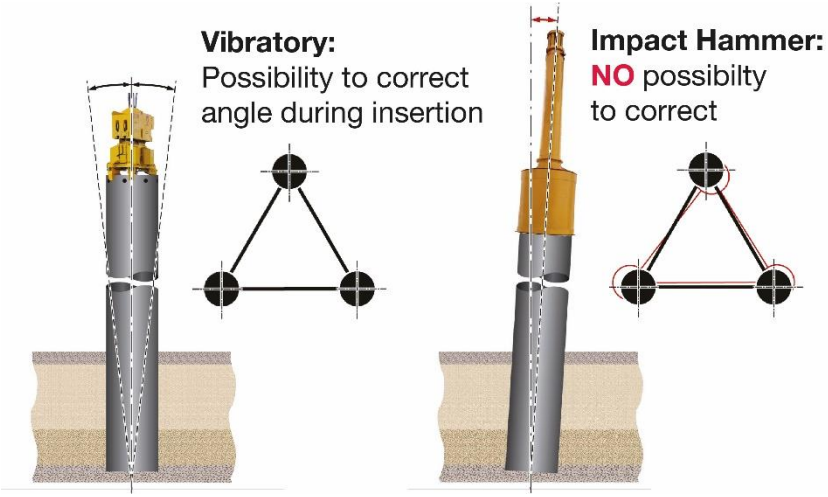



•Thank you

Allnamics consultants for Geotechnics & Pile Testing

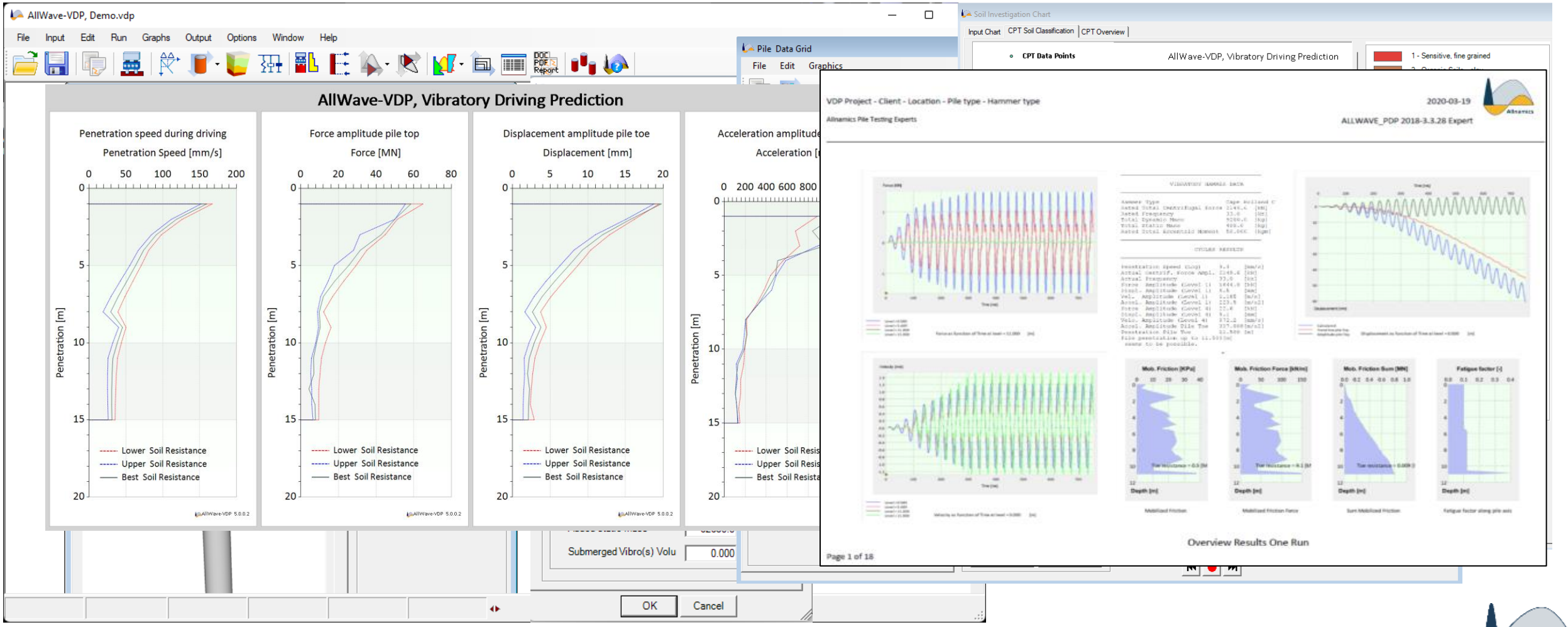
Allnamics

- Geo-Engineering
- Pile Testing Services
- Equipment Development & Sales
- Research & Innovation
- Reuse Foundations & Sustainability

Allnamics Academy

Allnamics

AllWave-VDP: Allnamics in house developed software for vibro driveability studies since 1980's



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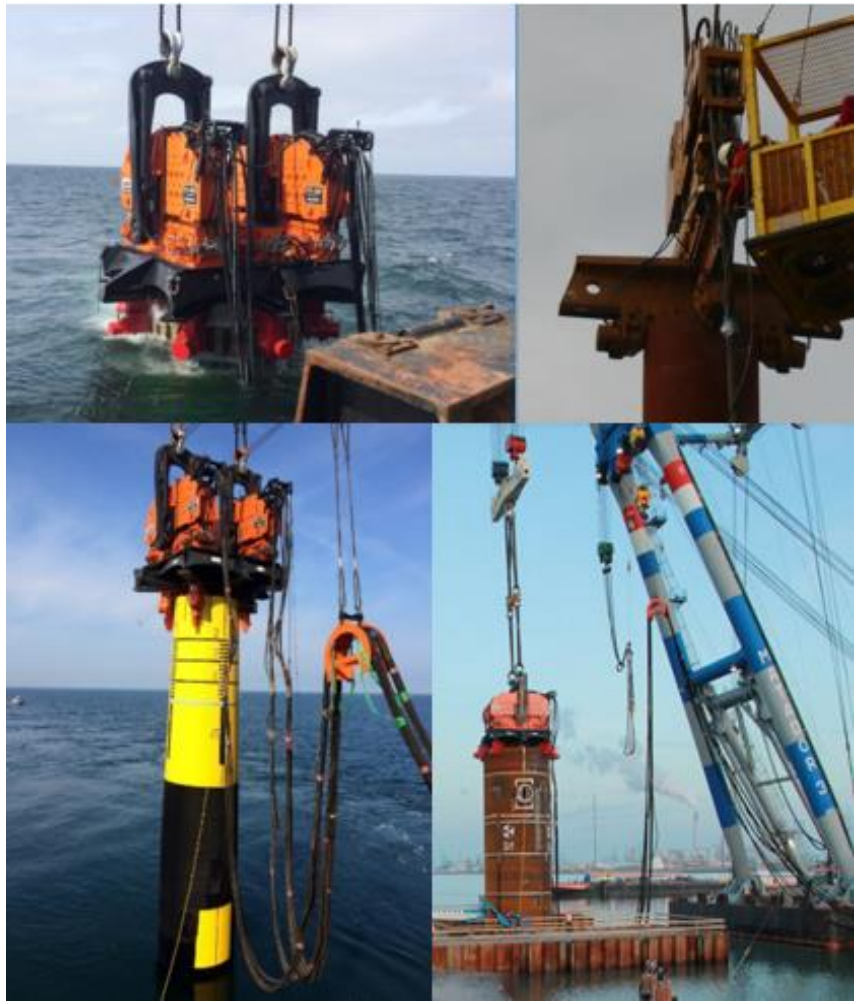
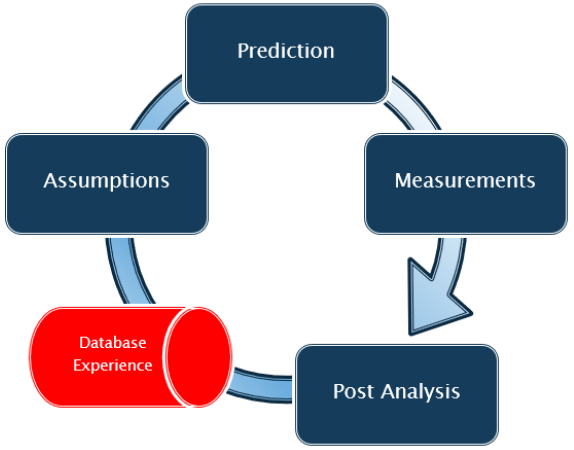
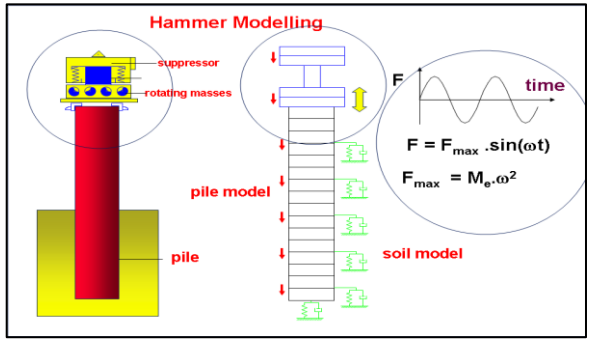
Allnamics main offhsore vibratory driving projects

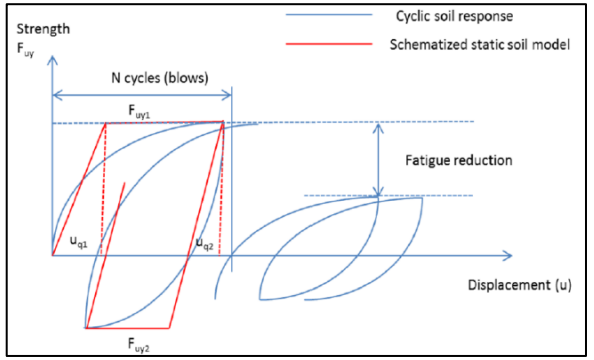


AllWave-VDP: Learning loop

- Vibratory driving simulations provide consistently realistic results
  - based on stress wave propagation solved by the Method of Characteristics
- Refusal depth can be properly predicted
  - if the monitored frequency is input in the AllWave vibratory driving prediction software
- Prediction of actual vibro frequency depends on soil conditions and performance of hammer and power pack is not (yet) possible.
  - This is tackled by considering multiple frequency scenarios.
- Soil caps can be used for certain soil conditions
  - Namely dense offshore North Sea sands.
- Vibrodriving has been proven in non saturated sands and clays soil types.
- Soil resistance recovery is similar to impact driving.
- An rough estimate of a vibrodriven pile capacity is possible through the application of the Vibratory Amplitude Matching, VAM. It is however still not fully finalized.







Allnamics

Future trends for vibratory driving from a vibro driveability studies point of view

1. Based on the experience gained in many back analysis of monitored projects both offshore and onshore as defined by the learning loop, a **consistent realistic assessment and feasibility of vibro driving** can be performed
2. As for impact driving, monitored vibratory driving projects or scaled tests are still the best representation of the local soil conditions. **Hook loads and other variables are essential to be monitored** in order to have **useable input** for a next iteration of the learning loop.
3. Currently design methods and norms for pile driving are overwhelmingly aimed at impact driving. It is expected that with increasing monitored projects, **norms and codes will evolve integrating vibrodriving with an adapted set of rules**, optimizing pile design without sacrificing pile capacity.
4. In the near future to see more estimates of vibratory driving pile capacity perhaps linked to static load tests or dynamic load tests.

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