Digitalisation – Klyngesamling Rosendal

14 June 2018

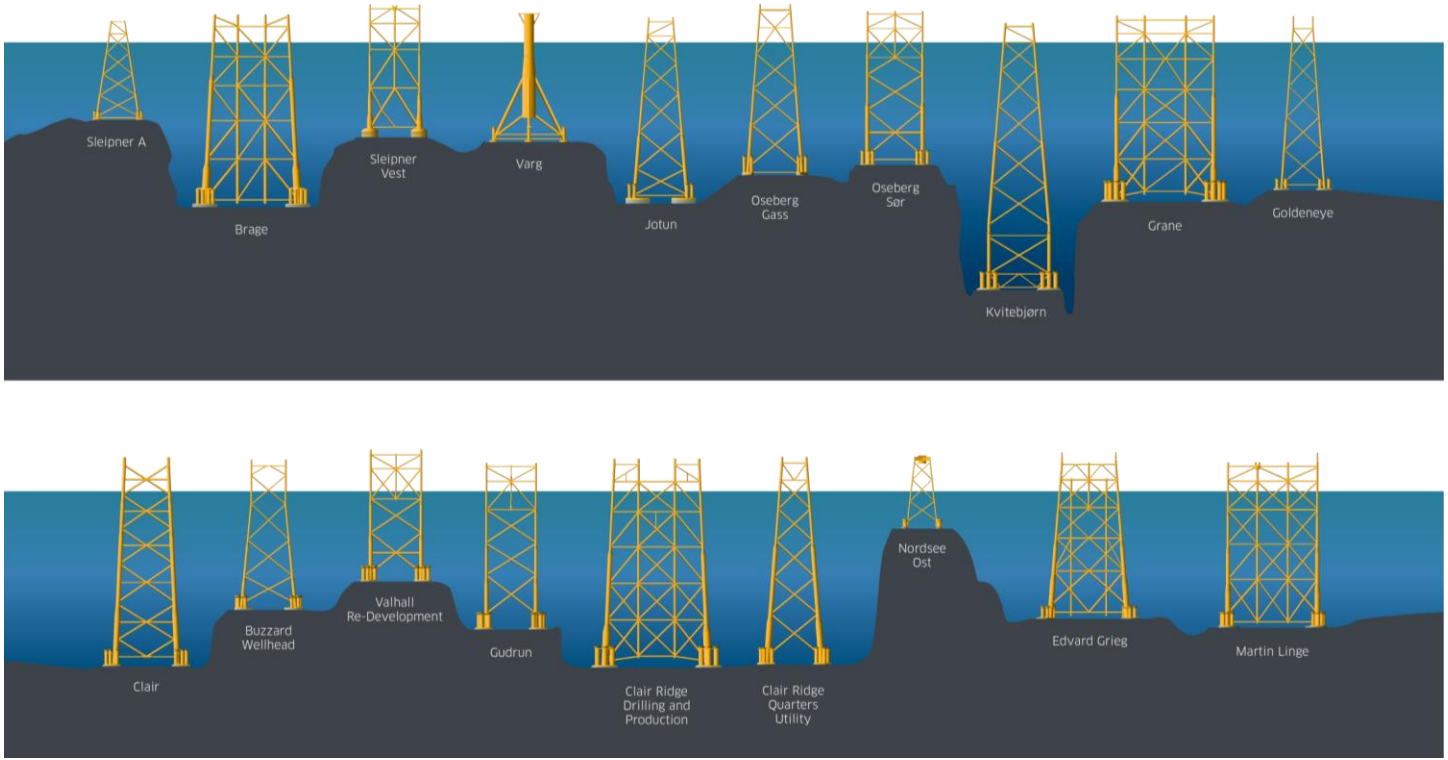
KVÆRNER™

A Jacket is a steel substructure...

…used in a range of offshore structures

The Jackets yard at Verdal

Designs vary, but have patterns



How to design and build a Jacket

Input

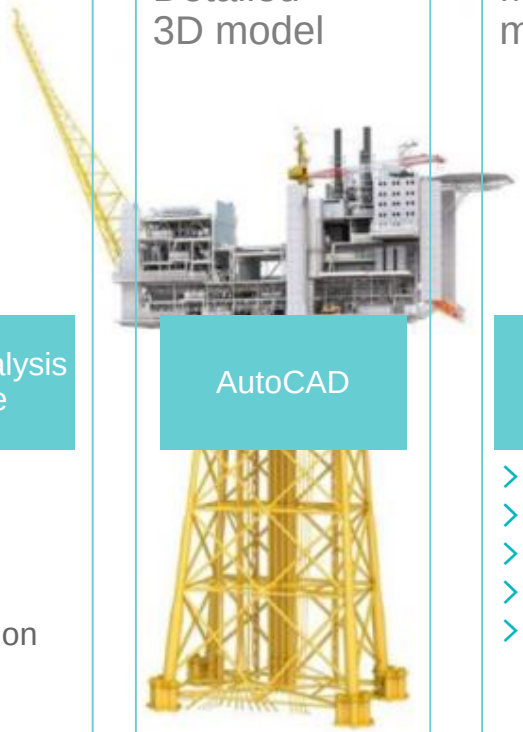
- Water depth
- Soil conditions
- Wave model
- Topsides weight & CG envelope
- Topsides interface
- Seabed interface
- Standards & regulations

Analysis

3rd party analysis software

- In-place
- Fatigue
- Transport
- Launch
- Ship collision

Detailed 3D model



AutoCAD

Method and materials

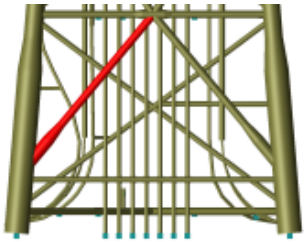
MIPS Custom application

- Materials
- Logistics
- Work packages
- Completion
- Commissioning

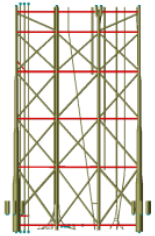
Output

- Analyses results
- Reports & docs
- Detailed 3D model
- CNC files
- Material lists
- Work packages
- Build method

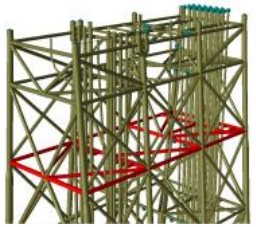
Jacket design topics



Brace placement



Elevation location



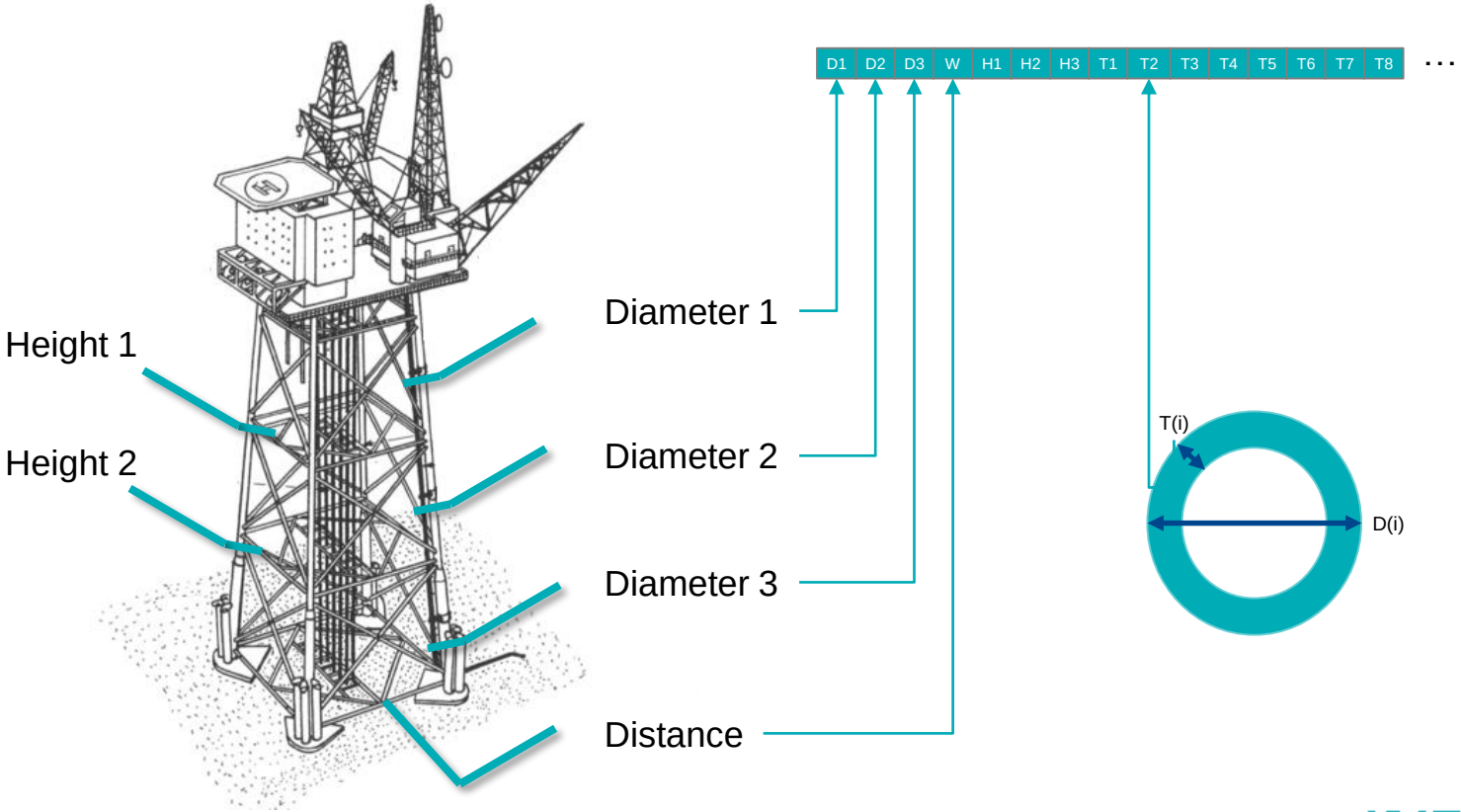
Elevation brace pattern

Joint optimalisation

Row bracing patterns

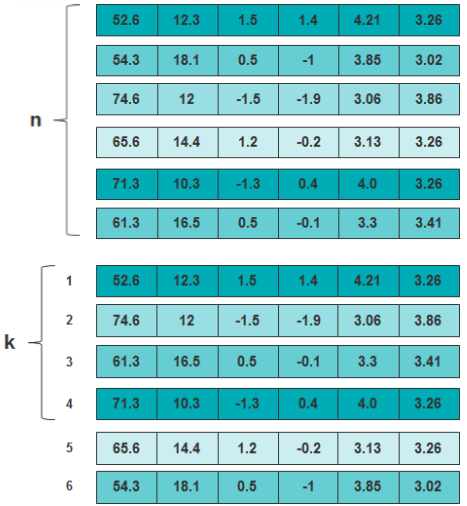
Global optimalisation

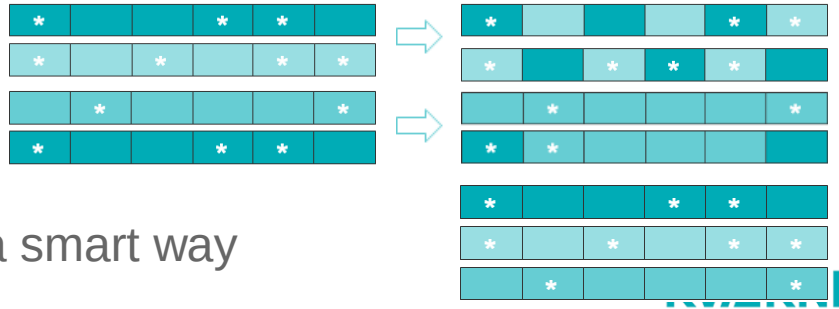
Model the problem



Run and tune a suitable algorithm

- Establish the initial population
- Run analysis and evaluate results
- Rank the results and select winners
- Breed the next generation
- Adjust the parameters in a smart way





The claim

Use Algorithms and Massive Computing Power to

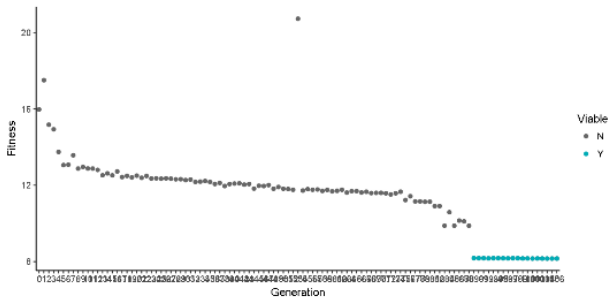
Generate, Analyse and Rank various Designs, to

arrive at a Viable Solution quickly,
Optimised for Weight and/or Cost and/or Build time

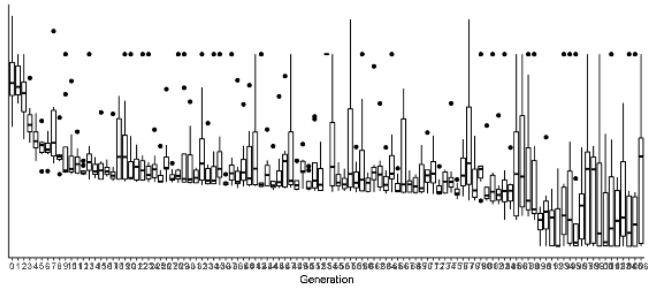
Does it work?

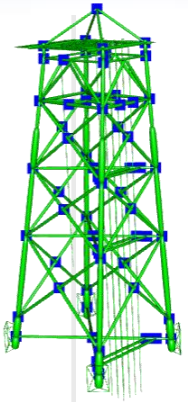
L-Alpha
PERFORMANCE

Most fit member over the generations
Showing generation: 0 to106



Distribution of members in generation by fitness
Showing generation: 0 to106





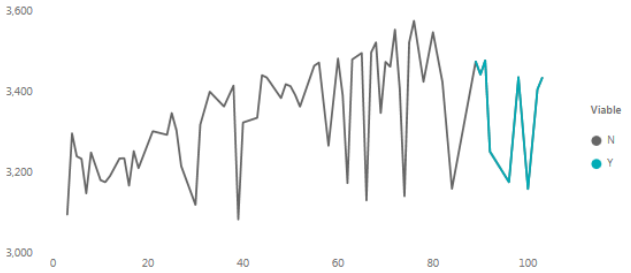
Select analysis

- ☐ Inplace
- ☐ Inplace + Fatigue

Median run time per generation
in minutes

00:02:33

Minimum weight per generation
Showing generation: 0 to106



Select generations

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