MARITIME

Practical experiences and guidelines on how to use DNV GL DP Capability standard ST-0111

MTS DP Conference 2018

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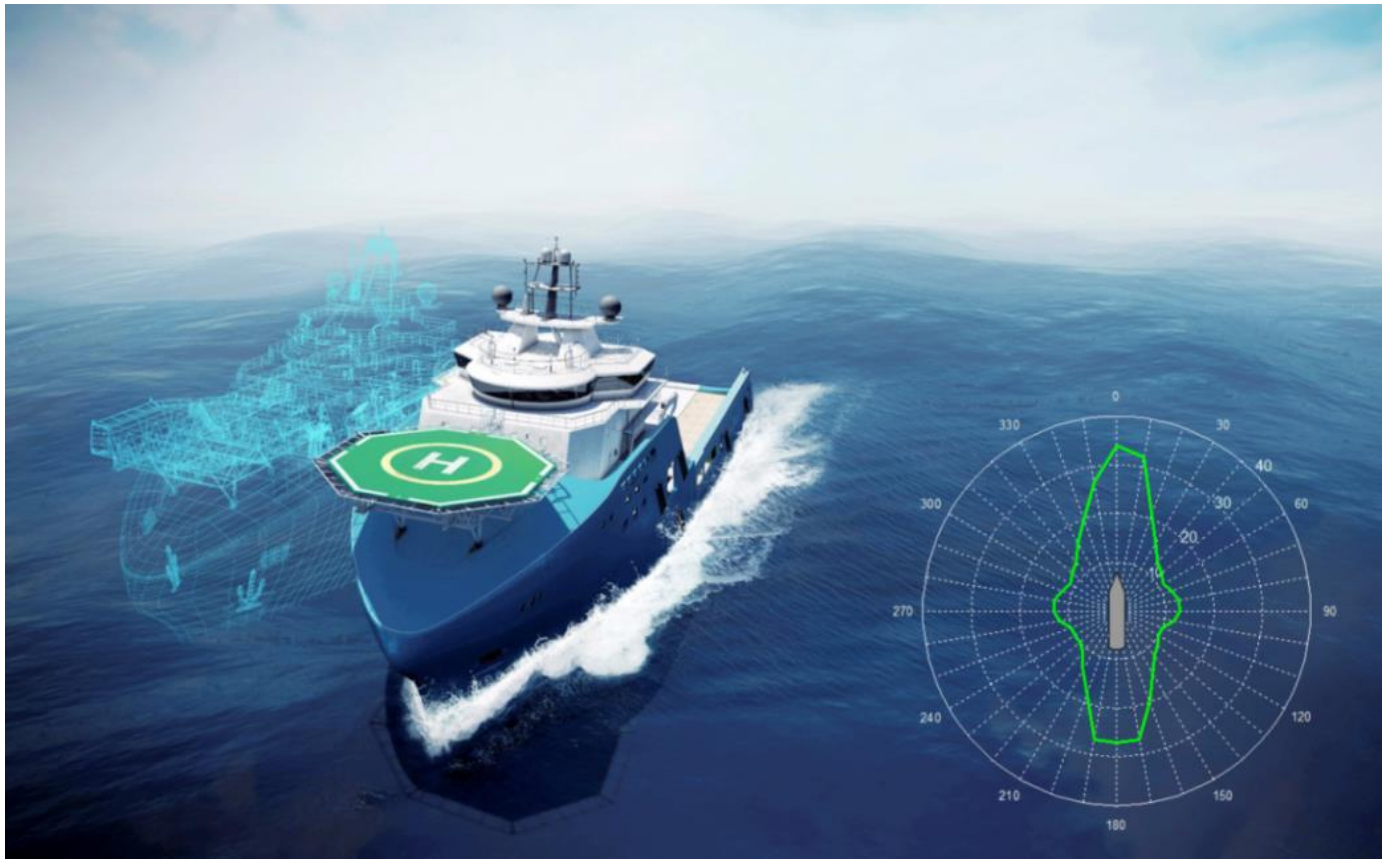
Agenda

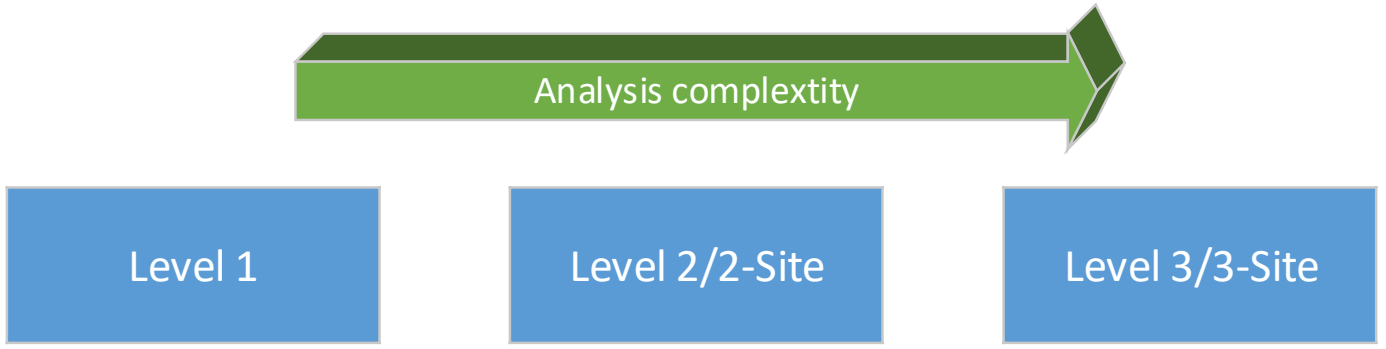
1. Recap on DNVGL-ST-0111 levels
2. Feedback from industry and experience from practical use
3. Comparison between different levels
4. How to apply the standard and example of specifications
5. Updates in the next revision
6. Updates in the web-tool



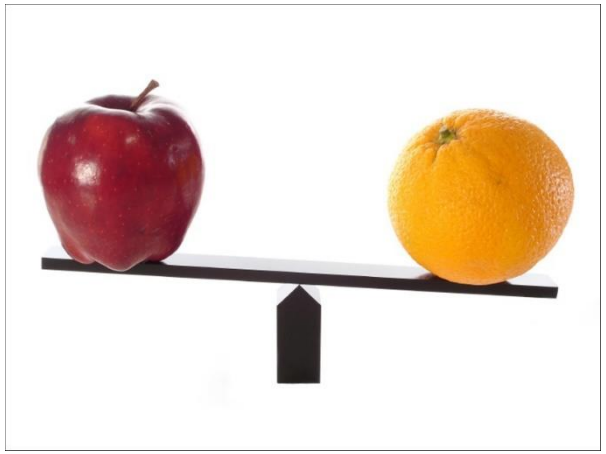
Three main DP Capability levels, plus site-specific calculations

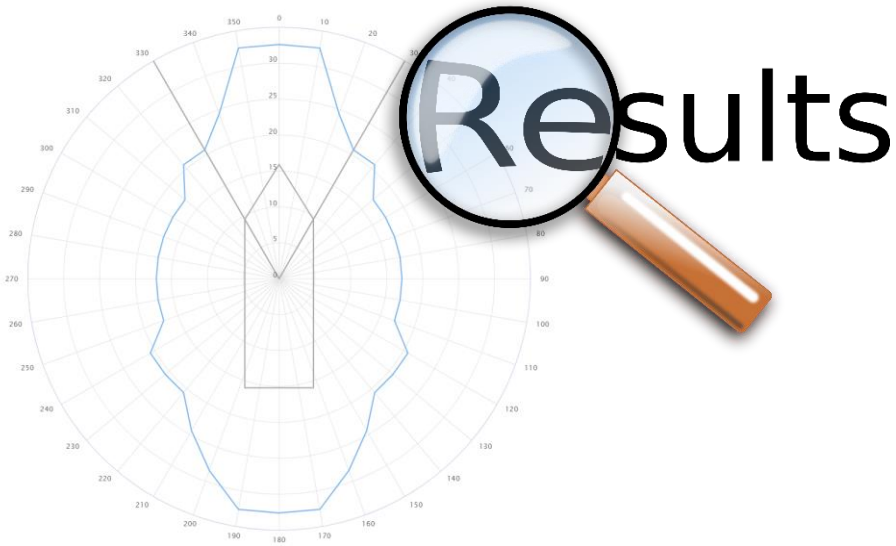
DP Capability level	Level description
1	• **Prescriptive method** for documenting **ship-shaped mono-hull**. • Based on a **static balance** of environmental forces and thrust output. • **Beaufort scale** based environmental conditions shall be used. • Facilitate **vessel comparisons**
2	• More comprehensive quasi static method. • **Allows for project specific adjustments** to the calculations • Applicable for all vessel shapes. • **Beaufort scale** based environmental conditions shall be used.
2-Site	• Same as Level 2 • Allows for **site specific environmental data** and external forces.
3	• **Get more insight on the vessel DP capability performance** by use of time domain simulations • Includes the relevant **vessel and environmental dynamics** • Can provide more information of the station-keeping performance than the other DPCAP Levels
3-Site	• Same as Level 3 • Allows for **site specific environmental data** and external forces.

Feedback from industry – experience from practical use



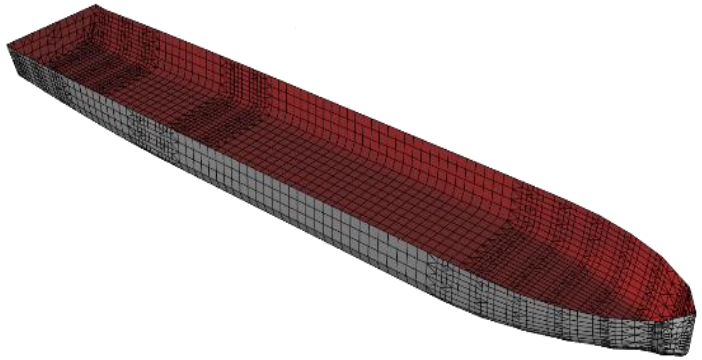
Feedback from industry

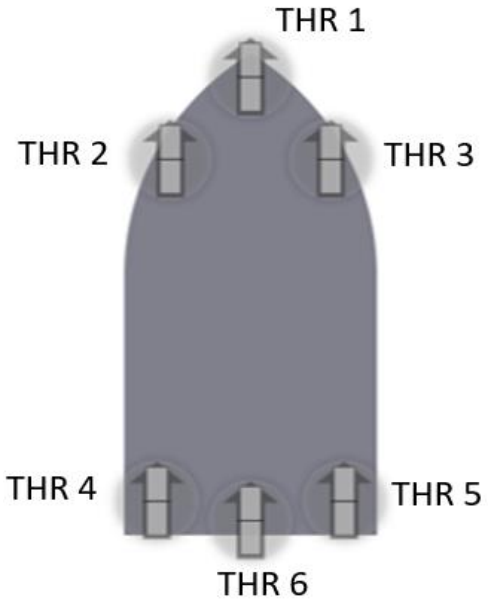


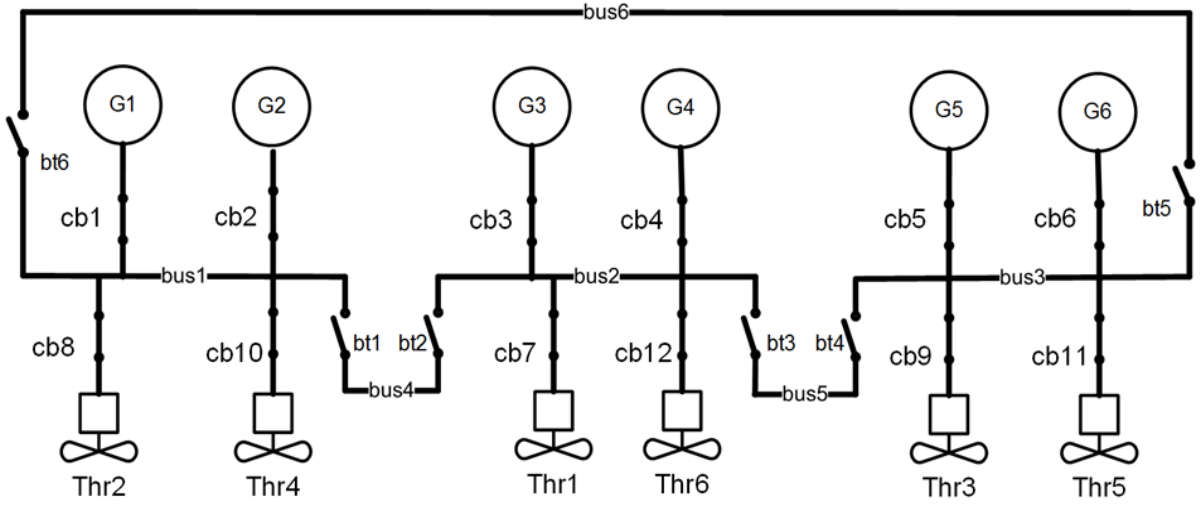


Comparison between Level 1, 2 and 3 - Drillship

Description	Unit	Value
Length between perpendiculars	m	230
Breadth	m	42
Operating Draught	m	12
6 x azimuth thrusters	kW	5500

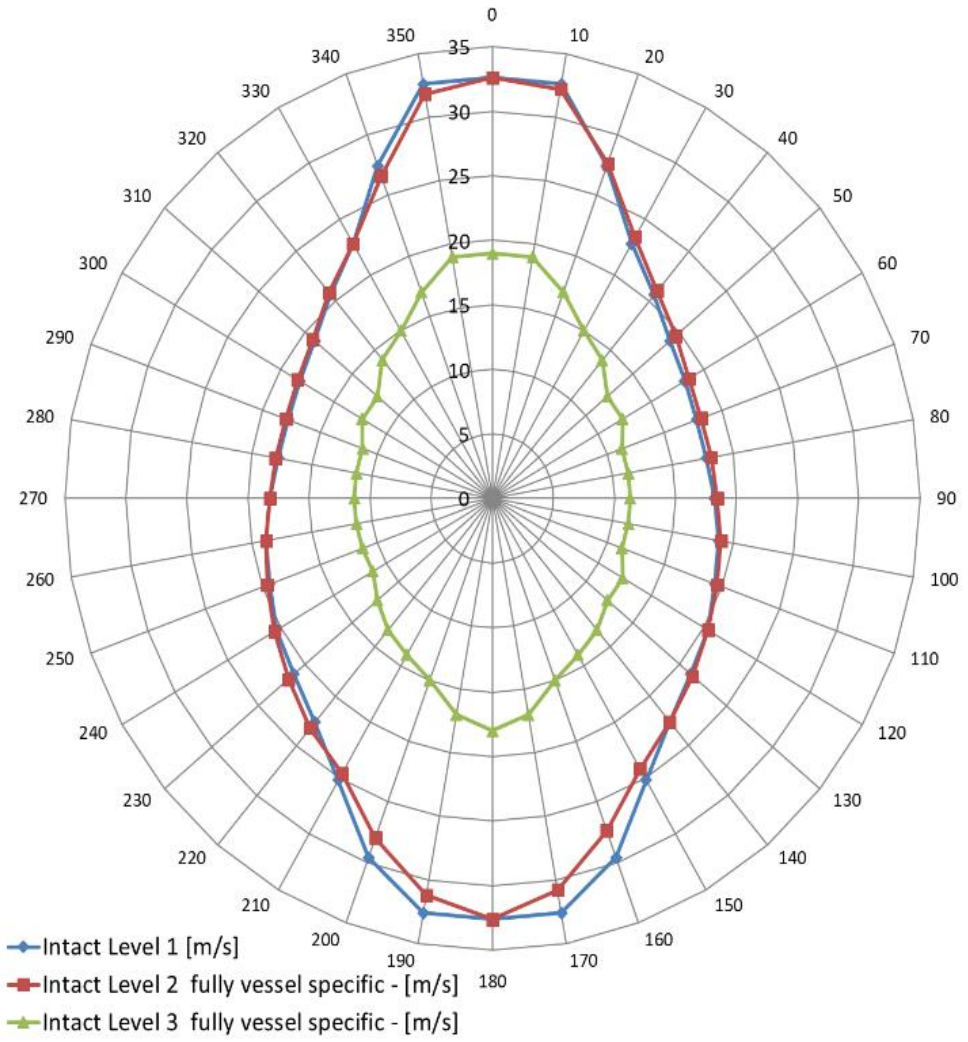


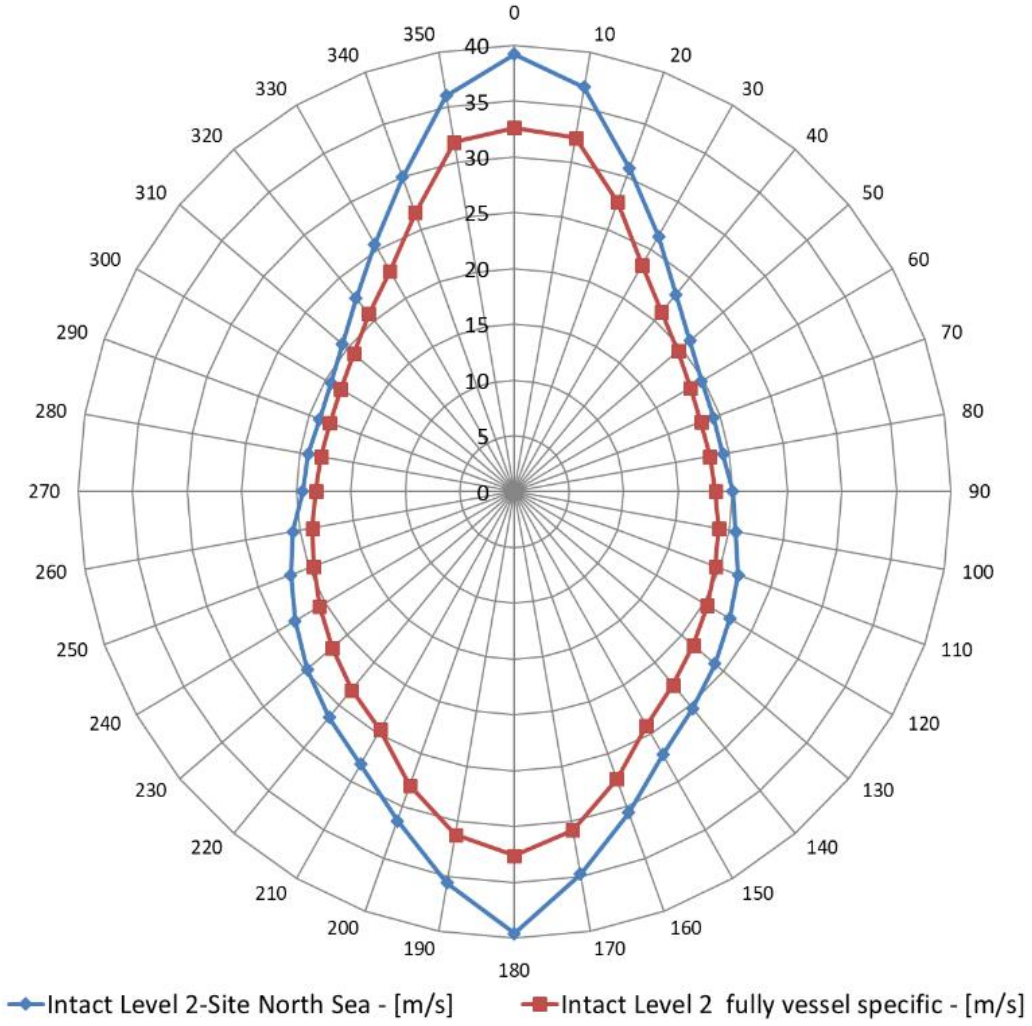




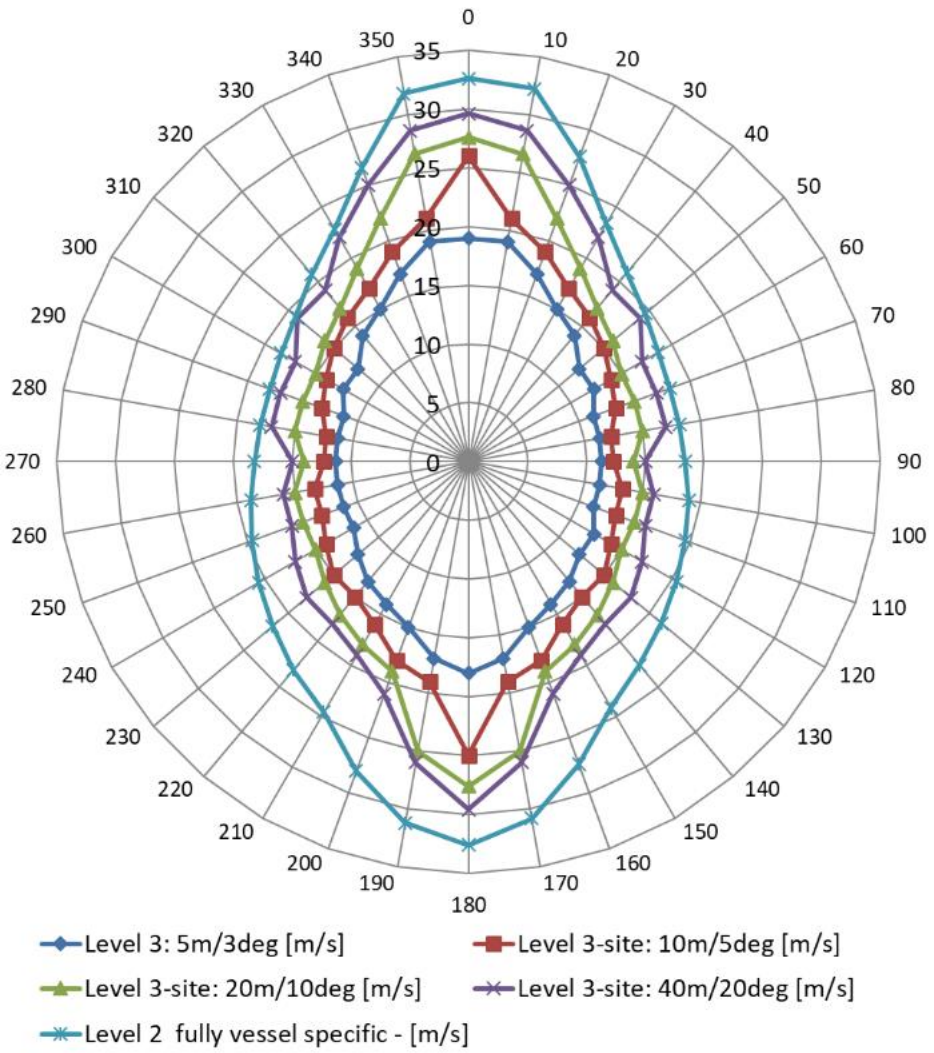
3 – split power configuration

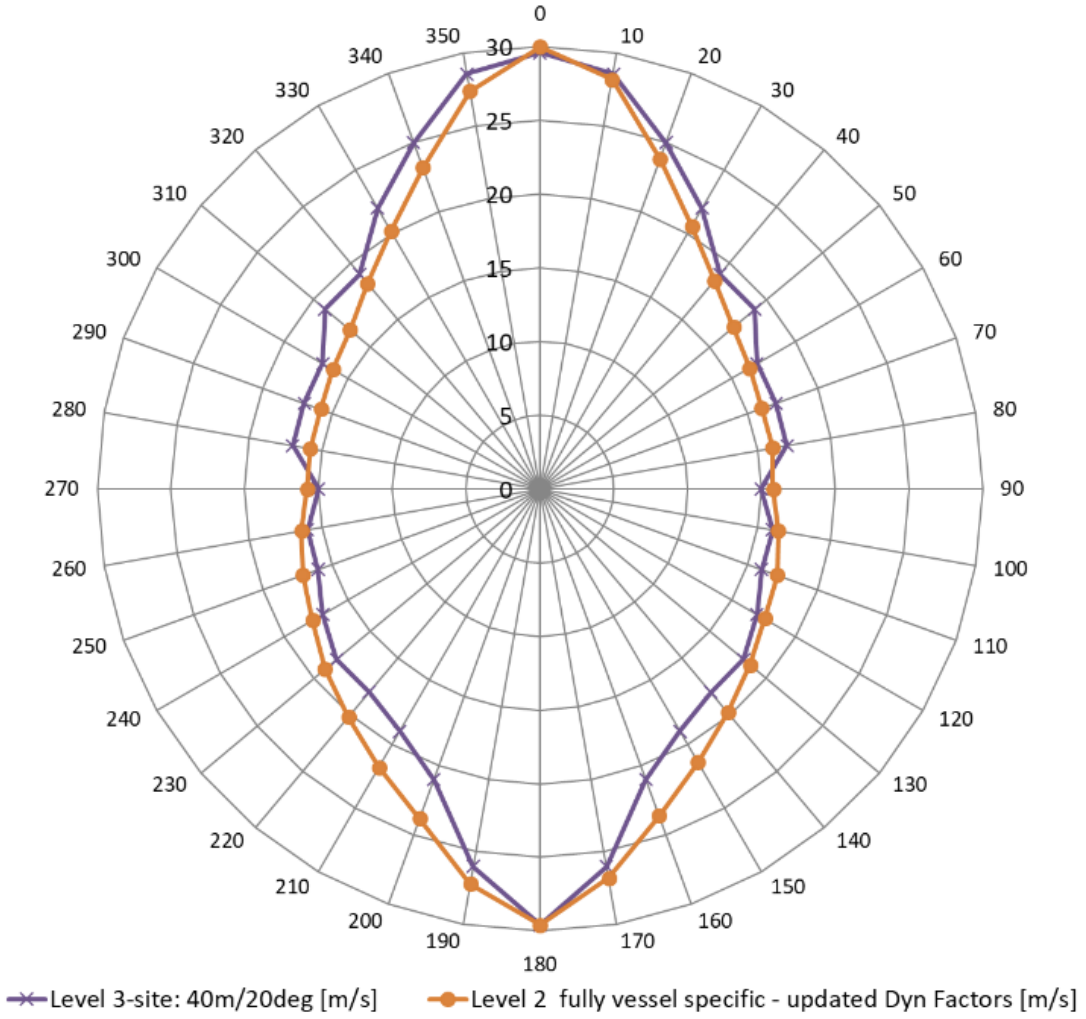
Comparison between Level 1, 2 and 3 – Drillship – intact conditions



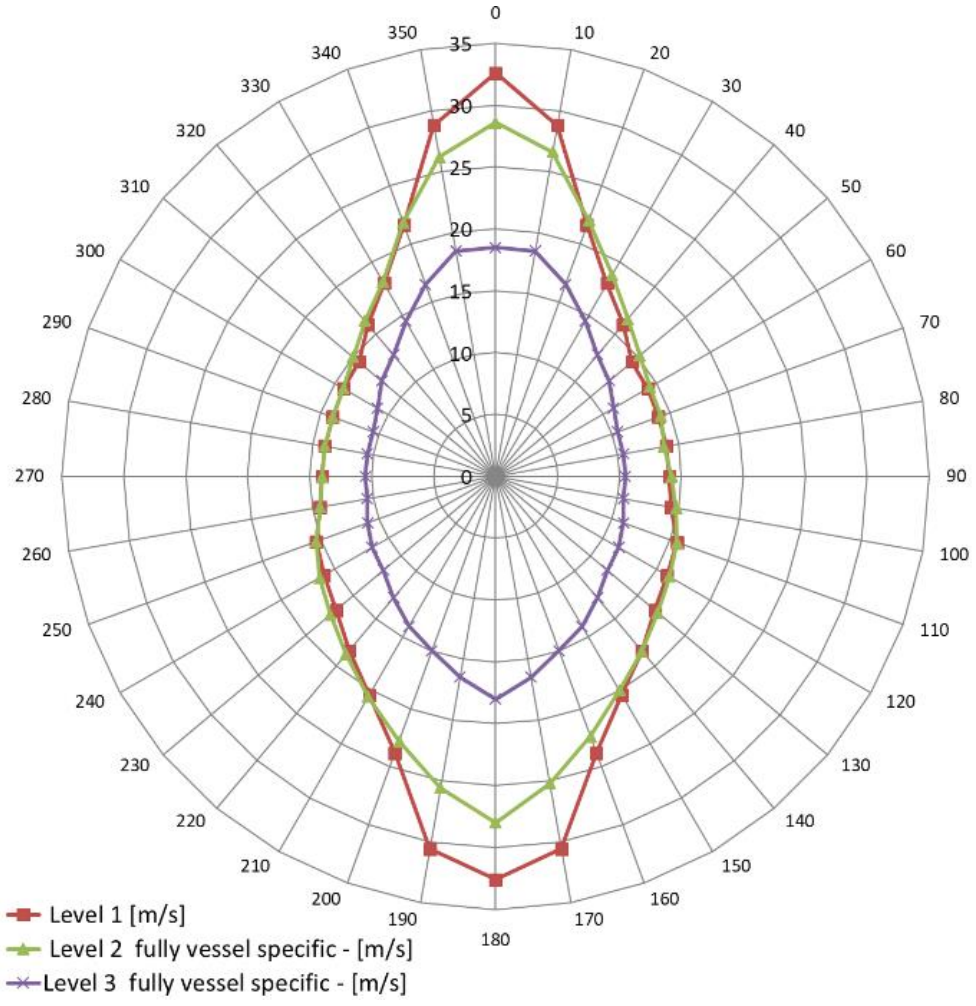


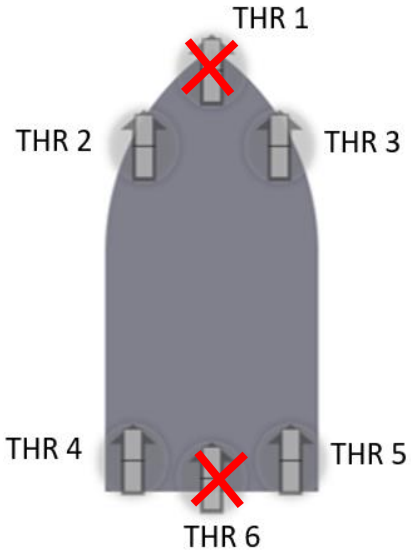
Comparison between Level 1, 2 and 3 - Drillship – intact conditions

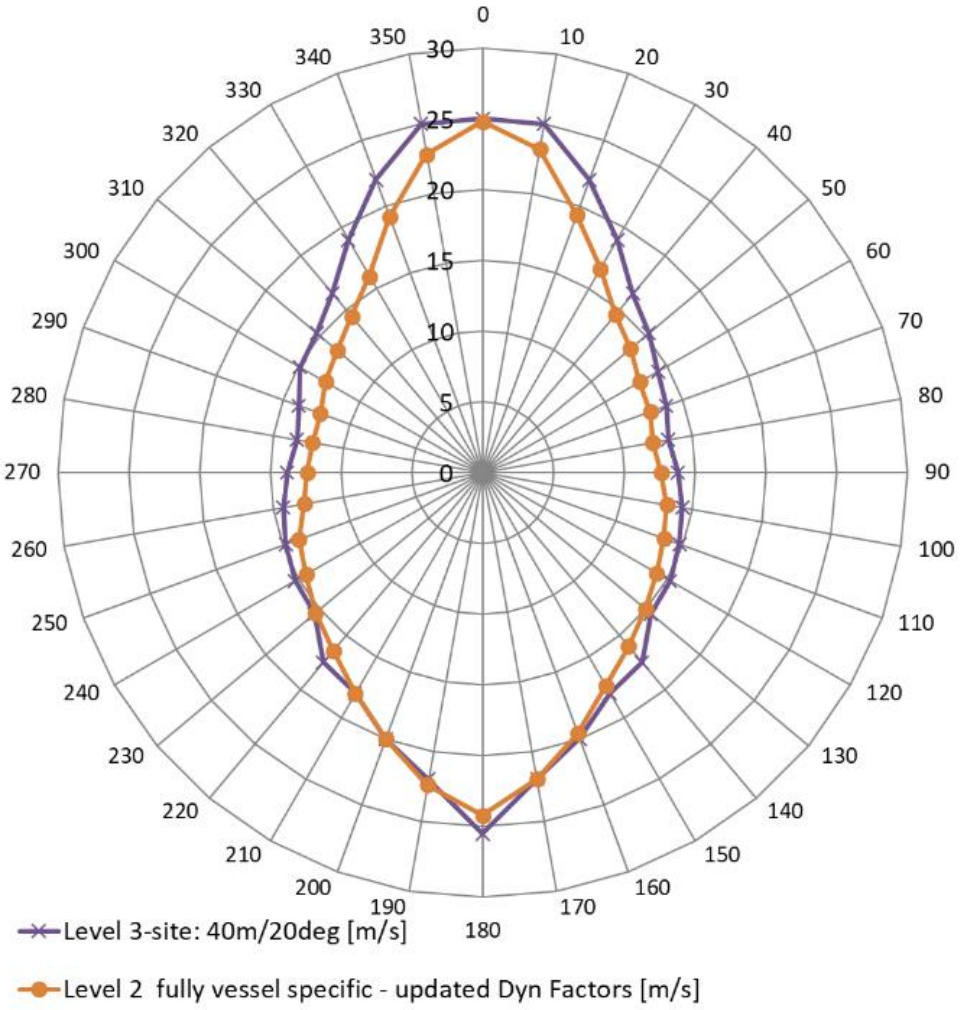




Comparison between Level 1, 2 and 3 – Drillship – Loss of THR 1 and 6

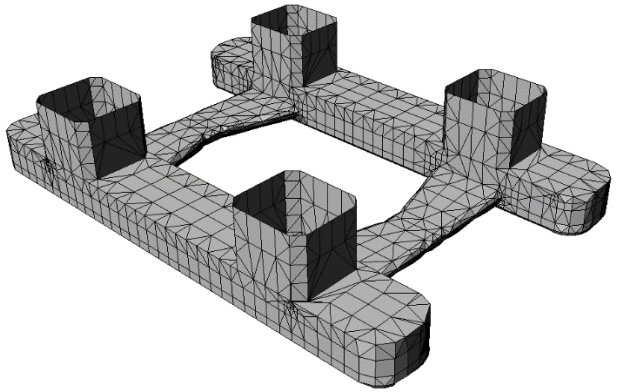


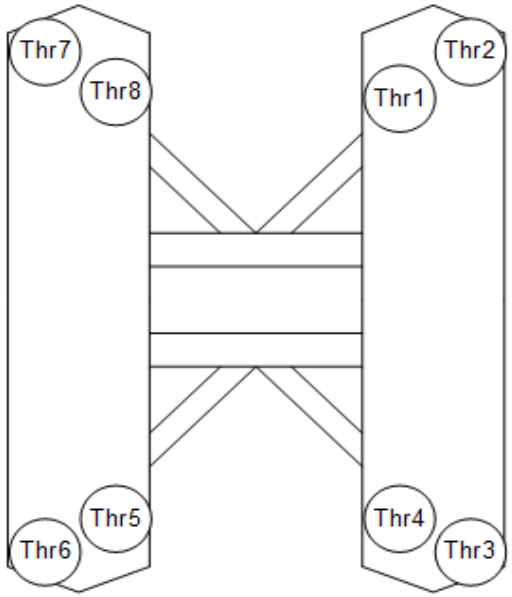


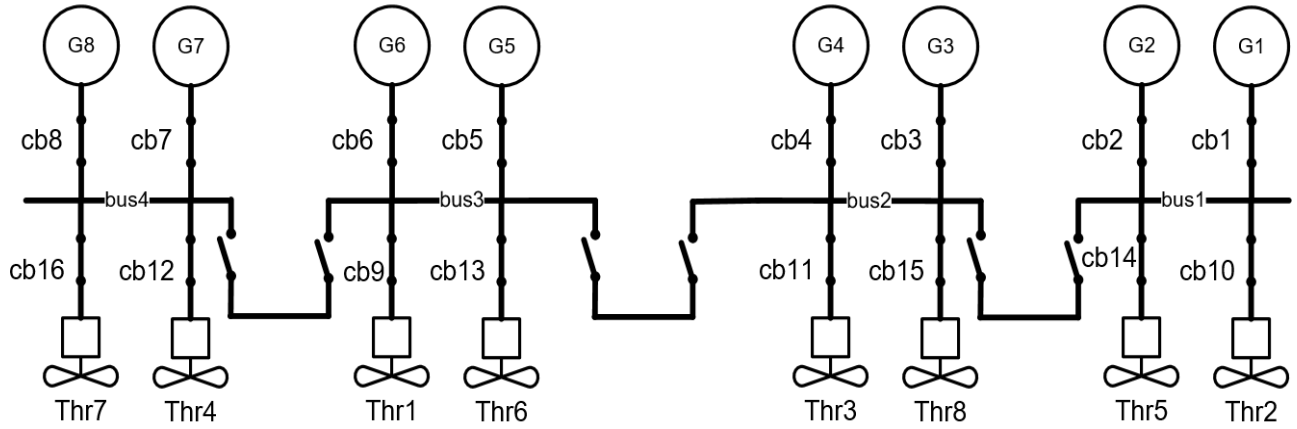


Comparison between Level 1, 2 and 3 – Semi-submersible drilling rig

Description	Unit	Value
Length of the pontoons	m	120
Breadth over all	m	95
Breadth of pontoons	m	23
Operating Draught	m	24
6 x azimuth thrusters	kW	6500

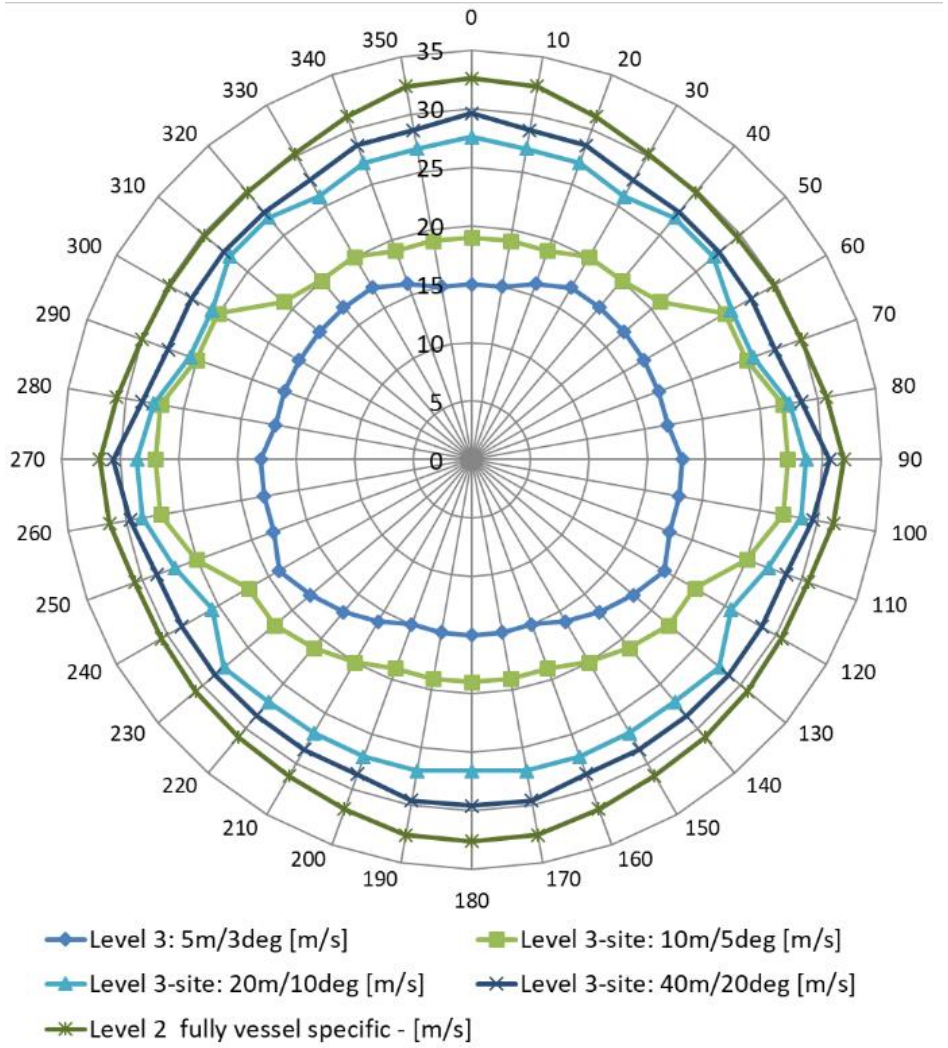


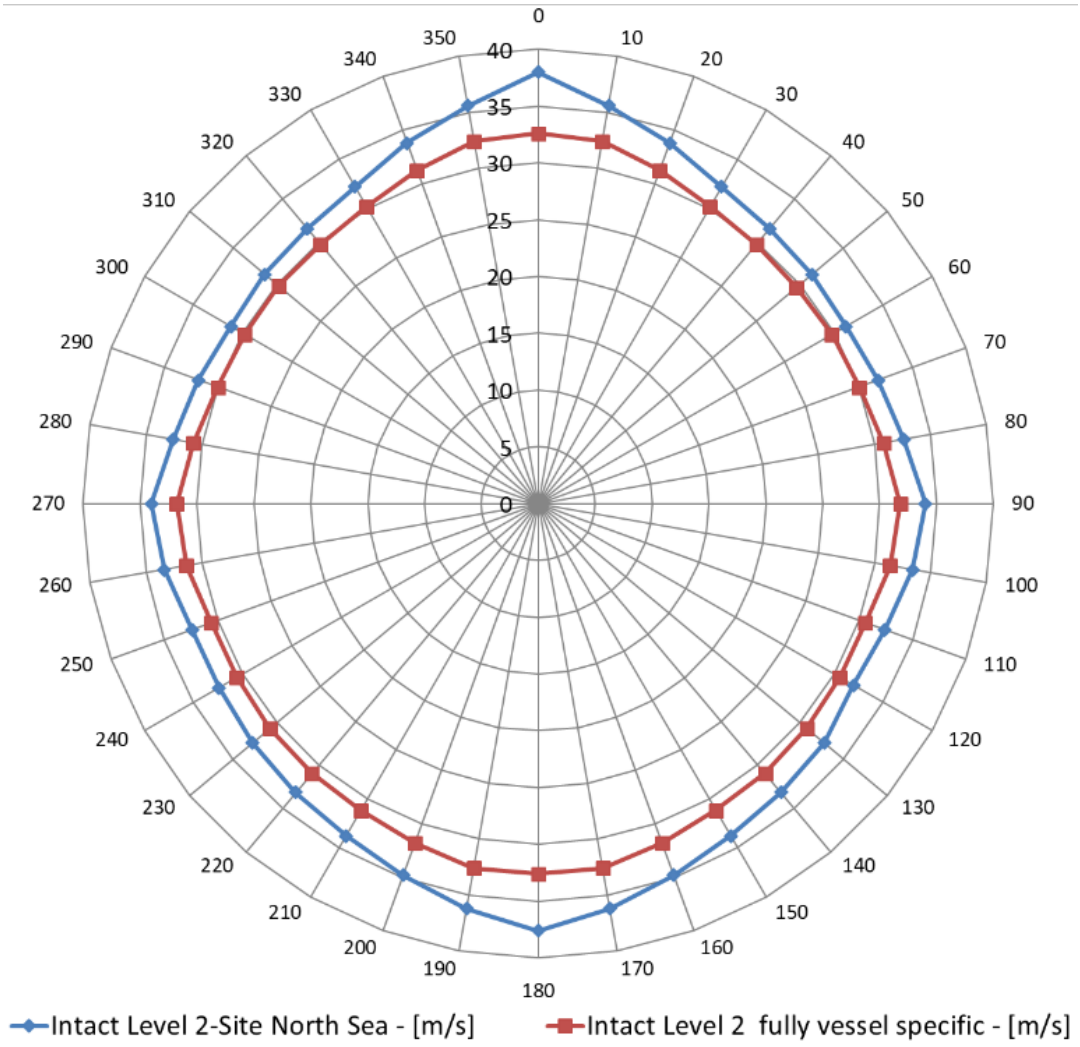




4 – split power configuration

Comparison between Level 1, 2 and 3 – Semi-submersible drilling rig - intact





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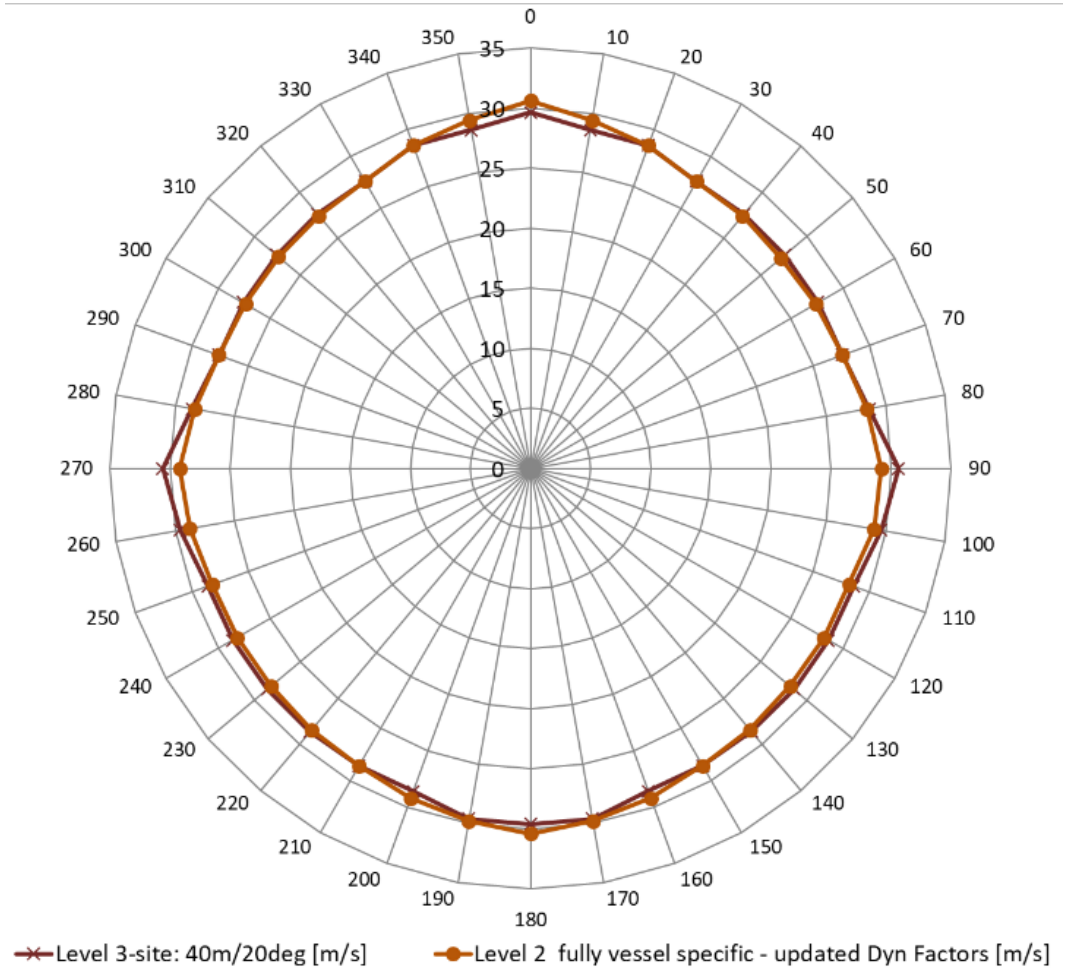
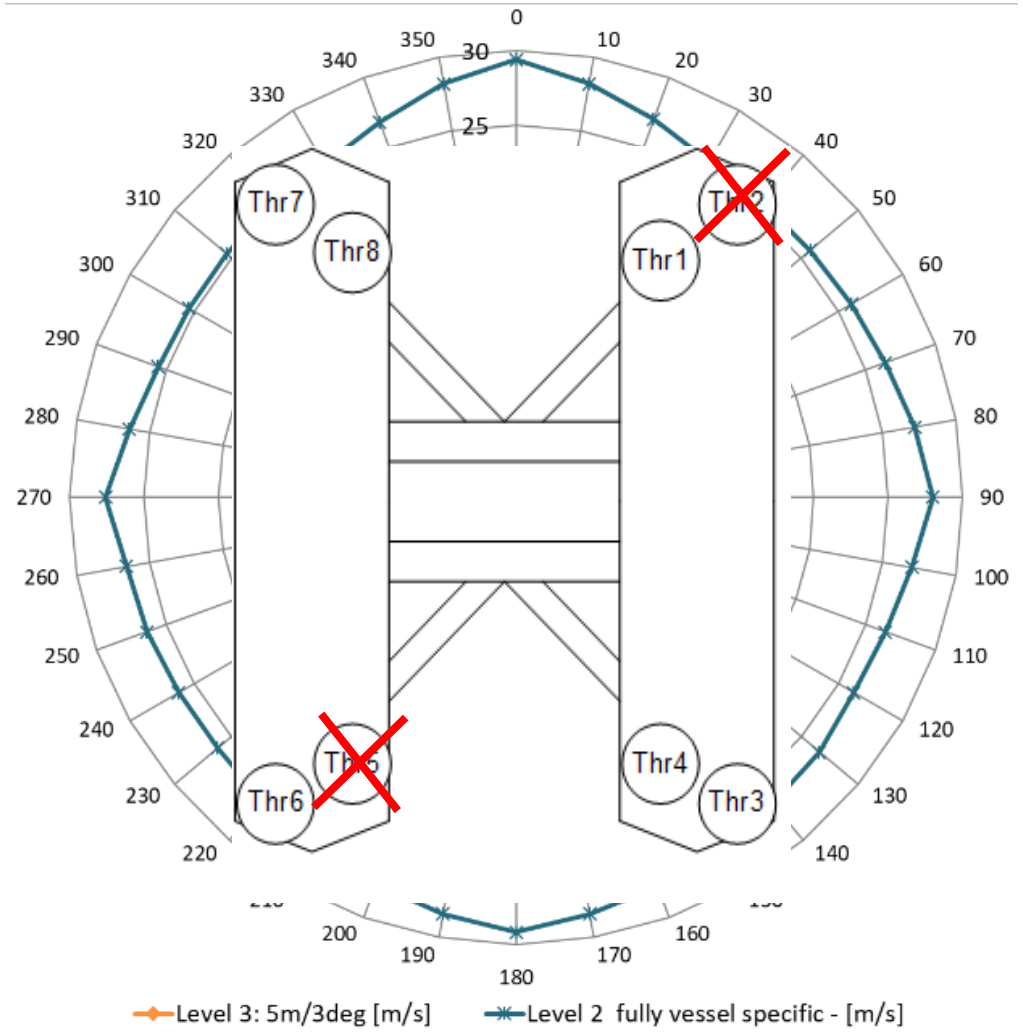
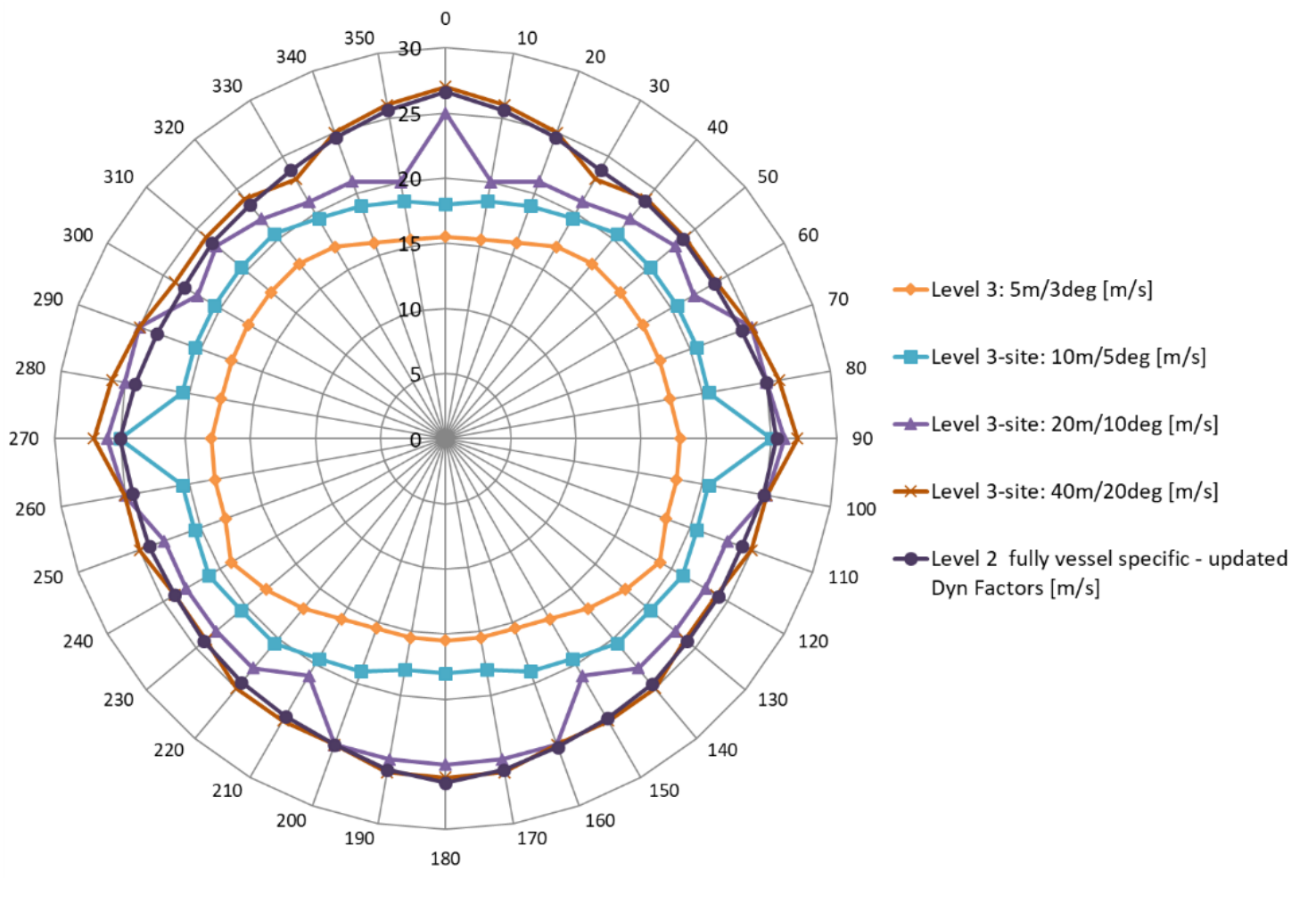


Comparison between Level 1, 2 and 3 – Semi-submersible drilling rig – Loss of Thr 2 and 5





Guidelines on how to apply different levels

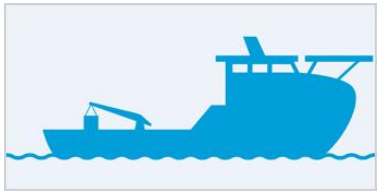
Level	Typical use	Value for users	DP operation requirements
Level 1	• High level DP capability assessment • **Vessel performance comparison** • Want to perform first screening when many vessels will be submitted to the bid	• **Prescriptive method: Consistent and comparable results** • Improve decision input for choosing vessels • Free Web-App • Easy to deliver class required DP capability assessment numbers	• Wide vessel footprint is acceptable • Operator/owner familiar with the operation and the vessel station-keeping capability has been proven • Enough time to react to vessel failures • Mild environmental conditions
Level 2	• **When vessel specific parameters are important**	• Take advantage of **equipment/vessel specific performance** • For other hull shapes then mono hulls	• Wide vessel footprint is acceptable. It is sufficient to know in which conditions the vessel will drift off (the vessel footprint is not important to know) • Operator/owner familiar with the operation and the vessel station-keeping capability has been proven
Level 2-Site	• **When site specific environmental conditions are important** • When **external forces** are important	• Use **site specific weather** and to take in to account external forces • **Preliminary operational planning** • **Preliminary vessel design**	• Wide vessel footprint is acceptable. It is sufficient to know in which conditions the vessel will drift off (the vessel footprint is not important to know) • Operator/owner familiar with the operation and the vessel station-keeping capability has been proven

Guidelines on how to apply different levels

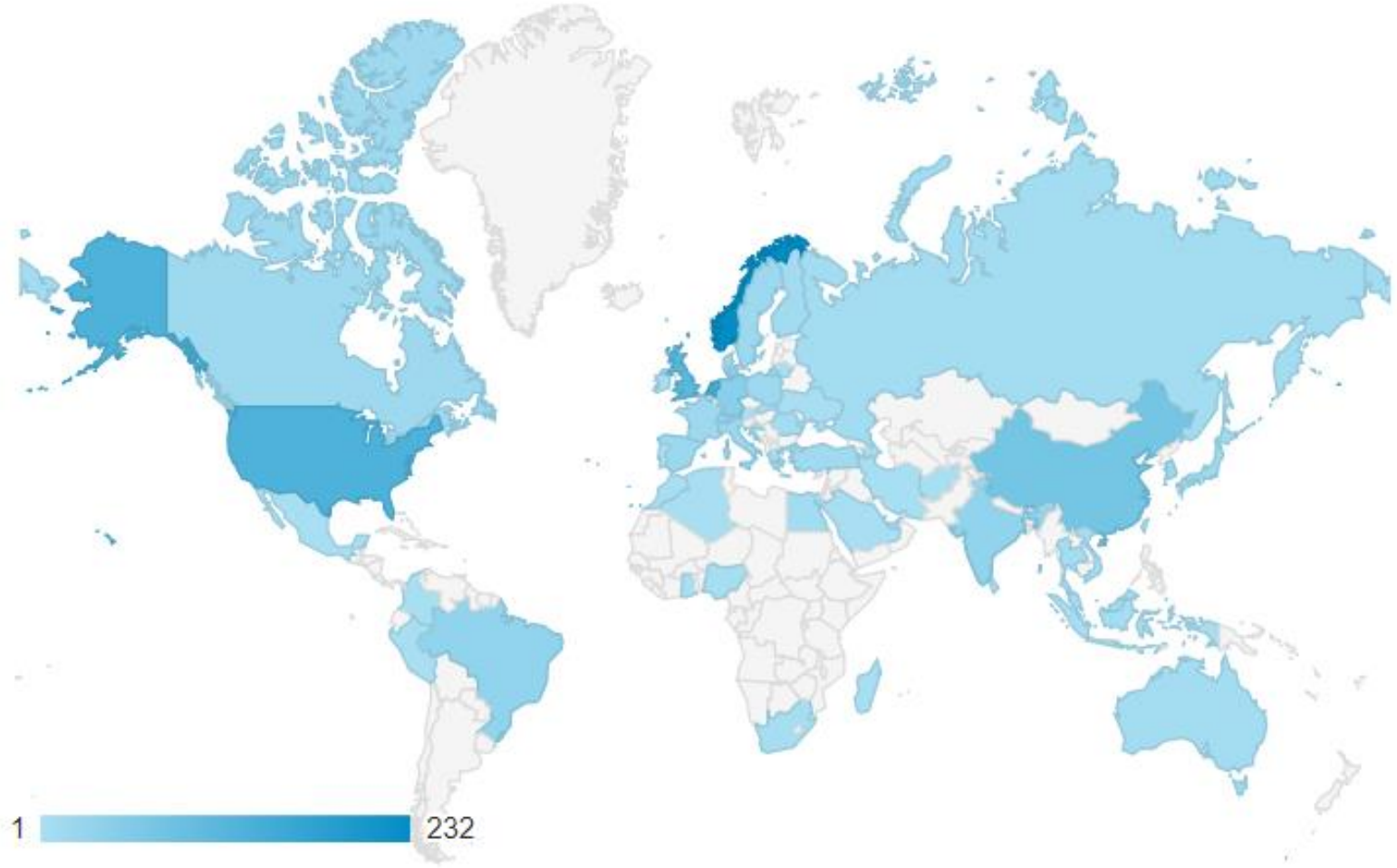
Level	Typical use	Value for users	DP operation requirements
Level 3	• **When vessel and equipment dynamics are important** (e.g. position, heading or other motion in other degrees of freedom, thruster/power dynamics, gangway motion, etc.) • **Vessel performance comparison**	• Compare vessels including vessel dynamics • Improve decision input for choosing vessels	• An indication of the vessel footprint and weather operating window considering non-specific site conditions and operating criteria is sufficient
Level 3-Site	• **More information on vessel performance** (for new concept designs, planning of and vessel selection for critical operations, site specific analysis and inclusion of external forces) • **When vessel and equipment dynamics are important** (e.g. position, heading or other motion in other degrees of freedom, thruster/power dynamics, gangway motion, etc.)	**Designers and yards** • **Right size** vessels, realistic fuel consumption calculation and operability • Battery sizing **Operators and DP vessel owners** • Better data for choosing the right vessel for specific operations in a specific environment • Improved planning, improved operating limits – improved risk control • Operational and contingency planning	• Important to know the vessel footprint • Little experience with the vessel station-keeping capability • Operations where the DP motion cannot be neglected • Harsh weather and challenging operating conditions • Little time to reaction to loss of position • Drilling operations in shallow water and harsh environment, diving, transfer of personnel with Walk2Work vessels, flotels very closed to a platform, vessel with limited capability of changing heading, offshore loading operations

DP Capability Level 1 web-app – Google analytics

1700 users

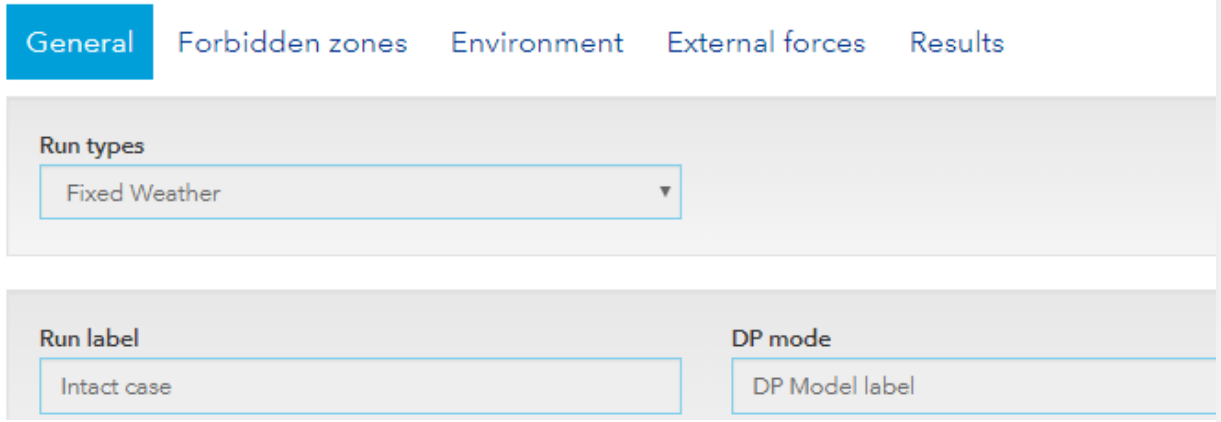


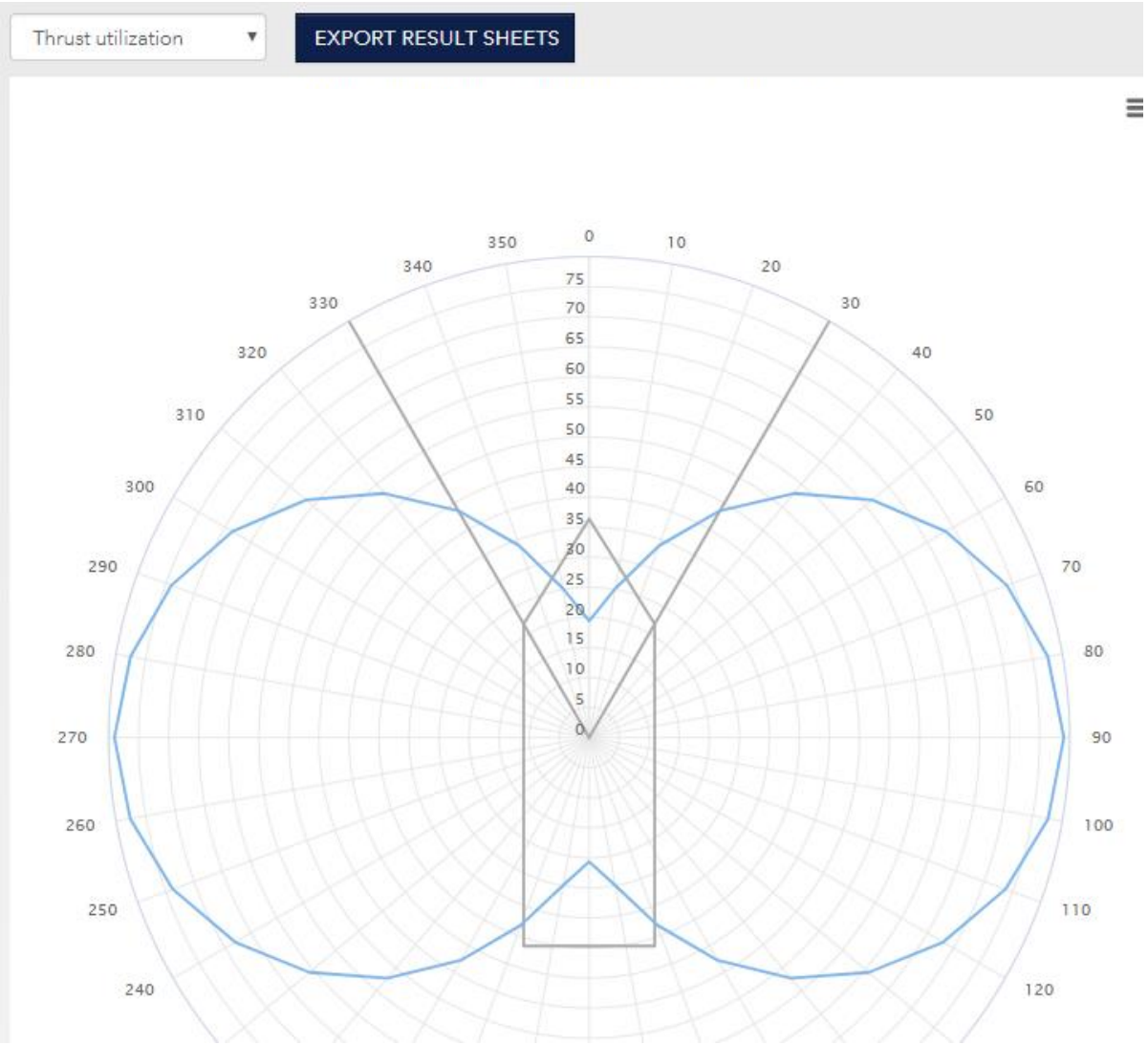
2000 Vessel



Updates on the Web-app

- Fixed weather runs
- Improved guidance and input data validation
- Improved calculation speed
- Added thruster tilt
- Implemented changes based on the new version of the standard





Level 2 and Level 2-Site – Premium subscription

Feature	Basic	Premium
Results shown in the app	✔	✔
Class approval request for the calculation available in the app	✔	✔
Automated reporting	✔	✔
Supports most common power and propulsion configurations	✔	✔
Support for closed bus-tie power configurations	✔	✔
Supports batteries as power source	✔	✔
Support a vessel fleet	✔	✔
Level 1 Calculation	✔	✔
Level 2 and 2-Site calculations	✖	✔
Supports user defined environmental conditions	✖	✔
Inclusion of constant external forces	✖	✔
User defined heading resolution	✖	✔
Possible to compare vessels results	✖	✔
Display of decimals in the BF numbers (BF 7.6)	✖	✔
Export results to Excel CSV formats	✖	✔

Yearly Fee + pay per run

Yearly Fee for unlimited runs

Practical experiences and guidelines on how to use DNV GL DP Capability standard ST-0111

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www.dnvgl.com

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