

Grid33 shared mooring farm

The Grid33, [1] [2], shared mooring farm consists of 9 INO WINDMOOR 12MW, [3], reference floating wind turbines (FWTs) at a water depth of 350 m arranged into a square grid as shown in Figure 1. Each FWT is connected to four lines, with the column supporting the tower containing two fairleads.

A 50-ton clump is attached to the center of the shared line to keep it taut.

The anchor line footprint is 2.5 times the water depth, and the FWTs are initially spaced $8D$ apart, where D is the rotor diameter ($D = 216.9$ m).

A summary of the mooring system properties is provided in Table 1.

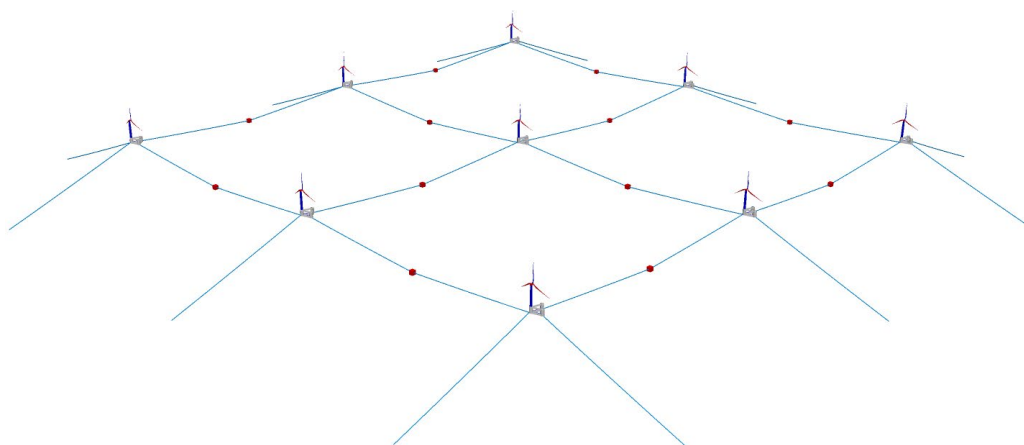


Figure 1 Grid21 shared mooring park

Property	Unit	Shared line	Anchor line
Line material	-	Polyester	Polyester
Line diameter	mm	263	263
MBL	MN	18.64	18.64
EA/MBL	-	27	27
Dry mass coefficient	kg/m	44.4	44.4
Wet mass coefficient	kg/m	11.1	11.1
Unstretched length	m	1657	935
Pretension	MN	3.7	4.0

Table 1 Mooring system properties for Grid33

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Example case:
Grid33 shared
mooring farm



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Note that the example model shows instability in the pitch-surge response due to negative aerodynamic damping at wind speeds of 12-14 m/s, as the current model uses the same controller as the reference FWT model. The controller might require modification to achieve better performance in the current setup, and it is left for future work.

Acknowledgements

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References

- [1] V. Ramachandran Nair Rajasree, Y. Jenssen, T. Sauder, and E. Bachynski-Polic (2026): *Dynamic behaviour of floating wind farms with shared mooring in waves - Part I: Cyber-physical testing* [UNDER REVIEW]
- [2] V. Ramachandran Nair Rajasree, T. Sauder, and E. Bachynski-Polic (2026): *Dynamic behavior of floating wind farms with shared mooring in waves - Part II: Modal description, and mooring line model fidelity*, [UNDER REVIEW], 2026.
- [3] C. E. Silva de Souza, P. A. Berthelsen, L. Eliassen, E. E. Bachynski, E. Engebretsen, and H. Haslum (2024): *Definition of the INO WINDMOOR 12 MW base case floating wind turbine*. SINTEF Ocean, 2021. Accessed: Sep. 14, 2024. [Online]. Available: <https://sintef.brage.unit.no/sintef-xmlui/handle/11250/2723188>