ECHEVERRY

Sara

PhD Candidate at University of Liège

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Keywords: Floating offshore wind turbine, collision, structural design

MISSION

F.R.I.A fellow

Development of analytical developments to assess crashworthiness of floating offshore wind turbines (spar type).

The increase in offshore wind energy is making it more probable to have a collision between a ship and a floating offshore wind turbine. Design standards require collision scenarios to be investigated during the design process. The resistance of fixed offshore wind structures impacted by a ship has been deeply studied, using mainly numerical or analytical methods. Some studies have also been performed on floating structures in general, however, regarding the crashworthiness of FOWT, it has not been deeply studied yet.

Numerical simulations have already been performed in this matter for few specific collision scenarios. In order to perform a complete risk analysis of a new structure design, several scenarios are needed, for which FEA require large computational time, this actually makes it improper for such studies.

A simplified method is then a suitable solution for this purpose and it is the aim of this PhD thesis.

EDUCATIONAL BACKGROUND

Ph.D. Candidate

Université de Liège

September 2016 - Current

F.R.I.A fellow.

Dissertation title: "*Development of a code based on the Super-Element method to assess the crashworthiness of a floating offshore wind turbine (spar type)*"

M.Sc. in Advanced Ship Design (EMship)

Université de Liège & École Centrale de Nantes

Oct 2014 - Feb 2016

Joint Master Degree consisting in three stages:

- Master in Naval Architecture (Université de Liège)
- Master in Hydrodynamics, Energy and Propulsion (École Centrale de Nantes)
- Complementary Diploma in Offshore Structures (Rostock University)

Thesis title: "Optimization of Twisted Rudder with Bulb and Hub Cap"

Bachelor of Engineering in Aeronautical Engineering

Universidad Pontificia Bolivariana (UPB)

Jan 2008 - Dec 2013

Thesis title: "*Design of a portable vertical axis wind turbine*"

PUBLICATIONS

https://orbi.uliege.be/browse?type=authorulg&rpp=20&value=Echeverry+Jaramillo%2C+Sara+p185871

https://independent.academia.edu/ECHEVERRYSARA

https://www.researchgate.net/profile/Sara_Echeverry_Jaramillo

Journals

- Pire, T., Echeverry, S., Rigo, P., Le Sourne, H. (2018). Analytical formulations to assess the energy dissipated at the base of an offshore wind turbine jacket impacted by a ship. Marine Structures(59):192-218

  https://www.sciencedirect.com/science/article/pii/S0029801819307735

Conferences

- Echeverry, S., Marquez, L., Rigo, P., Le Sourne, H. (2019). Numerical Crashworthiness Analysis of a Spar Floating Offshore Wind Turbine Impacted by a Ship. ICCGS Lisbon, Portugal

- Echeverry, S., Rigo, P., Le Sourne, H., Bela, A., Pire, T. (2017). Design methods to assess the resistance of Offshore Wind Turbine Structures impacted by a ship. EACWE Liege, Belgium

Articles in book

- Rigo, P., Caprace, J-D., Sekulski, Z., Bayatfar, A., Echeverry, S. (2018).Structural Design Optimization – Tools and Methodologies. Holiship Chapter 9. Springer, ISBN 978-3-030-02809-1

  https://www.springer.com/gp/book/9783030028091

WORK EXPERIENCE

Engineering Intern

Avianca, Colombia

Feb 2013 - Jul 2013 (6 months)

Systems and components engineering intern.

Research engineer

UPB, Colombia

Jul 2013 - Feb 2014 (6 months)

Design optimization of a portable vertical axis wind turbine

Master Student Intern

DNV-GL, Germany

Jul 2015 - Oct 2015 (4 months)

The master thesis of EMship course was developed.

SKILLS

Languages

Spanish (Native), English (fluent), French (fluent) and German(intermediate).

Computer skills

Computational Fluid Dynamics, Computed Aided Design, basic programming (Python, Matlab).