



WETFEET

D8.4 – Two physical demonstration models

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Two physical demonstration models for public presentations			
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3	
4	
5	

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EXECUTIVE SUMMARY – Teamwork Technology

This report presents Deliverable 8.4 of the WETFEET H2020 project – Two physical demonstration models.

Teamwork Technology built two physical 3D models to demonstrate to public audiences how the breakthrough components of the Symphony and the OWC spar buoy wave energy converter work.

The models have been made using 3D printers and were completed by mid-October 2016.

1. Introduction

Within the framework of the WETFEEET H2020 EU funded project, a set of breakthroughs have been identified to address the obstacles that have been delaying the path towards commercialization of the wave energy sector. For the sake of the dissemination of some of the project's key findings, two physical models have been built in September/October 2016 in order to present how the breakthrough components integrate and work.

The physical demonstration models are scale models that have been made using 3D printers. Two models have been made: Model 1: Tetra radial air turbine of the OWC spar buoy; and Model 2: Breakthrough components of the Symphony.

2. Physical model description

Model 1 Tetra-radial air turbine of the OWC spar buoy

Within WETFEET, IST has investigating alternative innovative options for a turbine to be integrated in the OWC device. The work has culminated with the building of a novel tetra-radial air turbine. IST supplied Teamwork technology a 3D model of the Tetra-radial turbine. Each separate component is shown in Appendix I

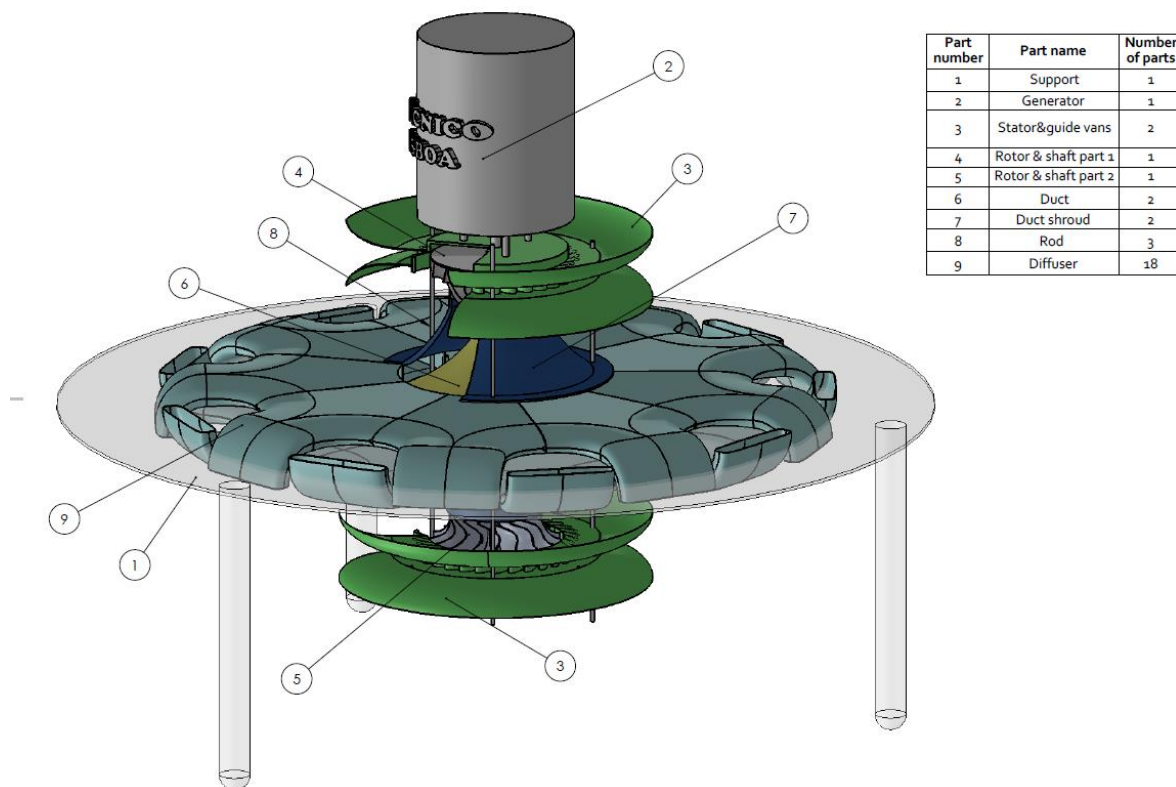


FIGURE 1 TETRA-RADIAL AIR TURBINE DRAWING

Teamwork Technology made some adjustments to the model to make it suitable for 3D printing. Which were the following:

- Adjusting Diffuser connections
- Thickening the diffusers
- Thickening Duct and duct shroud components
- Changed M2 rods for M3 rods to improve the model strength

As a result, the following model has been built:



FIGURE 2 3D MODEL OF THE TETRA RADIAL AIR TURBINE

The turbine model is a 1:5 scale model of the full-scale tetra-radial turbine. The rotors are able to rotate by hand. The size of the total assembly is: diameter*height = 45*35 centimeters.

Model 2 Breakthrough components of the Symphony

Teamwork Technology is building a novel water turbine for the Symphony device. A model of the Symphony has been made which shows where the turbine is placed. A model of the Novel water turbine has been made(Scale1:5). The 3D drawings of the turbine are shown in the image below:

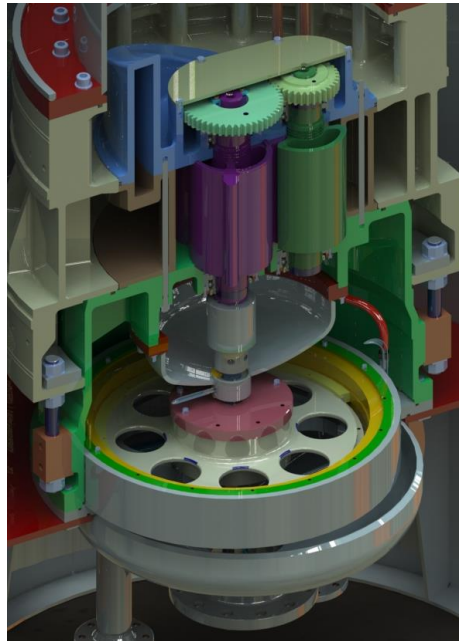


FIGURE 3 SYMPHONY NOVEL WATER TURBINE DRAWING

The turbine design has been simplified to be printable using the program Solidworks. As a result, the following model has been built:

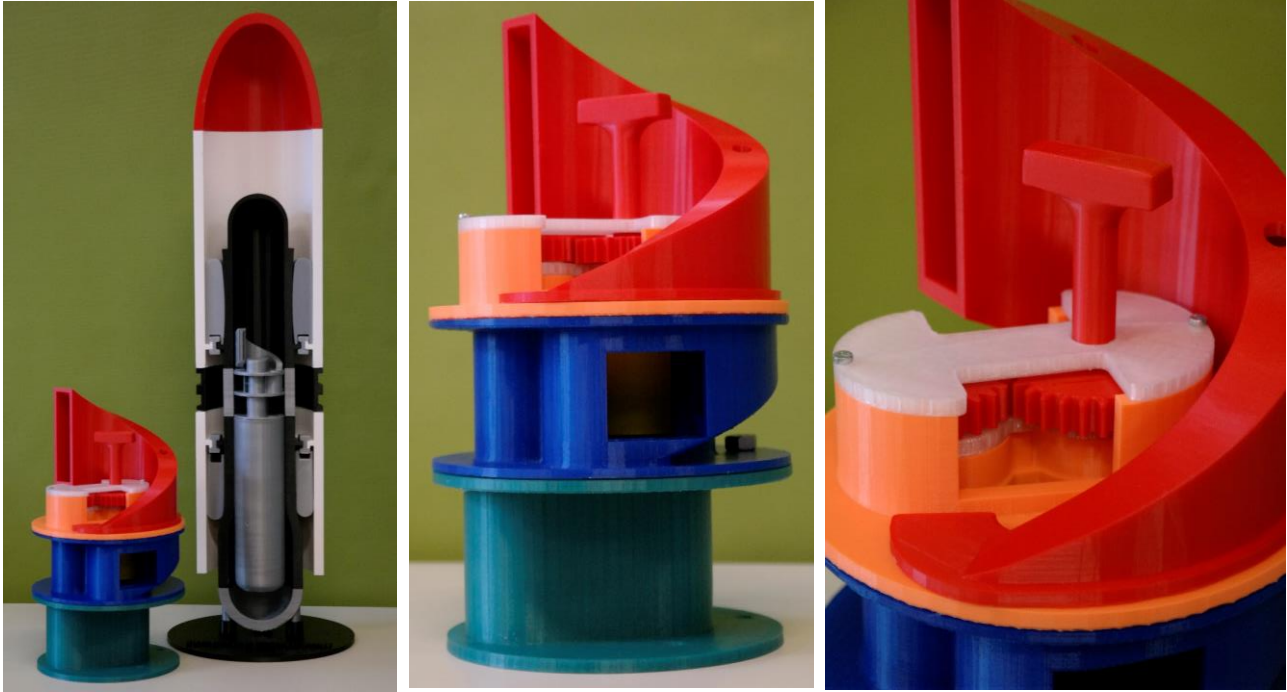


FIGURE 4 3D MODEL OF THE SYMPHONY BREAKTHROUGHS

The turbine runners can rotate by hand. The housing of the turbine has holes on the laterals to show how the breakthrough components work. The assembly size of the turbine is: diameter*height = 15*30 centimeters and the Symphony: diameter*height = 15*68 centimeters.

3. Conclusion

The physical models were successfully implemented and can be used to present how the WETFEEET breakthrough components work. The models will be exhibited at conferences and workshops, aiming to promote the engagement of stakeholders, industry and the public at large. In particular, the configuration of the models facilitates the understanding not only of the working principle of the breakthroughs, but also of the way they can be integrated into other types of wave energy devices. Naturally, it is expected that the models will work as a powerful tool to demonstrate the impact of the WETFEEET project.

The Symphony model has been used during the Offshore Energy Exhibition 2016 in the Netherlands (see appendix II).






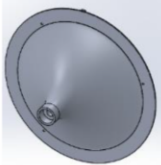

Appendix I Tetra-radial turbine 3D model components

Tetra-radial turbine 3D model

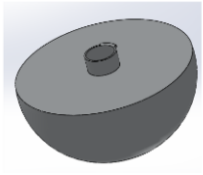
Next table presents all the parts to be printed in order to build the Tetra-radial turbine 3D model.

There are additional parts, which will be supplied by IST.

The model will be assembled at IST.

Part name	Number of parts	File name	Additional file name	Image
Generator	1	gerador_3D.sldprt	---	
Diffuser 3D	18	difusor_3D.sldprt	---	
Rotor & shaft part 1	1	rotor_3D.sldasm	hub_3D.sldprt pa_rotor_3D.sldprt	
Rotor & shaft part 2	1	rotor_3D_2.sldasm	hub_3D_2.sldprt pa_rotor_3D.sldprt	
Stator & guide vans	2	Assembly_pecas_1.sldasm	estator_disco_3D.sldprt Assembly_pecas_2.sldasm estator_disco_2_3D.sldprt guide_van_3D.sldprt	
Duct	2	conduta_3D.sldprt	---	
Duct shroud	2	shroud_3D.sldprt	---	

Lisbon, 15th September 2016

Cover	1	tampa_veio_3D.sldprt	---	
TOTAL	28			

Appendix II Offshore Energy Exhibition 2016



Appendix III 3D models

