

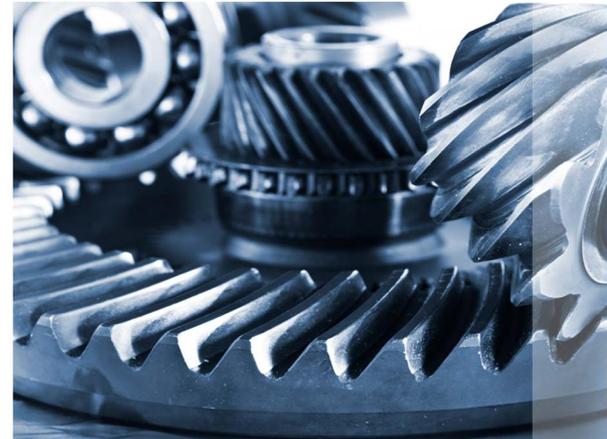


Augmentias

Maritime & Offshore Engineering

" Multi-disciplinary engineering design, analysis and solution providers "

www.augmentias.com



Services

Structural Engineering

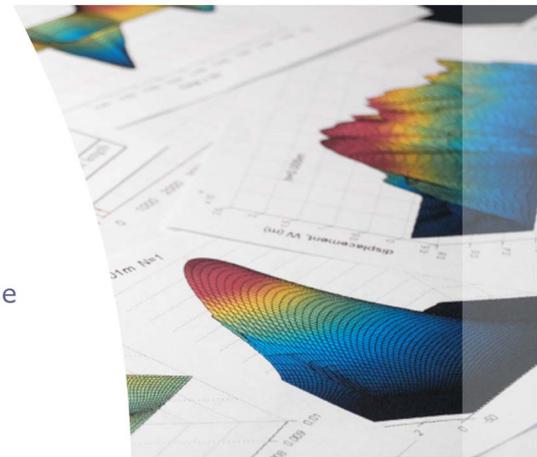
Experienced with a range of international structural design codes, offshore industry specific and certification authority standards and practices. Augmentias will deliver sound engineering analysis to meet your needs and satisfy third party requirements.

Mechanical Engineering

Our engineering team integrates mechanical analysis, fluid analysis and design skills with our other key disciplines to ensure we are aligned with your project goals from the outset.

Naval Architecture

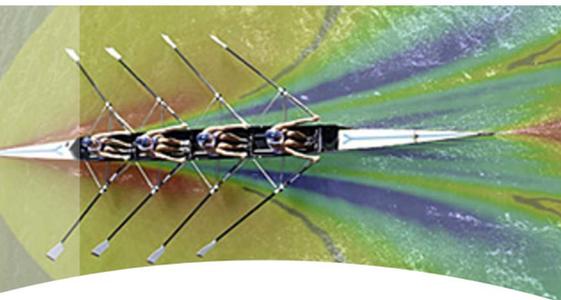
Structural modification of vessels; assessment of load out, marine operations and sea fastening; and failure analysis are key services we provide to the offshore and renewable sectors. Augmentias has completed work on offshore supply vessels, MODU and semi submersibles; and undertaken failure analysis of bulk carriers.



Materials Science

The offshore climate is harsh, corrosive and unpredictable. The correct use of materials, including exotic, materials in the right place can make the difference in cost, weight and maintenance for any project in the marine environment.

Our experience includes rubbers and elastomers for vibration isolation, seals and impact protection; foams and syntactics for buoyancy and fenders; composites and thermoplastics for hulls, tanks and structures; and super duplex stainless steel, aluminium and titanium alloys for fastenings and pipework.



Technical Authority

Augmentias undertakes due diligence and independent verification work. We provide expert advice and representation in relation to litigation, dispute resolution and contractual claims.



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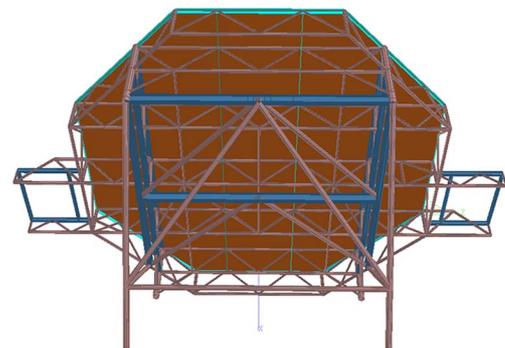
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Projects

Oil Float Rotor Hub

Marine current turbines operate at low rotational speeds. This results in a much higher torque to power ratios than is the case with comparable ships propellers. Consequently, a taper shaft and keyway are inadequate for mounting the rotor of a tidal turbine on a taper shaft when its power output exceeds around 300 kW. In 2012, building upon earlier successes, Augmentias designed and detailed an oil float hub for a 950 kW turbine – the largest open ocean tidal turbine to date.



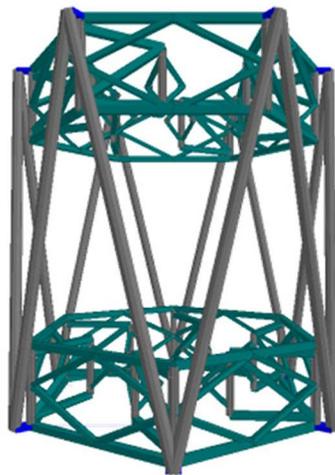
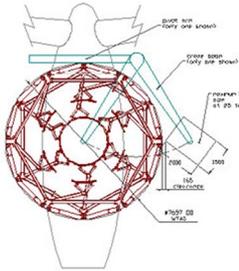
Offshore Helidecks

During 2011 Augmentias undertook work on two helideck support structures. One was a new concept and one was installed thirty six years ago. One is installed on a fixed platform and one is planned for a new vessel. One required meticulous analysis of the structure and the other a FEED study.

Wind Turbine Climbing and Lifting Device

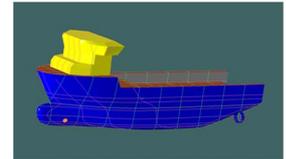
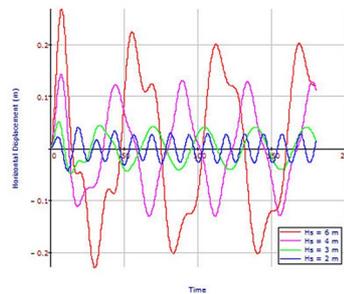
Augmentias applied structural dynamics and materials science expertise to the design of this device. The mechanism was analysed in fourteen different geometric configurations and states of operation over a range of turbine tower diameters and loading patterns.

Modifications were made to reduce weight and improve the structural integrity. The complex hinge joints at the hydraulic ram to main structure connections were completely redesigned as castings and assessed using 3D modelling and FEA techniques.



existing steel casting deck fitting

yield strength	$\sigma_y > 235 \text{ MPa}$	DNV rules for Ships ch2 part 2 section 7 B400 table B2 grade 410W
ultimate strength	UTS $> 410 \text{ MPa}$	
material factor	$\gamma_{M2} = 1.15$	Eurocode EN1993-1-8
design load		
factored design load any horizontal direction	$F_{Ed} = 114 \text{ kN}$	
maximum possible uplift	$F_{Ed,up} = 57 \text{ kN}$	



RWave Offshore Wind Turbine Access System

Augmentias has taken an holistic approach to the development of the RWave which fully integrates an offshore work station and state of the art infield vessel.

The design brief for the RWave was to produce an operationally superior, but commercially viable, system for installation, maintenance and decommissioning of the turbines in offshore wind farms. It is only in this way that interfaces and interactions can be optimised with substantial cost savings.