WavEC’s path in the aquaculture sector

11/2018
WavEC entrance in the Aquaculture sector

WavEC started its participation in the aquaculture sector in 2016

Technology and know-how transfer from the Marine energies to the Aquaculture sector

- Engineering and complex systems modelling
- Instrumentation and data acquisition
- Independent engineering
- Planning tools for Operation and maintenance strategies
- Resource assessment, design conditions and feasibility
- Strategy & policy advice
- Environmental and socio-economic impact assessment
Objective: Bring mature proven tele-manipulation technologies from the surgical room into the deep sea to perform operations with high precision commonly done by divers.

Work done so far
Participation in R&D international projects to develop tools to support the sector.

KRAKEN\textsuperscript{1} & Artifex\textsuperscript{2} (OceanERA-NET\textsuperscript{1} and Innovation Norway project)
Work done so far
Participation in R&D international projects to develop tools to support the sector.

KRAKEN & Artifex

Background Technology - Tele-manipulation technologies from the surgical sector.
Work done so far
Participation in R&D international projects to develop tools to support the sector.

KRAKEN & Artifex

Is about empowering small ROV’s

AS EASY AS MOVING YOUR OWN ARM

Tele-replication of the Human Hand Motion

OPTIC HUMAN-ROBOT INTERFACE

MECHANICAL DOCKING SYSTEM

ROBOTIC ARMS
Work done so far
Participation in R&D international projects to develop tools to support the sector.

KRAKEN & Artifex

Consortium (Kraken)
- WavEC
- SIANI
- Instituto Superior Técnico
- CADFEM

Consortium (Artifex)
- Maritime Robotics AS
- Argus Remote Systems AS
- Lerow AS
- ACE AS
- SINTEF Fiskeriog havbruk AS
- NTNU
- WavEC
Work done so far
Participation in R&D National projects to develop tools to support the sector.

(Fundo Azul project)

Objective: Design a new platform concept to support offshore aquaculture providing feed and energy based on an array of Oscillating Water Column systems and a central feeding reservoir.

Consortium
- WavEC
- Instituto Superior Técnico
- Secil
- Rota Grega
- Kymaner
Work done so far

Services

- Study of off-grid electric energy production solution for an onshore Aquaculture. Client: Confidential
Work done so far

Services

- Semi closed rigid cages study to improve the passive guiding system design for water recirculation - Hydra Pioneer from Hydra Salmon Company AS and others confidential CFD studies. Client: Global Maritime

Passive guiding system

- Redirects incoming flow inside the structure
  - Promotes circular flow
  - Promotes upward flow

- Patented in Norway and globally (PCT)
Work done so far

Services

- Site selection for the implementation of an Aquaculture system. Client: Jerónimo Martins

Site selection based on a bio-technical-economic evaluation considering different factors such as:

- Site characteristics (water temperature, Waves, Currents and bathymetry)
- Biological evaluation for different species and different locations
- Logistics (distance to port and vessel requirements)
- Technology evaluation (mooring analysis for different locations and depths)
- CAPEX and OPEX costs
WavEC direction and objectives

Deploy in-house support technologies into market:

R&D

SeaScout
Autonomous monitoring system

To be deployed 1st trimester 2019

Bio-Technical-Economic model
From port to market

To be tested in a wave basin 3rd trimester 2019

Market needs and yearly trend

Fishing schedule
Identification of fish, dates and correlation with market prices

Biological model optimization
- FCR
- Growth rate
- Water temperature
- Mortality
- On-line auto-tune

Exploitation plan

Economic analysis optimization

Data-feed and plan update

Operations and Logistics
- Feed
- O&M
- Availability

Implementation
- Fish size
- Feed consumption
- Water temperature
WavEC direction and objectives

Development of new tools and services:

- CFD analysis on flexible structures
- New antifouling paint testing for aquaculture
- Offshore technologies - Digital Twin
WavEC direction and objectives

Support the development of new technologies:

Promote an offshore aquaculture pilot project in Portugal

Support developers and investors in the exploitation of new species and technologies
OUR TEAM

Unique experience and capabilities across a range of integrated skills
WavEC pushing the aquaculture to new boundaries