IAF SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)
Integrated Applications End-to-End Solutions (2)

Author: Mr. Omasan Akporiaye
Clyde Space Ltd, United Kingdom

Dr. Andrew Carrel
Clyde Space Ltd, United Kingdom
Mr. Netan Porwal
Clyde Space Ltd, United Kingdom
Dr. Astrid Werkmeister
University of Strathclyde, United Kingdom
Prof. Malcolm Macdonald
University of Strathclyde, United Kingdom

OSCAR: AN INTEGRATED SERVICE FOR ENHANCED VESSEL MANAGEMENT IN OFFSHORE WIND FARMS

Abstract

In the evolving landscape of renewable energy, offshore wind farms represent a critical component of the global shift towards sustainable energy sources. However, the construction and maintenance of these infrastructures entail complex logistics and significant lifecycle costs, estimated to constitute 20-30

This abstract introduces OSCAR (Offshore Servicing Coordination Assessment with Remote Rensing), a pioneering service development project aimed at revolutionizing vessel management during the construction and maintenance phases of offshore wind farms. The OSCAR service leverages an innovative integration of terrestrial and space-based data sources, employing Automatic Identification System (AIS), Synthetic Aperture Radar (SAR), and comprehensive weather data to enhance maritime surveillance and planning capabilities.

The methodology encompasses two main elements: (1) Surveillance, for monitoring maritime activity and yaw misalignment within and around wind farm sites; and (2) Planning, which integrates metocean data, weather forecasts, and vessel tracking to optimize vessel deployment. This integrated approach ensures that service and guard vessels are utilized efficiently, enhancing operational safety and productivity.

Preliminary results from the OSCAR project indicate a substantial improvement in situational awareness for maintenance ship operators, facilitated by the advanced processing of AIS, SAR, and meteorological data. This enhancement in operational decision-making tools is expected to drive significant advancements in operational efficiency, safety, and cost-effectiveness for offshore wind farms.

The OSCAR project is an ESA Business Applications Demonstration Project with an expected duration of 24 months. It is spearheaded by a consortium including AAC Clyde Space, the Offshore Renewable Energy Catapult, TRIOS Renewables, and the University of Strathclyde (Institute for Sensors, Signals, and Communications), alongside end users contributing to requirements and solution validation. This collaboration underscores the project's commitment to addressing the specific needs of the offshore renewable energy sector, showcasing a successful partnership between space and non-space stakeholders.

In conclusion, OSCAR exemplifies an end-to-end solution that not only meets the specific requirements of the offshore wind energy sector but also sets a precedent for the integration of space-based data in enhancing maritime operational efficiency and sustainability.