marad tidal

Digital maintenance management for tidal arrays

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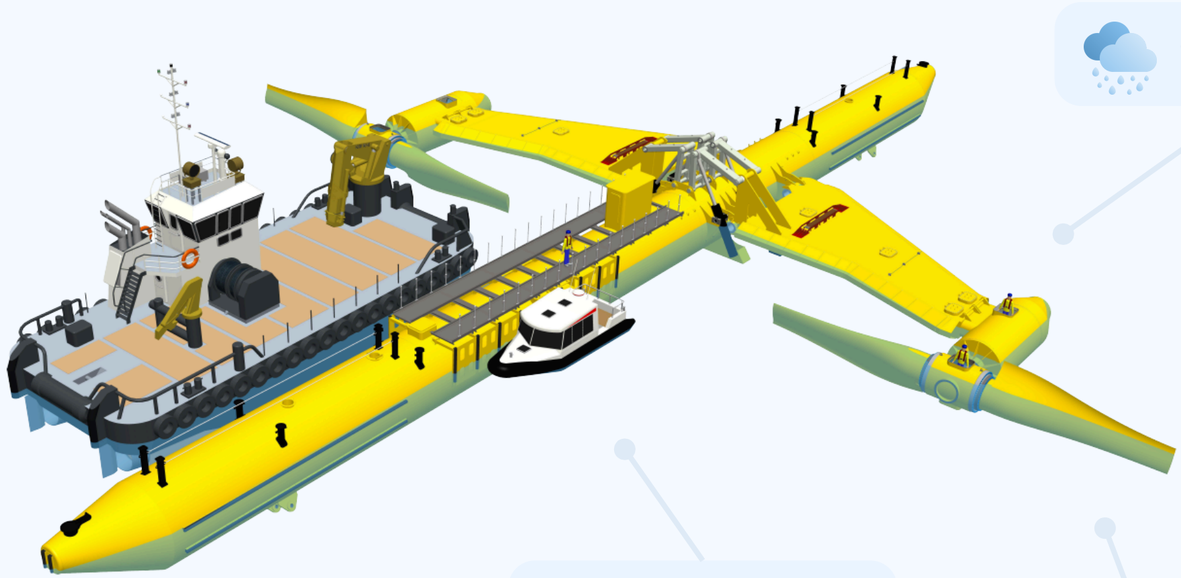
Introduction

Learn how we leverage software and data to identify the most optimal maintenance window for performing maintenance on tidal arrays.



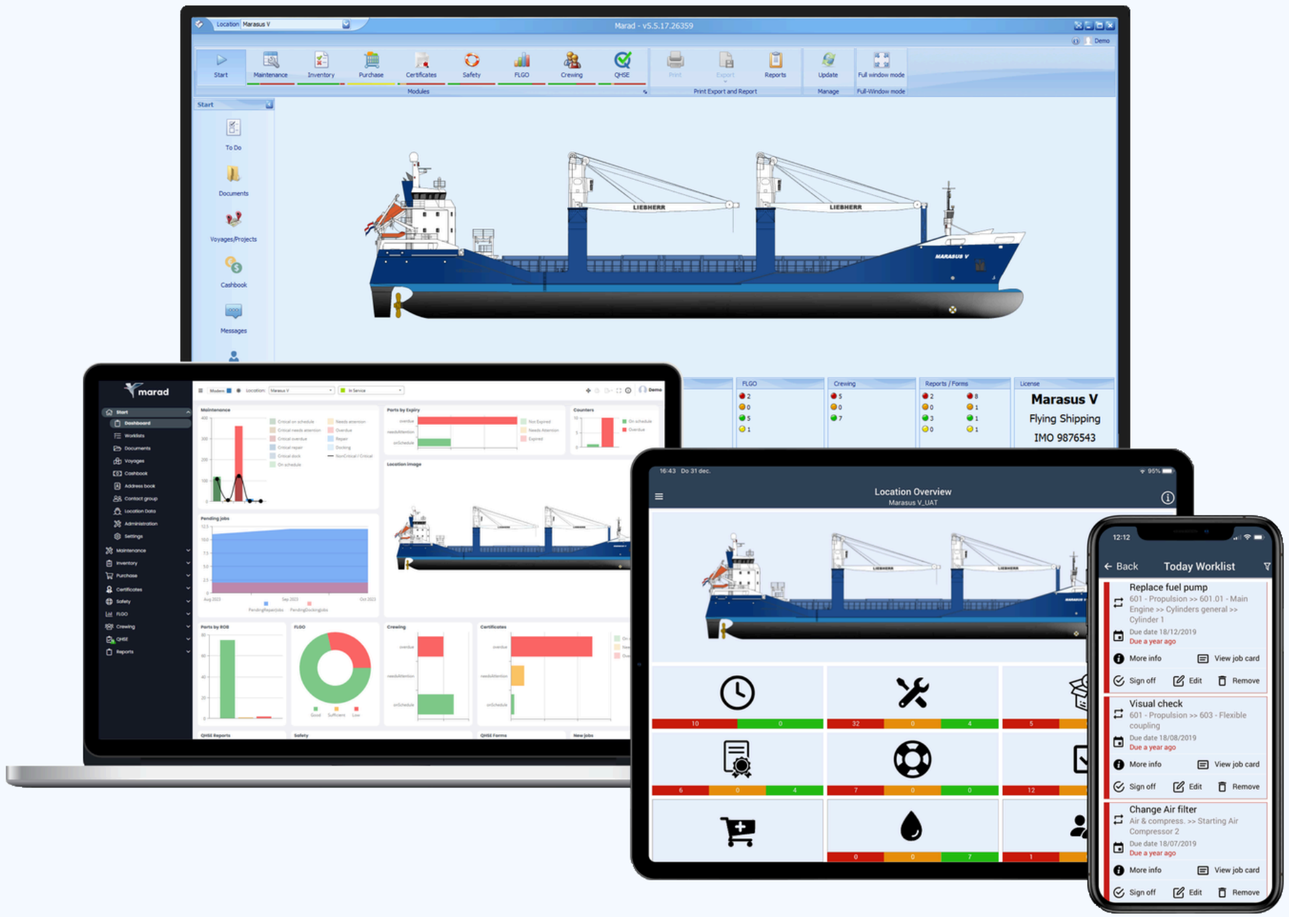
Marad Tidal | About Us

Company

MaraSoft develops Marad, an advanced maritime fleet management application designed for maritime administration. Utilized by over 4,500 vessels and marine installations worldwide, our user-friendly software simplifies operations and administration.

Application

- Start
- Maintenance
- Inventory
- Purchase
- Certificates
- Crewing
- FLGO
- Safety
- QHSE
- Tidal New!

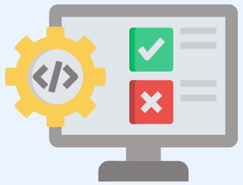


Marad Tidal | Challenges

The tidal energy sector encounters unique challenges in maintaining tidal arrays:

Harsh weather conditions
Operating conditions are challenging and highly unpredictable, affecting reliability and performance.

Short maintenance windows
Environmental constraints and other variables significantly limit the available maintenance windows.

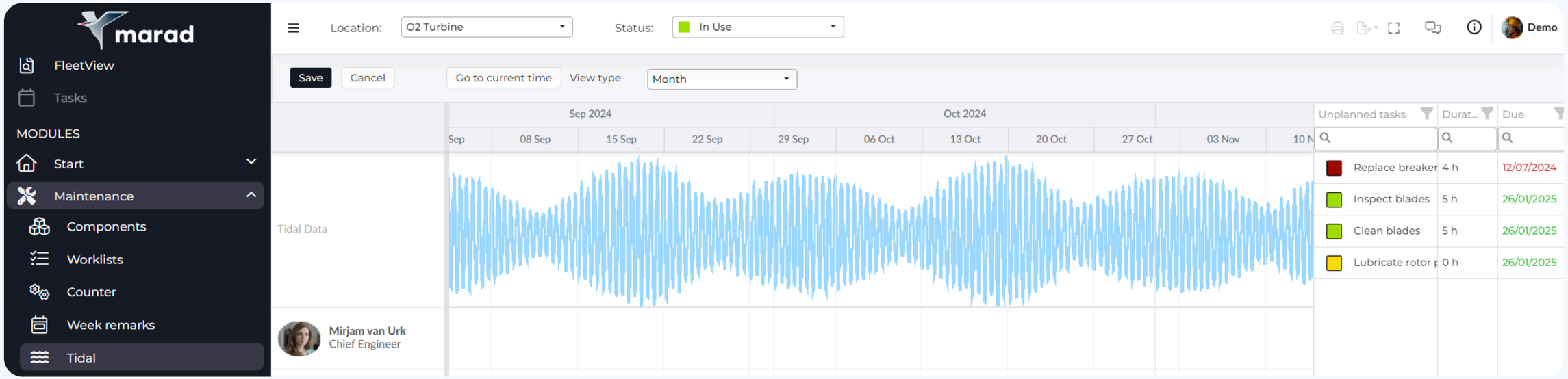


Lack of specialized software
Tidal array projects lack specialized software and maintenance tools, creating operational challenges.

Downtime and financial loss
Inefficiencies or downtime cause significant financial losses by halting energy generation.

Marad Tidal | Solution

Our solution is a tailored maintenance planning tool for tidal arrays.



1) Tidal prediction
Integrated tidal analysis and prediction tool to accurately plan around tidal conditions.

2) Maintenance planning
Complete control over planned and corrective maintenance, ensuring efficiency and minimal downtime.

3) Advanced data analytics
A single platform to easily find the most optimal maintenance window and make informed decisions.

Marad Tidal | Collecting Data

Data Sources

Marad gathers, analyzes, and converts data into actionable insights to identify the optimal maintenance window.

Data Layers

Data layers are used to determine the ideal maintenance window, for example low tidal speeds, a calm sea, and no wind.

Seabed Sensors
Collect tidal data using ADCPs

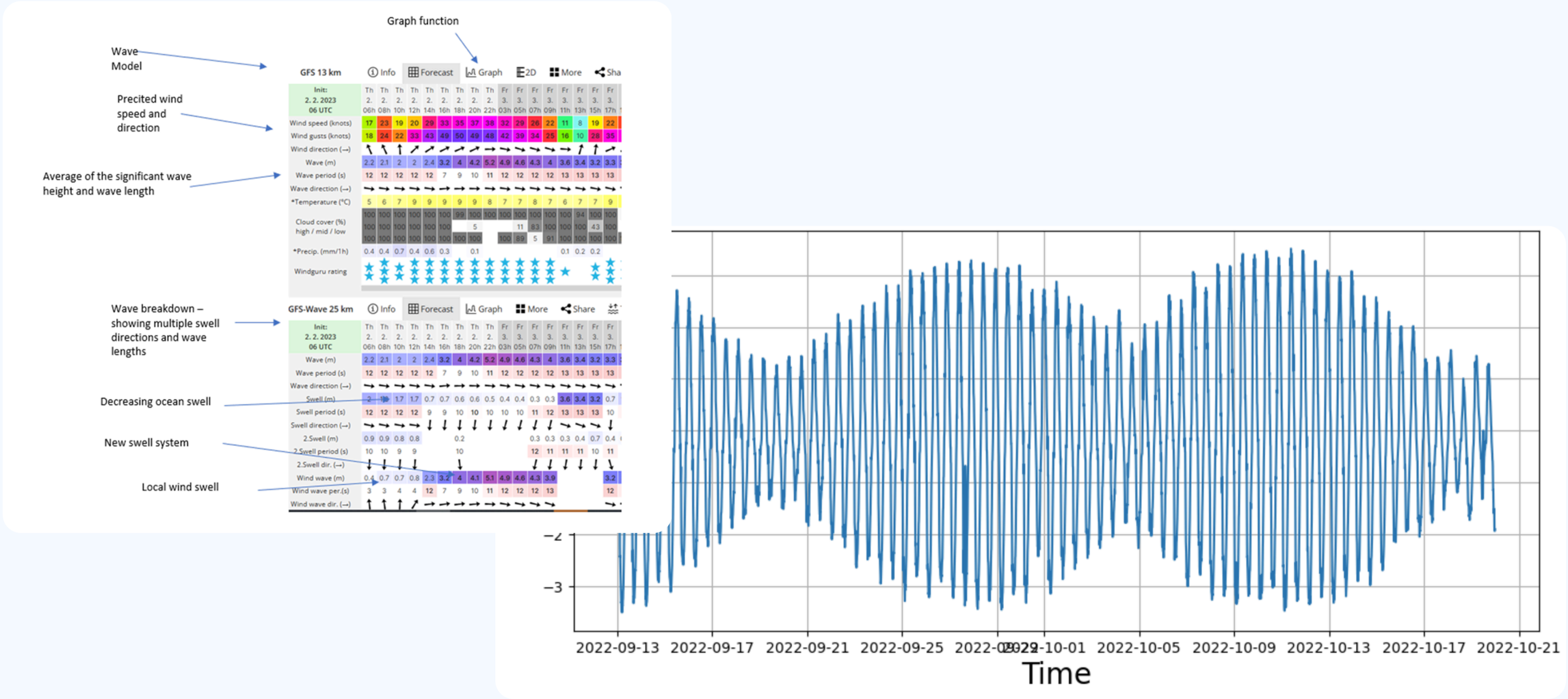
Maintenance
Resource availability and planning.

External APIs
Third-party data such as the weather.

Variables
Predictions, user input, and requirements.

- Tidal speed and direction
- Maintenance tasks
- Weather and waves
- Availability of engineers
- Lost revenue
- Daylight accessibility
- Site entry safety

Marad Tidal | Examples



Marad Tidal | Scope

Summary

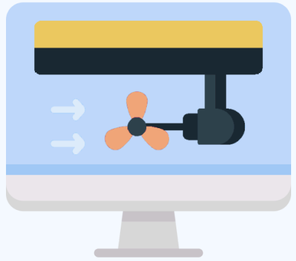
The most significant improvement that will be implemented in Marad is a tidal cycle function and operations planning. In essence, this will allow operators of tidal arrays plan operations ahead based around the state of the tide, weather, andmore. The primary goal is to maximize productivity and efficiency by utilizing favourable conditions, as well as improving the safety of engineers.

Marad

Data Sources

Tidal Module

- Planned and corrective maintenance
- Tidal planning board
- Tidal data layers
- Data analytics



Marad Tidal | Layers

Low Requirements

The ideal maintenance window is calculated using the tidal speed and planning.

Variables

- Tidal speed
- Availability of engineers

Medium Requirements

The window is calculated based on variables such as weather and waves.

Variables

- Tidal speed
- Availability of engineers
- Weather

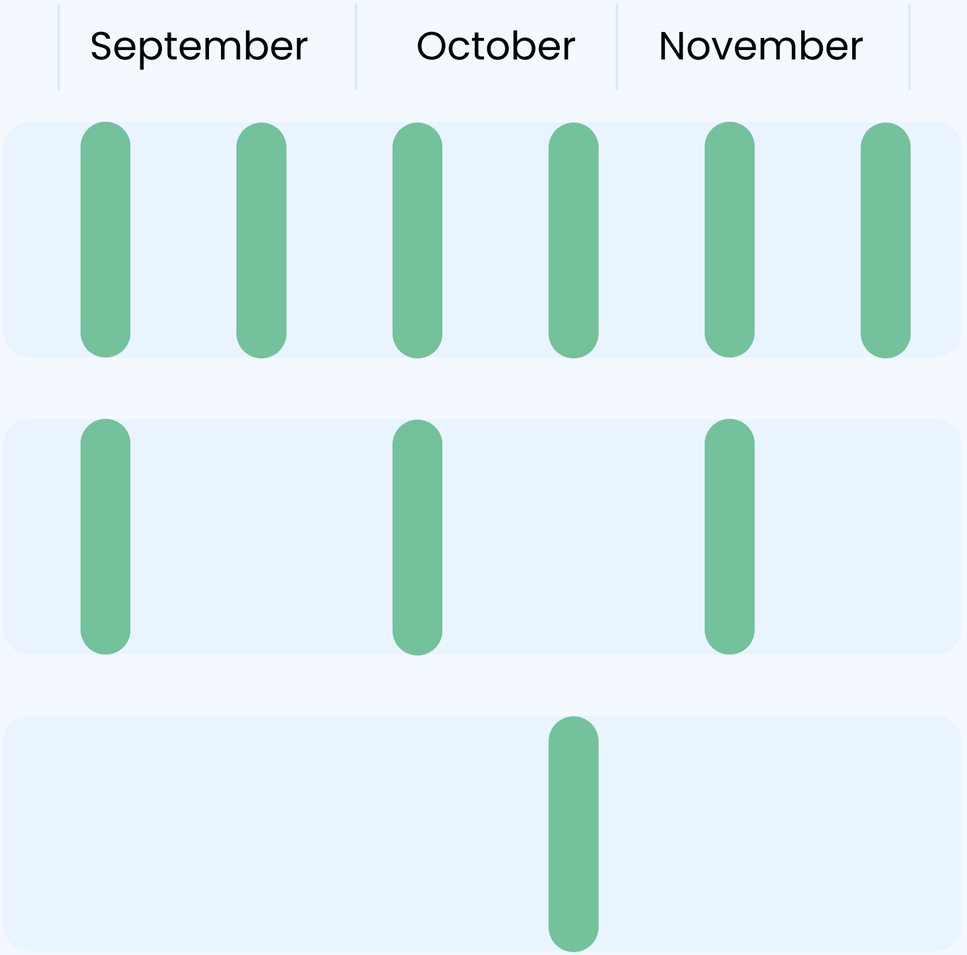
High Requirements

All layers are used and the number of ideal windows is drastically reduced.

Variables

- Tidal speed
- Availability of engineers
- Weather
- Waves
- Daylight hours
- Lost revenue

Marad Tidal | Maintenance Window

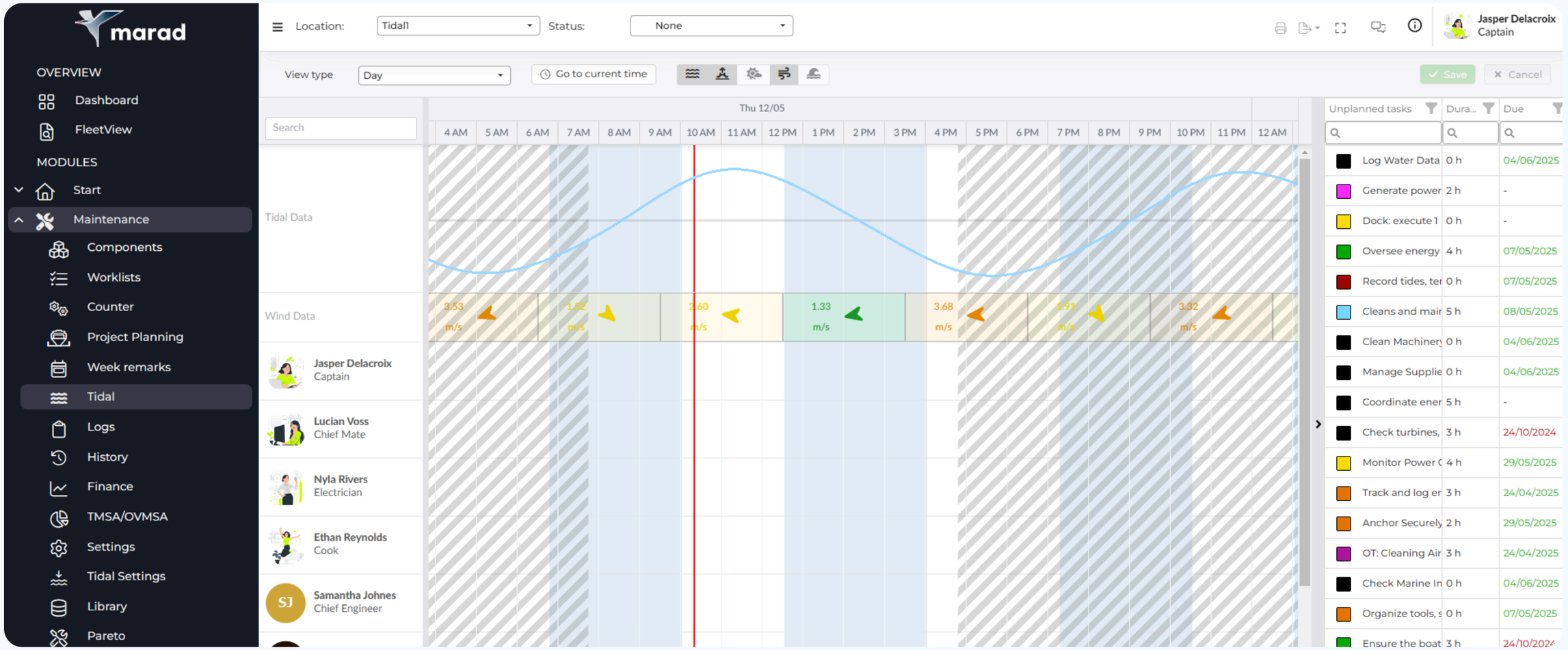


Low Requirements
Due to the low requirements, maintenance can easily be planned at regular intervals.

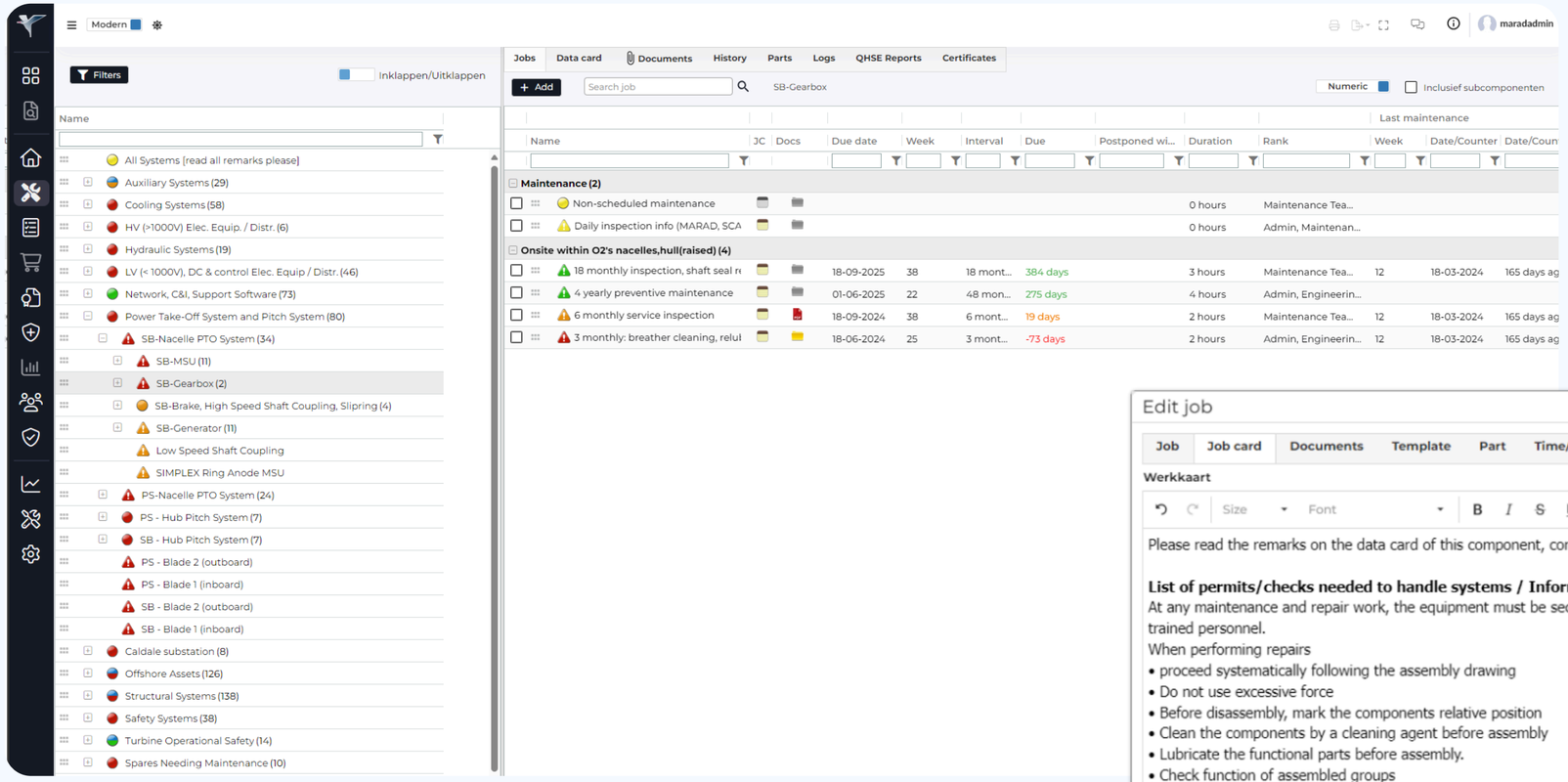
Medium Requirements
Due to the addition of multiple constraints, the number of optimal windows is reduced.

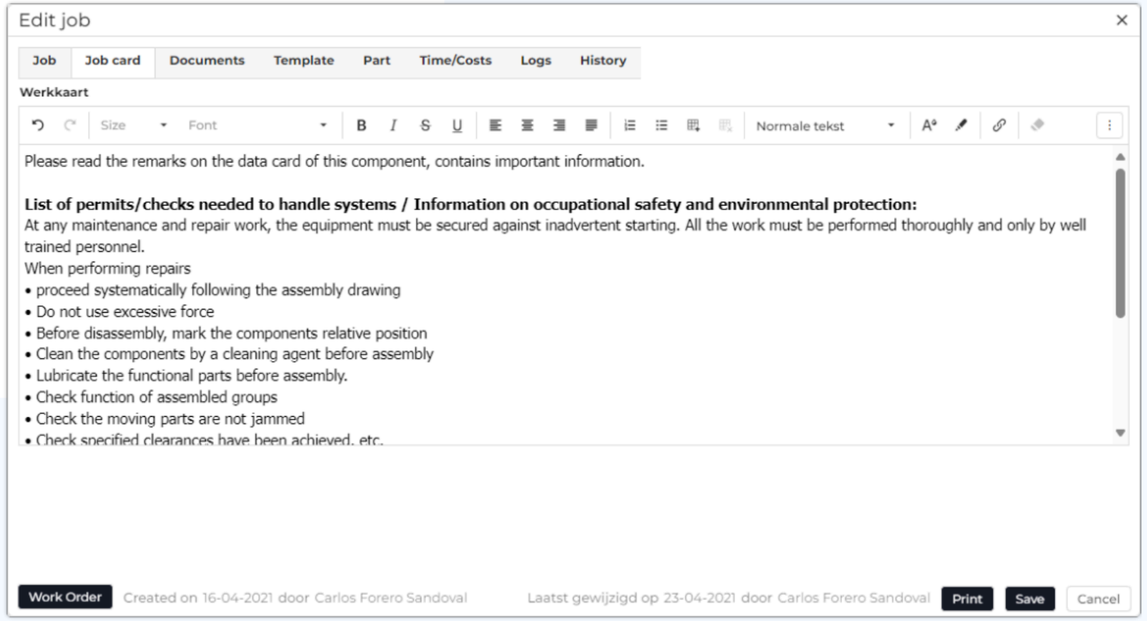
High Requirements
The high number of requirements severely reduces the frequency of maintenance windows.

Marad Tidal | Planning Maintenance Windows

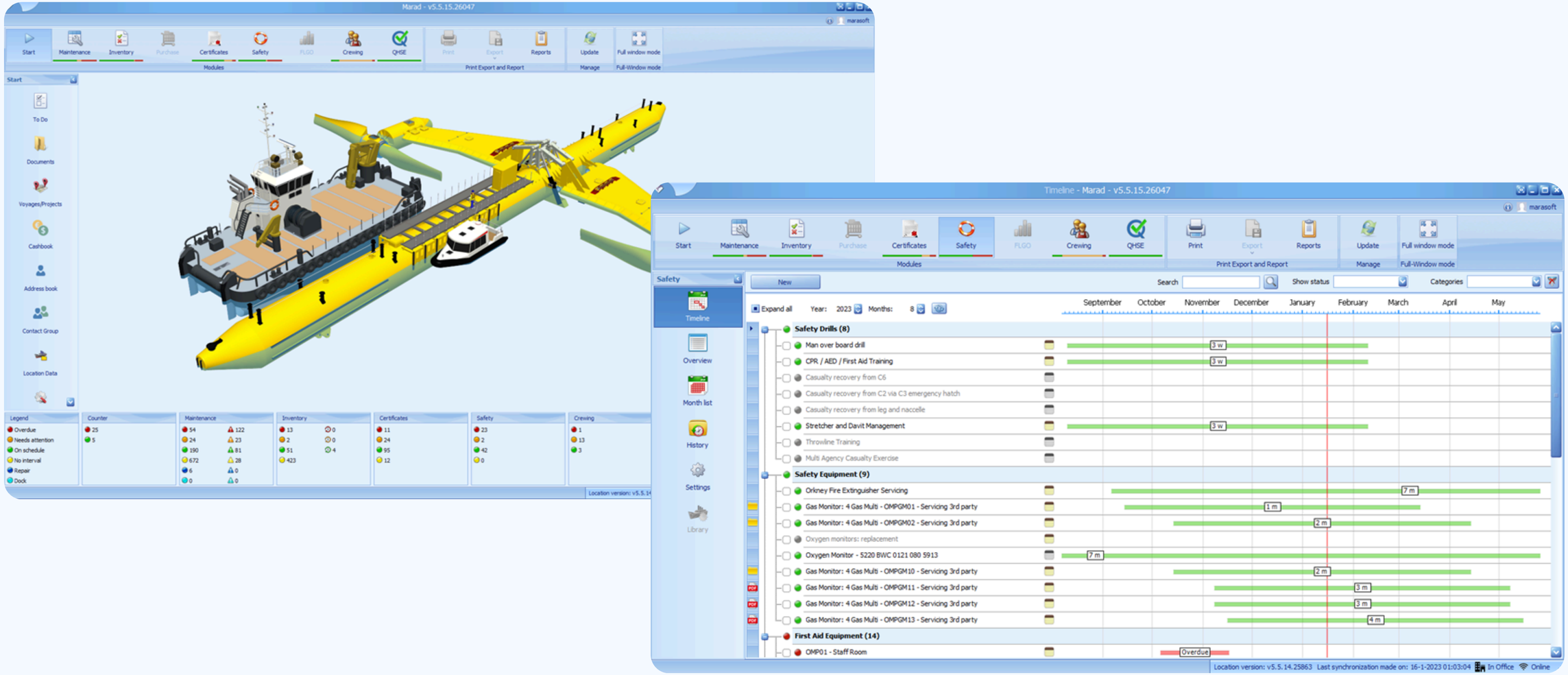


Marad Tidal | Planned Maintenance System





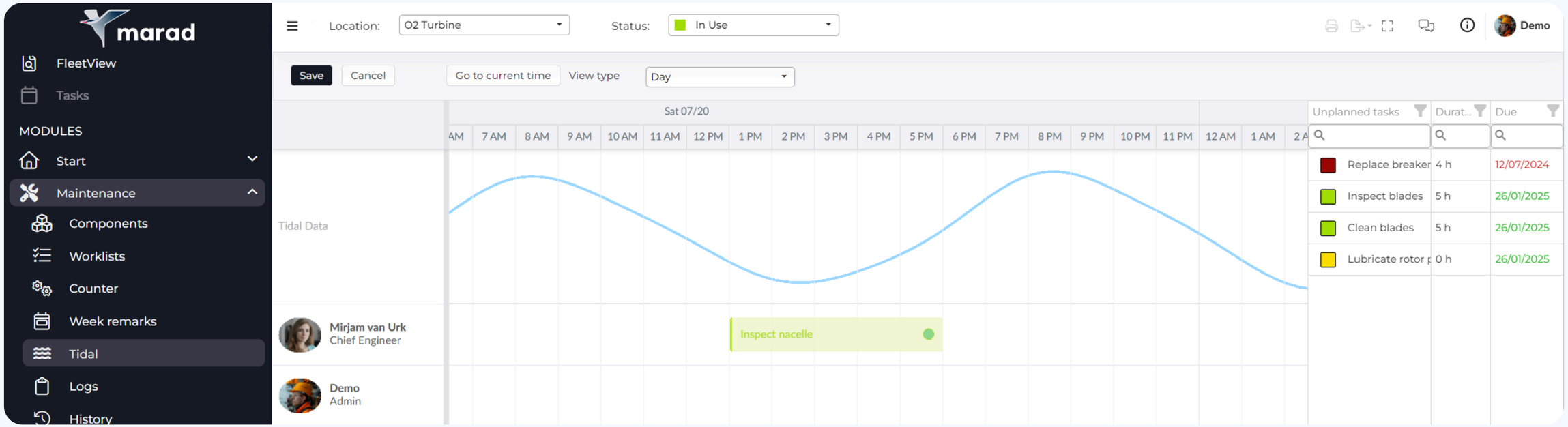
Marad Tidal | Orbital Marine's O2 Turbine



Marad Tidal | Development Status

Progress

The beta version includes features such as tidal cycle visualizers, wind and wave data displays, maintenance task management, engineer availability tracking, and tools for planning and signing off maintenance tasks.



Marad Tidal | Future Improvements

Development

We are approaching the final stages of completing the tasks specified in the 4.1 work package of the MAXBlade project, co-funded by the EU. Any additional items beyond the initial scope will be addressed later.

Backlog

- Display wave data in the planning.
- Create an analysis and report section.
- Integrate a lost revenue calculator.
- Enhance the display of consumable activity.
- Enhance tidal data visualization features.