The Connected Fleet:
How Smart Fleet Management unifies data to unlock performance

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WHITE PAPER

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Foreword

Without the right tools to harness it, the vast amounts of data generated by a maritime fleet can be more of a burden than a benefit to ship owners and operators. Teams are often striving to unify the constant flow of information and turn it into something manageable, meaningful and actionable. But with so many different onboard technologies, often differing from vessel to vessel, let alone by fleet, data consolidation is a major headache. Spinergie's Smart Fleet Management (SFM) solution turns the burden of data into an asset.

At Spinergie, our journey began in one of the most demanding operational environments in the world—the offshore energy sector. From this complex market, we learned how to build scalable, integrated systems that are capable of handling vast amounts of operational and technical data from many diverse sources. This experience has shaped our DNA, giving us a deep appreciation for the technical complexities in unifying fleet data across the maritime landscape.

Today, we use those same principles in our expansion to the shipping sector. We know that no two fleets, or even two vessels, are alike. Our clients operate across a spectrum of vessel types, technologies and operations. That's why we built SFM to adapt, not dictate. It's a hardware-agnostic and integration-ready platform, designed to meet our customers needs and adapt to their existing technologies by connecting seamlessly with third-party software, sensors and workflows.

Scalability and customization are key to our solution. Whether you manage a handful of vessels or a global fleet, SFM evolves with you. From standardized reporting and performance benchmarking to operational and vessel performance, our system grows and adapts to your operations without adding complexity. It is designed to help your onboard and onshore teams make faster, smarter and more confident decisions without getting in their way.

This white paper explores how SFM is helping shipowners bridge the gap between data collection and operational insight. You'll see how our technology has transformed our client's fragmented systems into centralized "control towers" where performance is transparent, reporting is automated and efficiency gains are measurable.

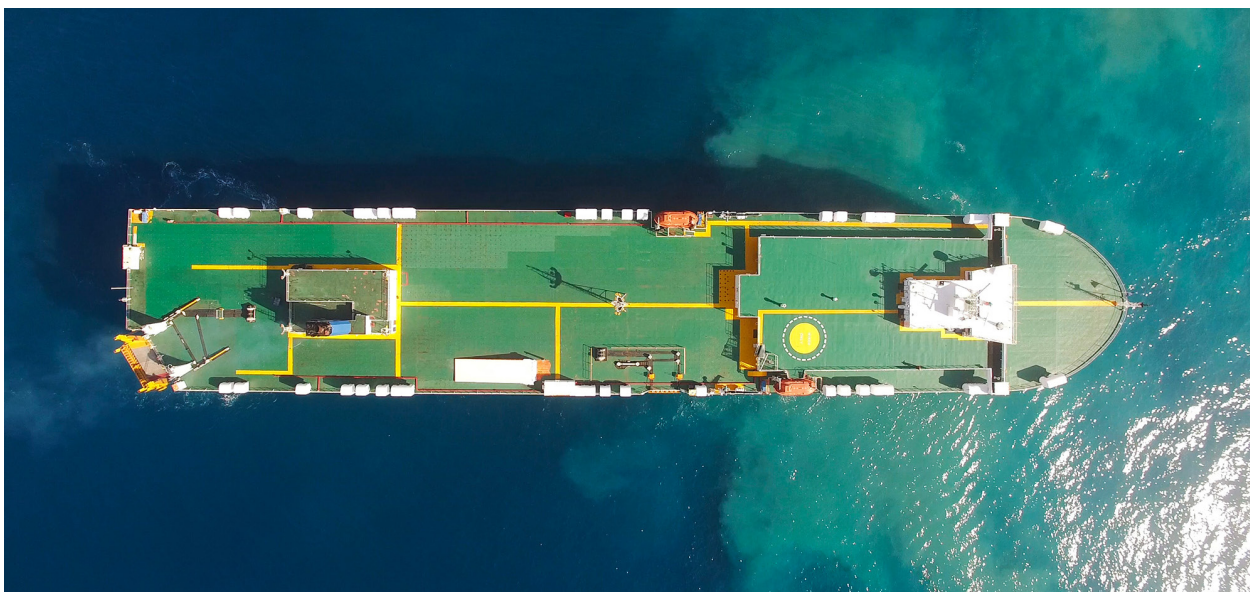**Patrick Sanguily**
General Manager, Americas

Introduction

Maritime operations generate vast volumes of data, yet fragmentation across systems and vessels makes it difficult to generate useful insights. Operations teams often find themselves managing multiple spreadsheets, chasing reports, and reconciling incomplete information—all symptoms of disconnected data.

The challenge intensifies across diverse fleets, where varying vessel types, ages, and onboard technologies create barriers to integration and informed decision-making. Each system may work well on its own, but together they create data silos that make it increasingly difficult to measure performance, benchmark efficiency, or implement consistent fleet standards.

Unifying data is the first step to conquering these challenges. Standardized reporting and effective data consolidation creates a simpler and more reliable system for your onshore and offshore staff. Crews have more time to focus on their core operational tasks while onshore teams have access to accurate, real-time data. Your decision makers are equipped with insights that count, instead of incomplete or outdated reports.

This white paper outlines how our Smart Fleet Management (SFM) solution supports shipowners in consolidating their data sources. Designed to integrate with third-party software, this hardware-agnostic system centralizes your operational and sensor data. It automates much of the reporting process, improves accuracy, and provides clear fleet and vessel performance visibility.

Using real-world examples, this paper shows how SFM is helping our clients address their specific challenges—from reducing reporting time and measuring maintenance impact, to eliminating data duplication and improving operational coordination. By centralizing their data, these companies have moved away from data chaos and isolated information to streamline operational performance on a fleet-wide scale.

Reporting

Standardize reporting to fix the root of the problem

Many shipowners manage diverse fleets using a number of onboard systems and sensors. Most onboard equipment comes with its own software, with this further complicated by the use of different CRMs, PMS systems and crewing software. Naturally, this creates complicated data silos—and silos bring consequences.

> ### The Consequences of Data Silos
> 1. The need to manually update several reports (pre-departure, noon at sea, etc).
> 2. Inaccurate and inconsistent data.
> 3. No single source of truth.
> 4. Impossible to identify inefficiencies or benchmark vessel performance.

A Spinergie shipowner client was struggling with their data compilation and frustrated by the lack of standardization in their reporting. They were ticking all the boxes on a vessel-by-vessel basis but the overall system wasn't working.

The crew were frustrated by entering the same information over and over again for each report. Meanwhile, onshore staff often had to chase missing information that had slipped through the cracks.

Compiling data was a time consuming process that, given the number of spreadsheets and documents involved, was also naturally prone to errors slipping through.

The shipowner knew something had to change. But with a diverse fleet working across multiple sectors, and using a variety of different technologies, software and sensors, they were struggling to see where to begin the process of reporting standardization.

Spinergie's SFM approach was the best fit for their needs. As a hardware agnostic tool, SFM was easy to implement across the fleet as it can be used on any browser. Spinergie's team mapped and integrated all data sources including all third party software for the technologies used across the fleet. This consolidation created one centralized, manageable resource.

SFM's single-entry process for manual reporting, alongside high levels of data automation, cut the crew's reporting time by over 50%. Instead of having to fill multiple reports, the crew can get on with core tasks while SFM processes the vast quantities of daily data into automatically generated and dispatched standard and custom reports (pre-departure, noon at sea, etc).

The onshore team now find their data compilation tasks much easier. They don't have to chase missing reports or data as they are delivered straight to their inbox. They no longer have to spend hours wrestling with complicated spreadsheets as they have customized dashboards packed with the information they need to better understand and manage operations.

SFM Reporting...

- Centralizes all data sources, including third-party software, into one manageable, hardware-agnostic platform, eliminating data silos across the fleet.

- Cuts crew reporting time by up to 90% through a single-entry, highly automated process that frees them to focus on core operational tasks.

- Replaces complex spreadsheets with customized dashboards and automated report delivery, providing clear, actionable insights to better manage operations.

- Allows for accurate KPI tracking in clear, accessible dashboards allowing for cross-team transparency and daily progress analysis.

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Site, Vessel, POI, AIS anten...

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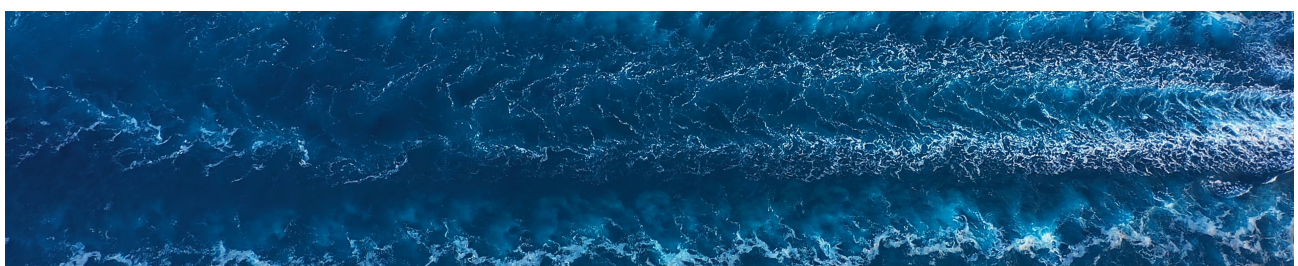| Agent on board - departure clearance* | Agent on board - departure clearance (local time) |
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| Time pilot on board* | Time pilot on board (local time) |
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An illustrated example of a customized, user-friendly Departure Report within Smart Fleet Management.

Consolidation & Centralization

Bringing your data together

SFM's data consolidation and centralization goes beyond standardized reporting. Once the data is processed, it automatically fuels the other modules of the platform: Operations Performance and Vessel Performance. Within these modules are a host of dashboard options which can be selected and customized to suit your business.

- Vessel Performance helps you understand your fuel consumption and measure the impact of upgrades and maintenance.
- Operations Performance acts as your "Digital Control Tower," where all of your fleet monitoring, voyage performance and planning tools are located.

Vessel Performance

Pinpoint vessel efficiency drivers

The Vessel Performance module uses advanced data analysis and sensor data visualization to give users a greater understanding of fuel consumption trends. It also helps you measure the impact of maintenance and upgrades and detect when vessel efficiency begins to degrade.

Ships are equipped with hundreds of sensors, generating a relentless stream of data. But without context, this data is just noise. Sensor visualization contextualizes this data by displaying it alongside operational logs. This allows users to correlate specific events with sensor readings to make more informed decisions about operations and maintenance.

The technical team of one of Spinergie's clients used Vessel Performance tools to better understand their data and answer some of the questions that kept coming up in their day to day operations such as:

- "Why is this ship using more fuel than its sister ship on the exact same route?"

- "What is the impact of weather on my fuel consumption?"

- "What is the breakdown of my consumption during each operation?"

Using sensor visualization, which integrates and contextualizes the data from all their fleet sources, they were able to answer their questions.

For example, to understand the fuel discrepancy, the team used time-series charts to compare the engine load and fuel flow of the two vessels side-by-side. By overlaying this with the vessel activity log

and weather data, a clear pattern emerged: one vessel's engine load spiked dramatically when berthing against the prevailing tide at a specific port. They identified the cause by using the advanced timeline view and scatter plot tools. With this combination they could see that the spike in engine load was down to a difference in how the captains managed the approach. This helped them devise a training opportunity on best practices and resulted in an overall efficiency improvement.

Understand the impact of maintenance and upgrade events

The Performance Over Time (POT) dashboard helps users move from guesswork to a data-driven maintenance strategy. POT has two stages of analysis:

> • A baseline is created to establish the optimal fuel consumption for the ship under ideal conditions across different speeds and drafts.
>
> • Following a hull cleaning (or other maintenance event) the module compares actual fuel consumption with this baseline. By normalizing for all weather and operational variations, POT isolates the exact change in performance that was due to the maintenance event alone.

A Ferry-operator in the Mediterranean knew that hull fouling was a major cause of their fuel inefficiency, but the operations team needed to better understand when to schedule this major maintenance to be most cost effective. A simple before-and-after comparison of fuel consumption could be misleading. For example, a ferry might use less fuel after a hull cleaning in May compared to its performance earlier in the year. But was this due to the cleaning or different operating conditions like calmer seas or slower speeds?

As an example, the client's ship entered a drydock period of approximately 1.5 months for hull cleaning alongside additional modifications including: bulb reprofiling, blade replacement and silicone paint.

Using POT, the three months following the drydock period were observed. This observation showed that there was an average 20% reduction in fuel consumption during transit due to multiple factors: operational choices (speed), weather conditions, and improved technical performance from the maintenance and upgrade programme.

Key Learnings from POT

• By analyzing the speed/consumption curves, a drop from 17.6 to 17 knots was observed in the post-maintenance period. This correlates to a consumption reduction of approximately 6% (from 56.3m3/day to 51.9m3/day).
• Technical performance analysis, which excludes speed and weather impact, showed a 12% improvement in transit due to the maintenance and upgrade programme.

Therefore, POT showed that within the 11.2 mT/day reduction:

• 4.5 mT/day was from speed reduction (~8% reduction).
• 6.7 mT/day was from technical performance improvement (~12% reduction).
• This scenario allowed the operations management team to identify the true impact of maintenance events on consumption. Using this information they were able to justify their maintenance decisions and optimize their planning schedules across the fleet.

With this level of detail the ship owner has a quantifiable ROI on each hull cleaning, independent of weather or other factors. By tracking degradation over time, the operations team could see when hull fouling began to impact performance. This allowed them to move from a rigid time-based schedule to a flexible, condition-based strategy.
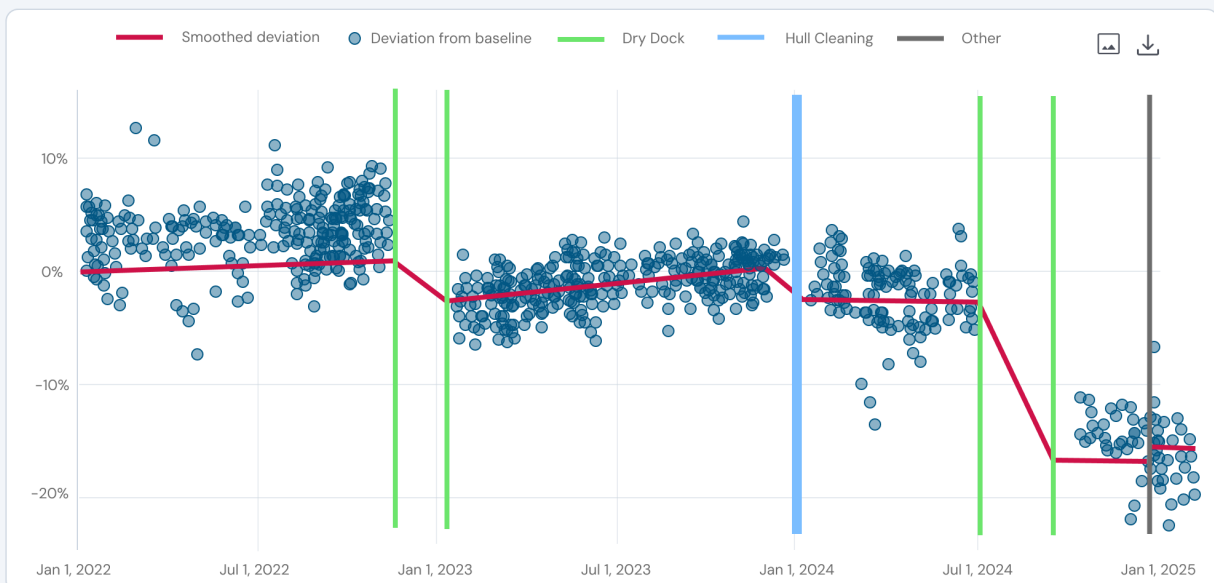
SFM Vessel Performance...

- Identifies the root cause of fuel inefficiency by visualizing sensor data with vessel activity and weather, enabling targeted operational improvements.

- Accurately measures the ROI of maintenance and upgrades by normalizing data to filter out external variables like speed and weather conditions.

- Enables a strategic shift from rigid, time-based schedules to a more cost-effective, condition-based maintenance plan by tracking performance degradation over time

An illustrated example displaying performance changes over time, following key events such as dry docking period and hull cleaning.

Operations Performance

Improve fleet and operational visibility

Operational Performance comprises several key features using the real-time tracking alongside the data that has been standardized through the reporting process:

- Real-time Fleet Monitoring
- Voyage Performance
- Vessel Planning

Real-time fleet monitoring

A client was struggling with day-to-day visibility of their operations. They found that their lack of live data was limiting their ability to make improvements, leading to avoidable waiting times and a lack of coordination between their ships and ports.

Live operations tracking within SFM's layerable map interface gave them the real-time visibility they needed to monitor the fleet. They now have access to live updates of vessel positions, enriched with report and sensor data—without making phone or VHF calls. This gives onshore staff the ability to independently verify if their ships are operating to schedule and arriving on time.

As an extra safety measure, the client has configured a number of alerts, such as exhaust temperature, that lets the relevant stakeholders know immediately when a threshold is breached.

Voyage Performance

Another SFM client found one of their ships was consistently underperforming on a key route. On most voyages it burned more fuel and arrived later than its sister ships on the same route. The Fleet Performance Manager (FPM) turned to SFM's Voyage Performance Reports to uncover the problem. By comparing the underperforming ship with its counterparts across the fleet, the extent of the problem became clear: the ship was burning 6% more fuel for each voyage and arrivals were significantly later.

The next step was a root cause analysis. After analyzing the voyages with historical weather data it became clear that conditions weren't the problem. Instead, that same historical analysis showed that the ship was consistently sailing at higher speeds in the same portion of the voyage—the issue was operational rather than technical.

Using this information, the FPM was able to work with the ship's master to understand that they had been trying to make up for pessimistic weather forecasts without realising how significant the impact would be on fuel consumption. An overcorrection on the second half of the voyage was the cause of the later arrival times.

Using the optimum baseline speeds uncovered in the Voyage Performance Reports from sister ships provided a new plan for future voyages.

Vessel Planning

Centralized vessel planning allows for better coordination, higher vessel utilization, improved forecasting and greater confidence in your strategic decisions. With vessel scheduling part of your performance monitoring workflow, you can avoid misalignment of vessel availability, maintenance and commercial commitments—a misalignment that can bring lost opportunities and unexpected costs.

Spinergie's vessel manager client sought a solution that would help their various teams align their vessel planning needs. They had previously undertaken commercial planning tasks by manually updating separate vessel spreadsheets with data from their CRM platform and other sources. But this manual process siloed their data. It was error-prone, time-consuming and lacked cross-team functionality.
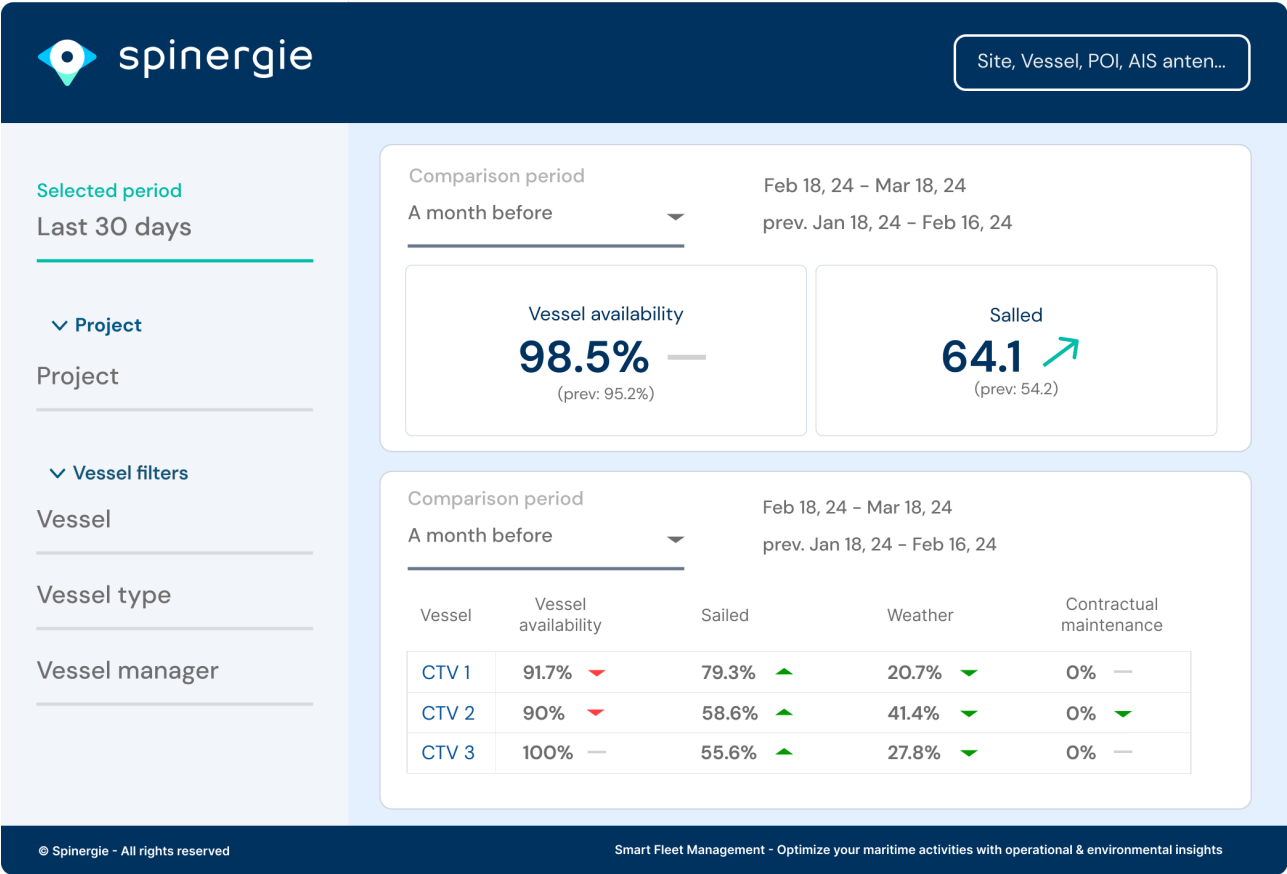
With these old, complicated processes....

> ⊗ Planning managers were burdened with a heavily manual process with a high risk of human error.
>
> ⊗ Project managers couldn't easily assess and mitigate scheduling impacts from project delays.
>
> ⊗ Sales teams lacked real-time visibility into vessel availability for client planning.
>
> ⊗ Sales leadership had no centralized view of fleet utilization, limiting revenue forecasting.

By choosing to incorporate Spinergie's Vessel Planning module into their fleet management workflow, the client centralized their planning data. This eliminated the need for multiple spreadsheets and aligned all teams around a live, shared view of their fleet.

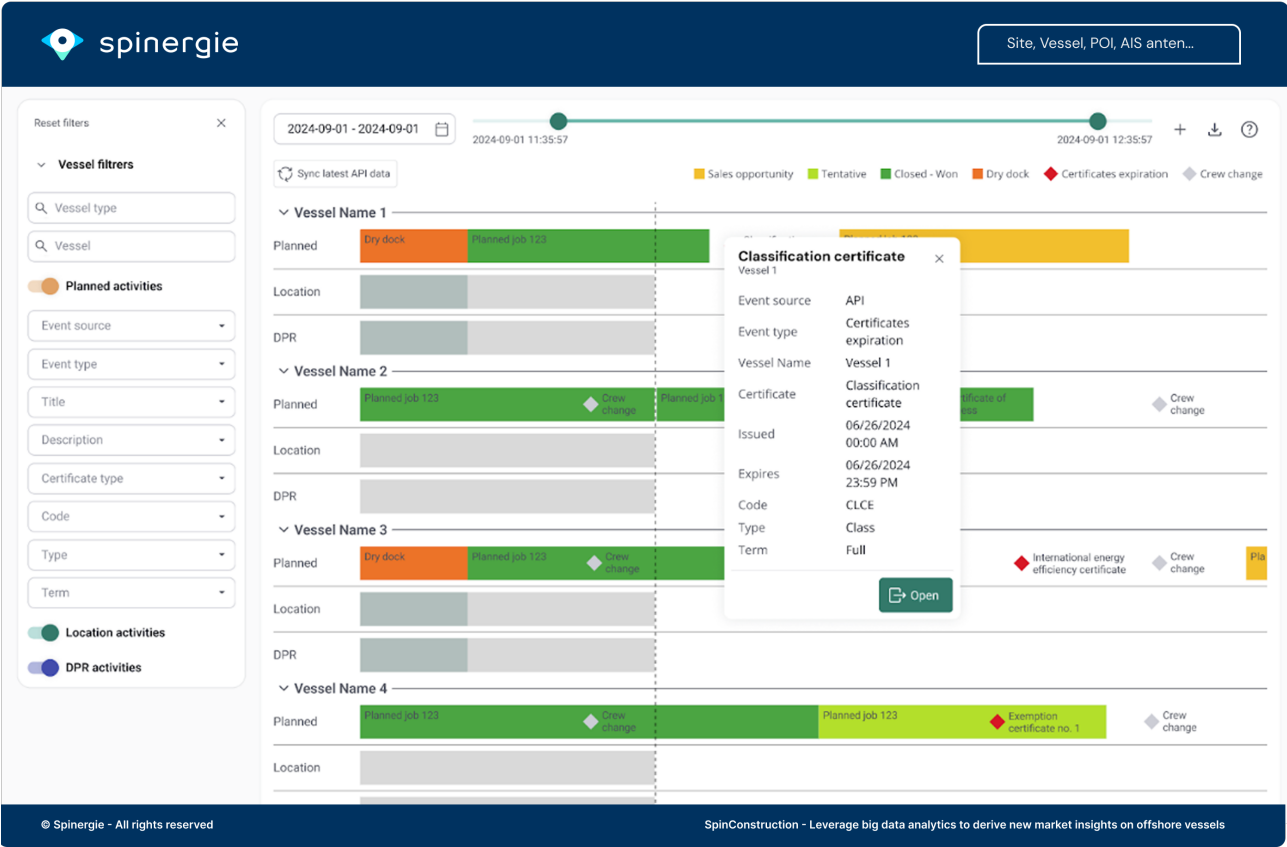With the new efficient Vessel Planning process...

> ⊘ Planning managers receive automatically updated schedules with a consolidated view across the fleet.
>
> ⊘ Project managers reschedule with full visibility of potential business impact.
>
> ⊘ Sales teams see real-time availability enabling collaborative client planning.
>
> ⊘ Sales leadership gains instant insight into utilization and revenue potential.

The client now has the ability to maximize fleet utilization with more precise planning decisions.

Above: An illustrated example of an Operations Performance dashboard highlighting vessel–by–vessel comparison.

Below: The dynamic Vessel Planning interface.

SFM Operations Performance...

- Provides real-time monitoring for schedule verification and delivers immediate safety and equipment alerts.

- Continuously tracks progress with automatic Voyage Performance Reports, to give your team real-time visibility into fuel use, speed, and schedule adherence.

- Centralizes all your fleet planning activities to align your teams with every decision and maximize commercial performance.

Conclusion

For many shipowners the problem isn't a lack of data, it's that the data is scattered across multiple sources and software. A centralized platform cuts through the noise and places all of your critical operational data in one place.

This ultimately allows your team to shift from a reactive to a proactive mindset. A "digital control tower" gives you the vision to see what's coming, rather than just reacting to delays or engine trouble after the fact.

The pressure for efficiency and sustainability will only increase in the maritime sector. Having a single source of truth for your fleet, with analytics that help you make effective operational improvements, is the key to staying competitive and building a stronger, smarter future.

About Spinergie

Through our varied experiences and knowledge, we have become experts in applying data science to the maritime sector. We are based in the US, France, the UK and Asia. Our solutions are used by charterers, shipowners, and engineering companies all over the world.

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