SAGA

One Performance Concept for all Vessels

On board

AutoLog
Real-time Decision Support

VslLog
Noon & Event Reporting

On board server
with database containing vessel data, model etc.

Fuel Consumption System
Presents past, present and accumulated consumption based on flow meter measurements for which error, alarm and warning log is included to ensure the system integrity and reliability. The system also provides you with immediate cause and effect feedback.

Performance Monitoring System
Utilizes a variety of sensor inputs to help you make real-time decisions and improve your vessels performance on speed, consumption, power, steam, charter party and behavior, through customized KPI calculation and visualization.

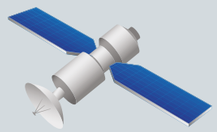
On board server
Vessel specific server that handles all data exchange between ship and shore.

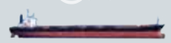
Digital Logbooks
Consists of several digital logbooks among others:

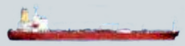
EvntLog: gives you the most comprehensive and flexible platform for logging events, such as sea passage, mooring, anchoring, manuevering, speed instruction etc.

MetrLog: digitally log as many or few parameters as you like, such as speed, consumption, bunkering, draft, weather etc.

DataLink




Bulk


Tanker

Cruise

...and many more.

DataLink
Linking vessels to shore operations, ensuring both sides have access to the same data. Intelligent connection monitoring and minimized data transfers with zero loss.

On shore

FleetViewer
Data Visualizations

External Data
3rd Party Data

On shore server
with data from entire fleet connected to the system.

FleetViewer
Dashboards combine data from VslLog, AutoLog and External Data to visualize everything in one tool to capitalize on the synergy that this enables.

Journey through your data to discover its true potential, formulate the KPI's of tomorrow and immediately implement them in your dashboard, on your own or in collaboration with Insatech.

On shore server
Customer specific server that handles all data exchange between the fleet, Insatech and 3rd parties.

External Data
Hind cast integrates data from a weather service provider with the system for improved performance normalization and charter party compliance analysis.

Hull performance via an API that sends data to an external engine and get the results back into the system for seamless integration.

Other data can be added, such as bathymetry, ECA areas, country areas, port areas, etc.

SAGA AutoLog

***SAGA Fuel Consumption System** is the first step in knowing what your performance is right now.*

The Fuel Consumption System (FCoS) consists of several sturdy, reliable and accurate Coriolis mass flow meters and an operator panel that gives you real-time information about consumption and can alert you about possible issues with the flow measurement, such as leakages.

Increase Crew Awareness and Save Fuel
The real-time fuel consumption measurement can help increase crew awareness, for example, if you place the operator panel on the bridge, it will give the duty Officer immediate feedback about the fuel consumption when he makes changes to the vessel's speed and trim or even changes in weather conditions. This will continuously increase the crew's awareness about how operational changes affects the fuel consumption and can help them save fuel.

We Recommend Coriolis Mass Flow Meters
The Fuel Consumption System works by installing one or several flow meters, depending on how granular you want your measurement. The system can utilise your current flow meters, but we usually recommend installing Coriolis mass flow meters, at least on main consumers, because it gives you certain advantages.

The two most obvious advantages are the accuracy and that the flow meters measure mass directly. Volume based flow meters need additional temperature measurements and conversion tables to calculate mass, which increases the uncertainty of the measurement.

Another advantage of the Coriolis mass flow meter is that it can give you additional information about its operational status such as air bubbles in the fuel, when it was last zero-point adjusted and unexpected flow, just to name a few.

Accuracy Is Important
The accuracy is important, especially if you measure the fuel consumption as a partial flow, of a larger circulated flow, because this greatly amplifies the inaccuracy of the flow meter. The circulated flow can be as much as 50 times greater than the consumption, amplifying the inaccuracy 50-fold. If the circulated flow is 5,000 kg/h and the consumption is 100 kg/h then an accuracy of 1% corresponds to ±50 kg/h. Since the circulated flow is measured as the difference between inlet and outlet, you need two flow meters, and if you are lucky, they cancel each other out, but in the worst case, they amplify each other resulting in an inaccuracy of ±100 kg/h on a consumption of 100 kg/h.

Detect Leakages
Depending on your setup, you can detect leakages in your system by cross referencing flow from several flow meters in your circulation loop, for example a leaky bypass or pressure relief valve.

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SAGA AutoLog *(FCoS continued)*

Main Engine Consumption

The display of the main engine overview provides a total view of the main engine's fuel consumption. A consumption trend line shows an accumulation of the most recent data. The setup is dependent on the number of installed meters.

Service Parameters

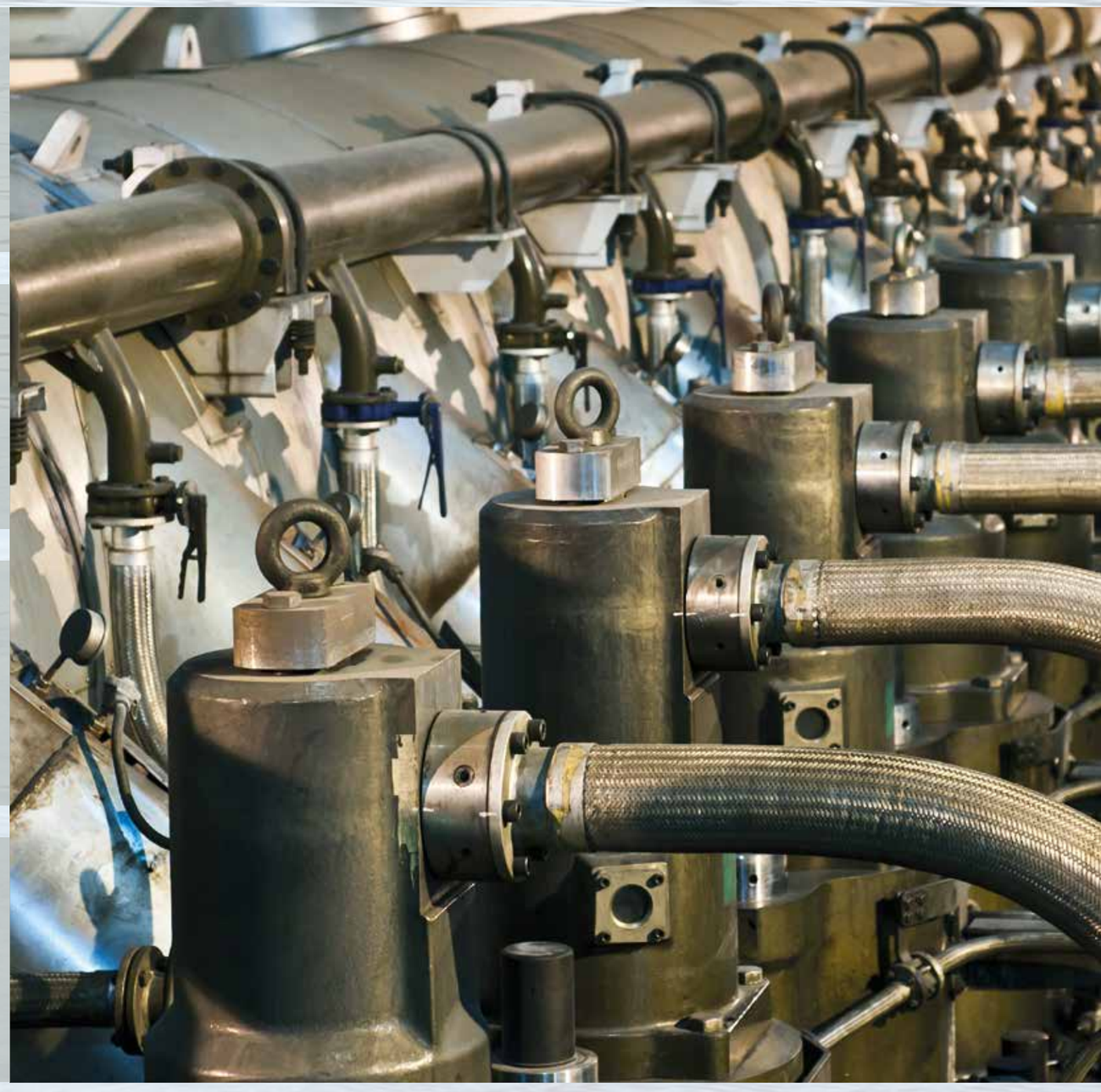
The service parameters displays raw data for each flow meter related to consumers. It shows the main menu data and provides a manual totalizer. From here the alarm status screens are set up. Furthermore the green light shows that the communication between flow meter and system is intact.

Generator Engine Consumption

From the Aux engine screen, you get an overview of all your auxiliary engines' consumption. As with the main engine overview, this also provides an easy to read display of consumptions, trends and engine loads.

Detailed View

If you want a more detailed view, simply select an engine from the overview screen. From here it is possible to get the actual and total consumption of the given engine, as well as values for engine inlet and outlet such as mass flow, volume, density, temperature and total mass.



SAGA AutoLog

*SAGA **Performance Management System** gives you the flexibility to collect data from any source and makes it possible to implement ship wide performance improvements.*

The second step of getting to know your performance is the Performance Management System (PMoS), which builds upon the FCoS platform and gives you the flexibility to collect data from any sensor on board. PMoS includes an expanded operator panel, that allows you to specify and calculate any Key Performance Indicator (KPI) imaginable. If you are missing data points for your KPI's we can help you collect that data by installing new sensors.

The KPI's you create, can help your crew improve the operation of the ship and help you save money by optimizing performance. The system contains a lot of valuable KPI's, and we are always ready to help you create new KPI's that support your business.

Compare Charter Party Terms with Actual Performance
By using the PMoS you can compare contractual charter party speed, consumption and weather clause with the current or overall voyage performance. This can help your crew keep within the charter party conditions. You can also see the accumulated consumption in- and outside the weather clause. When your vessels perform better your charterers can save money on consumption and you can earn money by increasing charter rates.

Increase the Flexibility of Your Current Data
The system can also give you more flexibility than your current systems. For example, your engine control system might measure exhaust gas temperatures across cylinders or banks of cylinders to ensure, they do not deviate too far from the average. But it might not be possible to monitor any other KPI's than the ones that are available. With the PMoS you can gather the sensor data and use it to make your own KPI's or set your own warning and alarm thresholds without the need to involve any third party. This gives you the power to create even better insight into your performance.

Shut It Down and Save Money
PMoS can also help create awareness about how the base load of the vessel impacts expenses. This can be done by showing how much it costs to run machinery and how much can be saved by shutting it down. This can be done calculating the price of running the machinery using the current consumption and the price of the fuel, which will make it easier for the crew to see, how running the machinery affects the costs.

Collect and Validate
The system is built by collecting data from available instrumentation, manual logs, meta and third-party data. The increase of signals makes it possible to cross reference data to identify faulty and inaccurate sensors. This is done to validate the dataset and make sure the KPI's are correct before you start drawing conclusions from it.

Typically, data comes from:

- Shaft power meter
- kWh counters on production and consumption
- GNSS signals
- Speed log
- Echo sounder
- Anemometer
- Gyro and gyro compass

Data can also include motion sensors and draught sensors, as well as any signal that goes into the engine control system, including alarm logs etc.

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SAGA AutoLog *(PMoS continued)*

Power Production

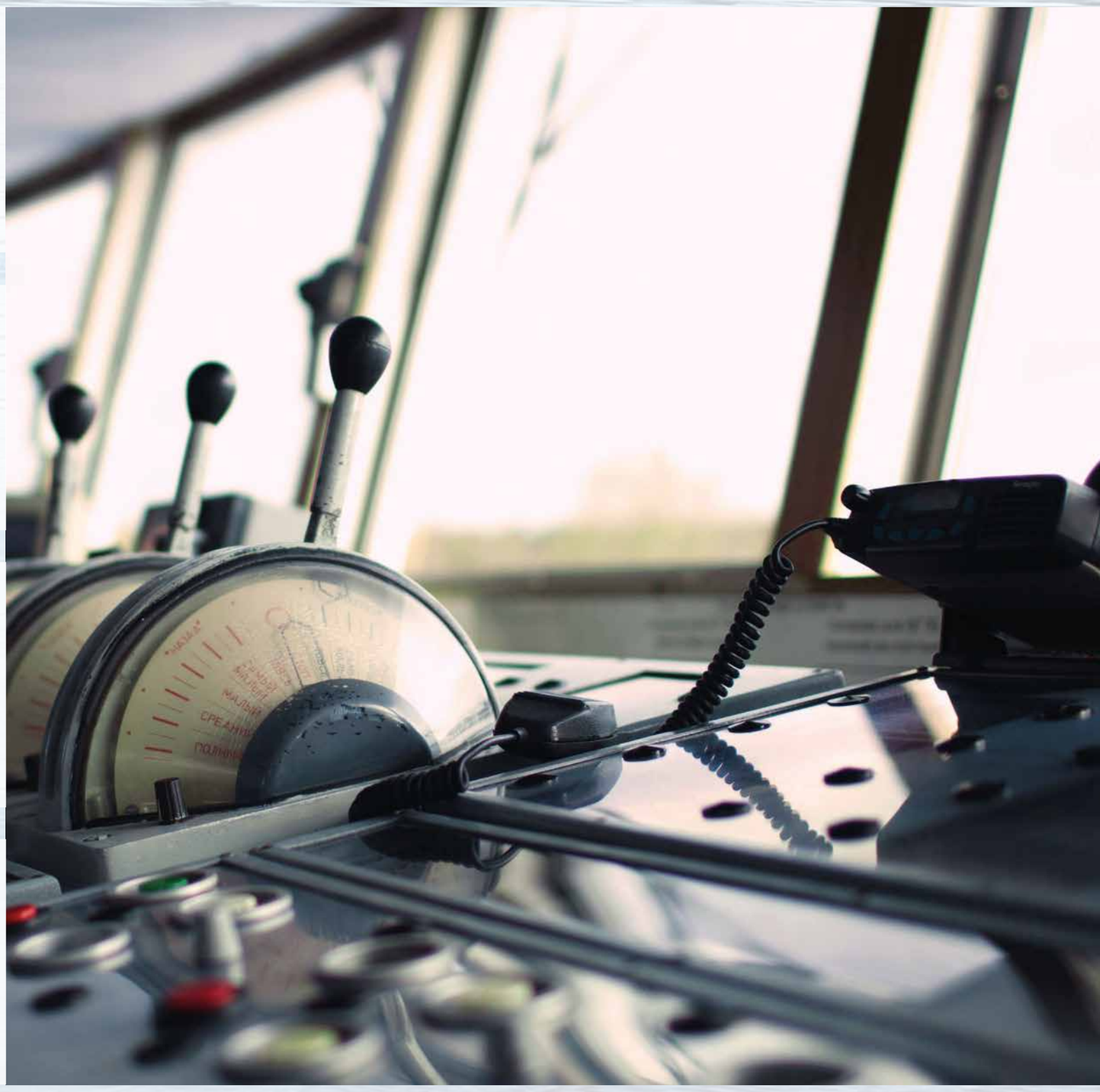
Discover how much time you spend running generator engines parallel on low load, costing you fuel and wasting running hours that impacts maintenance costs. Set up KPI's for low load parallel running, and configure the thresholds for target, minimum and maximum load for each vessel individually, sister vessel groups or fleet wide. See your historical performance and compare it to your current.

Trim and List

Monitor your dynamic trim in real-time and compare it with your trim table to highlight any savings potential from changing your trim. Enable the crew to detect even minor angles of list, even when the vessel is rolling, to allow them to right the vessel and save fuel. Get an objective insight into how much the bow is pitching and how much the vessel is actually rolling, with indicators for maximum and average angels as well as angular velocity.

Boilers

Optimize your boiler operation by ensuring that the boiler is not starting and stopping unnecessarily often. Adjust steam pressure set points to reflect your current operational condition. Set up triggers to alert you to undesired running patterns.

Propulsion

Under sea passage conditions, your combinator curve may not offer the optimum pitch settings at the given speed. Improve your propeller performance by optimizing your propeller pitch. Benefit from constant power speed instruction, by adjusting your engine speed to changing external conditions to run at constant power. Ensure that you are running on or below your nominal propeller load index, to avoid heavy run on the propeller, stressing the engine and lowering performance.