NOON REPORT TO REAL TIME MONITORING

Digitalisation without experience is data without direction

Chief Eng. Omur Karatas

From hands-on engineering to digital innovation — 47 years of experience powering smarter ships

Founder of ORTECH MARINE A.S

Founder and President of the Turkish Ship Repair Association (GOSDER)

Our philosophy

🔧🌍💧 **Less repair, fewer spares – smarter maintenance.**
Lower emissions, silent seas – more sailing.
Less waste, better cooling – maximum efficiency.

Sail smarter. Stay ahead.

I am a **Chief Engineer** with **47 years of experience**, leading **Ortech Marine** for the past **10 years**, driving sustainable and innovative **green solutions**.

We specialize in **scrubber filtration, ballast water treatment, and sterntube leakage prevention**. Our expertise extends to **antifouling systems, real-time monitoring, hybrid power solutions, remote automation control, and gearbox, main, and auxiliary engine repair and maintenance**.

Where Digital Tools Drive Change — and Where They Hit Rough Seas in Shipping Decarbonization

Technology supports experience — it doesn’t replace it

Introduction of Digitalisation

- Global shipping = ~3% of global CO_2 emissions
- IMO target: Net zero emissions by 2050
- Digitalisation plays a key role in monitoring, optimizing, and accelerating decarbonisation
- But digital tools bring both major benefits and new challenges

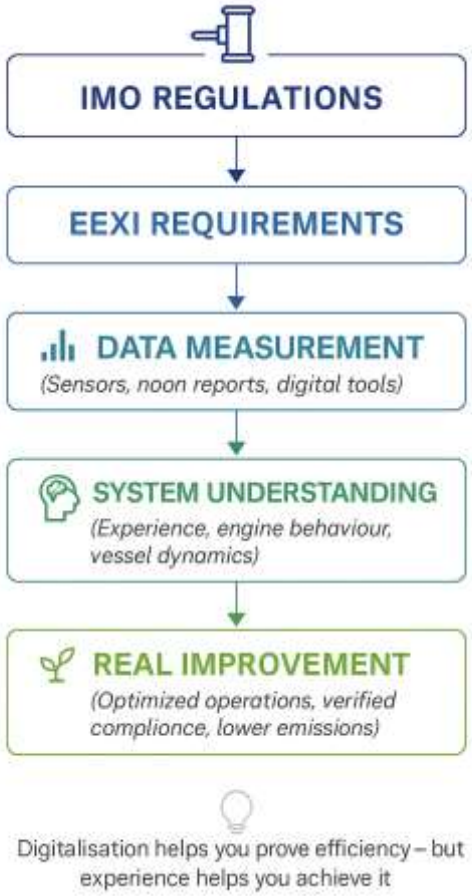
Decarbonization: A Maritime Priority

Maritime stakeholders recognize **decarbonization** as a critical priority, driven by increasing regulatory pressures and industry initiatives like the **Sea Cargo Charter**. Compliance with frameworks such as **IMO 2030, EU ETS, EEXI, and CII** is essential.

But how can you integrate **emission considerations** into voyage planning while ensuring operational efficiency?

“Compliance comes from control — and control starts with understanding.”

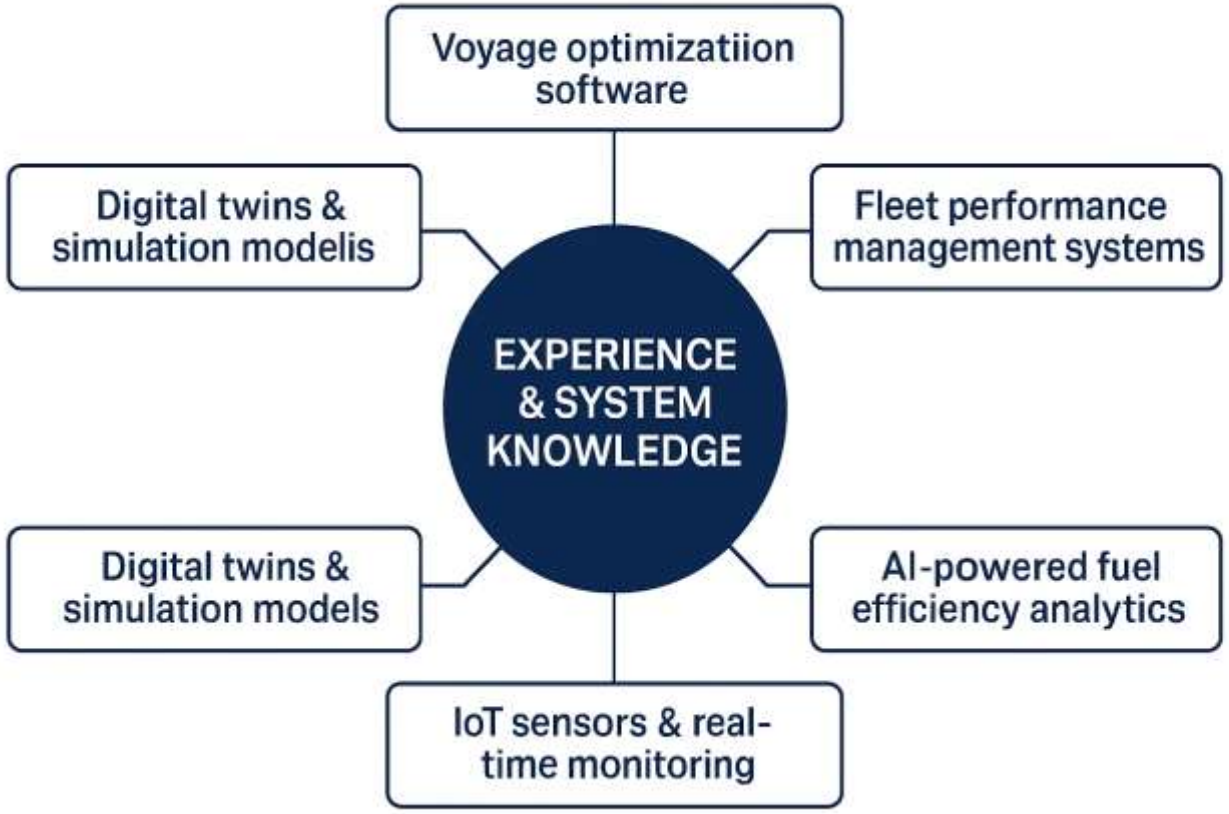
Energy Efficiency Existing Ship Index – EEXI



The **EEXI**, introduced by the **IMO**, measures a ship's **technical energy efficiency** to reduce emissions.

- Applies to **ships ≥400 GT** on international voyages (**Regulation 23**).
- **One-time approval** required, no later than the first periodical survey in **2023**.
- Must be calculated before the **first air pollution prevention or energy efficiency certification survey** (**MARPOL Annex VI**)

Key Digital Tools in Shipping



Where Digital Tools Achieve the Most

Area	Key Digital Tool	Impact	Experience Role
Fuel Efficiency	Voyage Optimization	5–10% fuel savings	Accurate performance interpretation
Maintenance	Predictive Monitoring	Reduced downtime	Recognising early signs
Emission Tracking	MRV/DCS/ETS Tools	Compliance & reporting	Validating real data
Innovation	Digital Twins	Safer testing	Model realism from experience

Data achieves results when experience gives it meaning

Where Digital Tools Cause Challenges

Challenge	Description
Data Fragmentation	Different systems, formats, and no unified platform
Cybersecurity Risks	Every connected device adds exposure points
High Implementation Cost	Implementation and training barriers for smaller operators
Lack of Digital Skills	Crews and engineers need training to use new tools effectively
Regulatory Uncertainty	Standards for digital data acceptance still evolving

Digitalisation succeeds when we standardise, secure, and skill-up—not just connect every-thing.

Real Time Monitoring System

Vessel systems

- Mass flow meters
- Omurai 17" touch panels
- Engine & exhaust sensors
- DG load, fuel, emissions, and navigation data

Onboard server / secure cloud

- Data processing & validation
- AI-assisted analytics

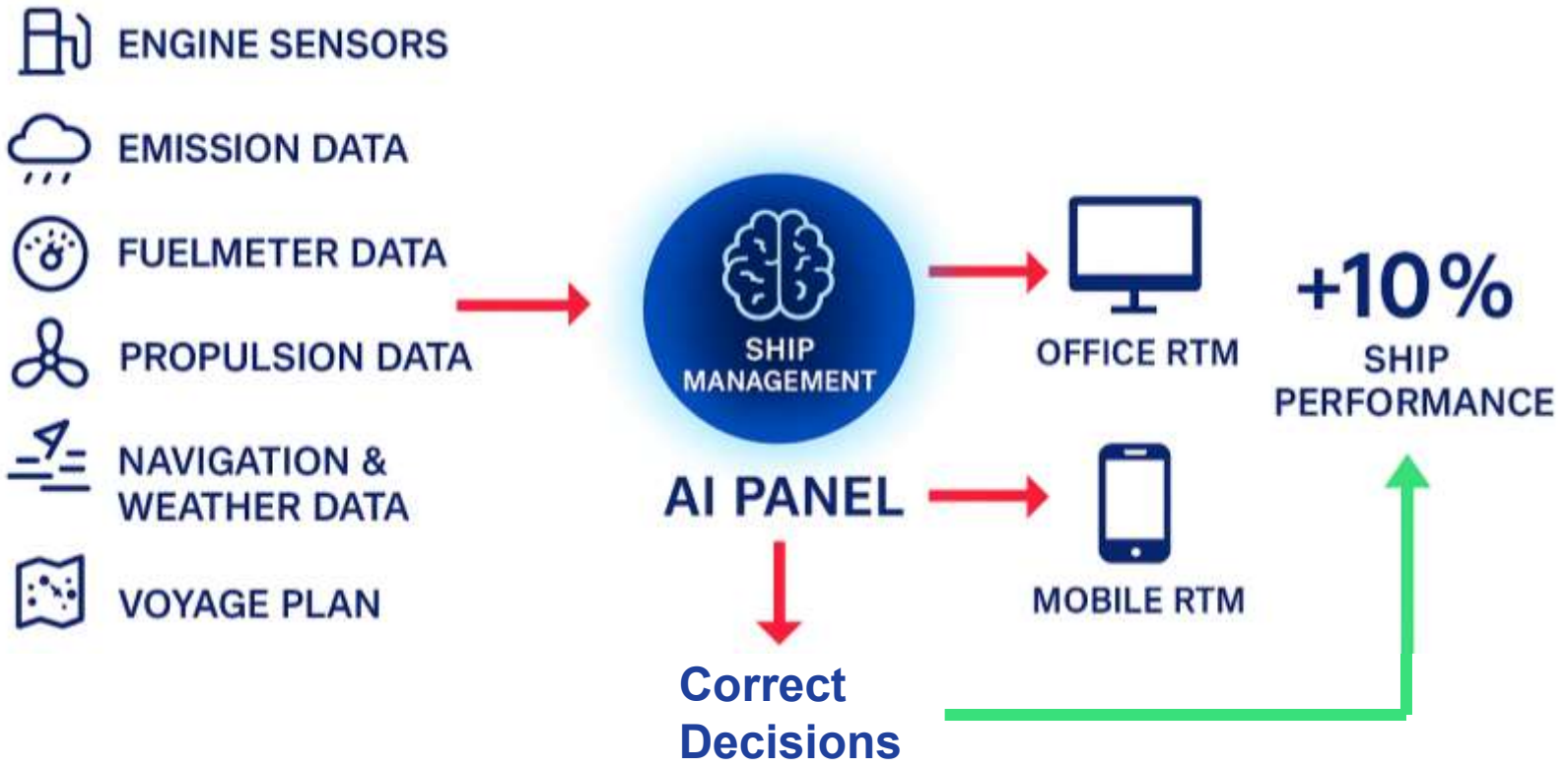
Mobile RTM

- Live metrics & alerts

Mobile RTM

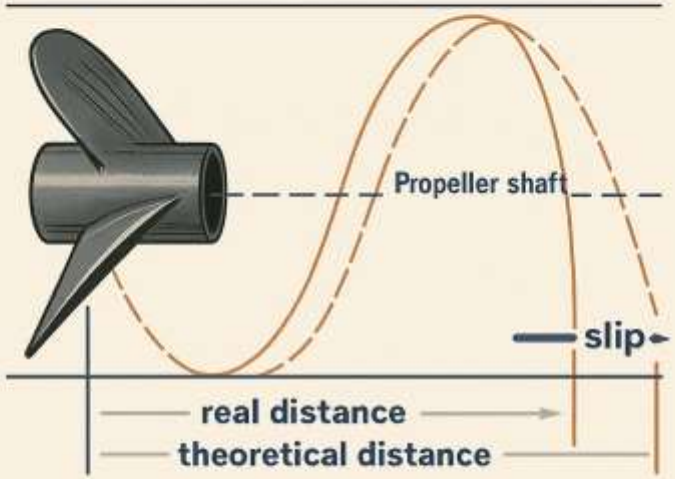
- Live metrics & alerts

OmurAI Integration System Flow



What is a Ship Slip?

Ship slip is the difference between the speed of the Engine and the actual observed speed of the ship.



What is a Ship Slip?

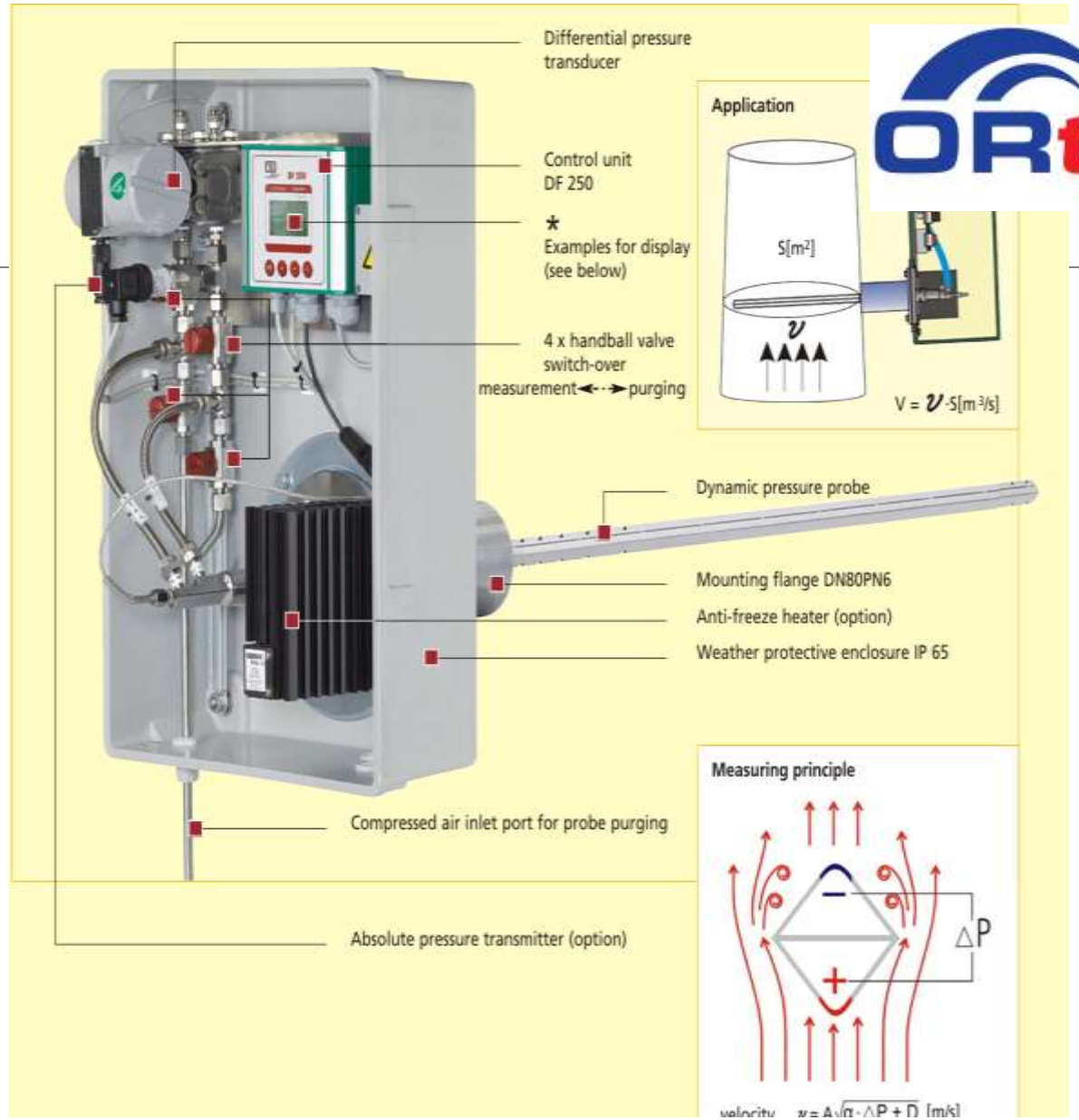
Ship slip is the difference covered or engine speed.

SLIP

Slip = 100% – Efficiency

Efficiency = observed distance covered or engine speed.

Positive slip is influenced by various reasons such as fouled bottom or hull part that offers resistance to the movement of the ship, environmental factors such as water current and wind



ORtech marine

Exhaust gas monitoring

•**Real-time CO_2 Tracking:**
Continuous monitoring of carbon emissions for accurate reporting and compliance.

•**Automated Reporting:**
Streamlines environmental documentation for fleet operators.

• **Direct Sustainability Impact:**
Reduces carbon footprint and supports greener maritime operations.

Ships Operation Data Analysis

Power Emission

Operational Emissons

Equipment Emission

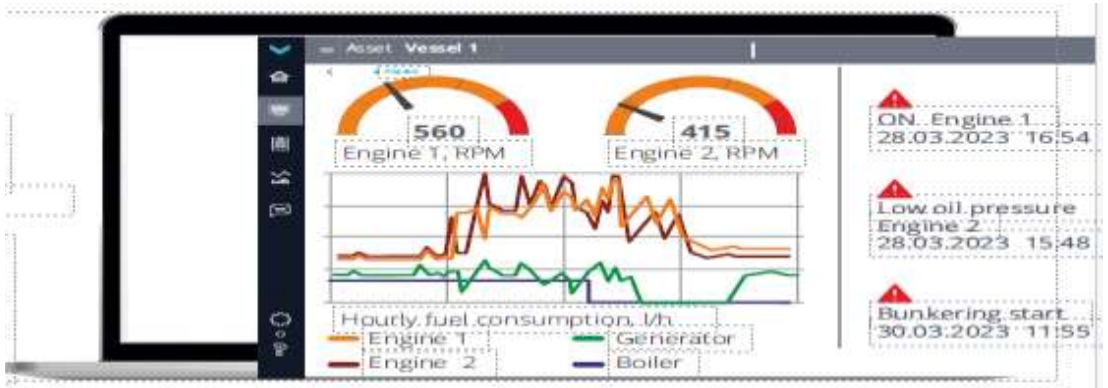
EQUIPMENT	CAPACITY	DAILY KW	YEARLY KW	FUEL ton	CO2 TON	C02 RATES
MAIN ENGINE	**10.000KW/h**	**168.000**	**34.440.000**	**6888**	**21352,8**	**0,79**
AUX ENGINE	**3X750KW/h**	**37.800**	**8.278.200**	**1655,64**	**5132,484**	**0,19**
AUXBOILER	**2.5k Kcal/h**	**13.968**	**859.032**	**171,81**	**532,60**	**0,02**
EMERGENCY	**300KW/h**	**5.400**	**5.400**	**1,08**	**3,35**	**0,00**
LOADED SAILS	100 D/Y	168.000	16.800.000	3360	10416,00	0,39
BALLASTED SAILS	60D/Y	144.000	8.640.000	1728,00	5356,80	0,20
PASSAGE SAILS	**45D/Y**	**120.000**	**5.400.000**	**1080,00**	**3348,00**	**0,12**
BERTHED	80D/Y	28.800	**2.304.000**	460,8	1428,48	0,05
ANCHORED	80D/Y	10.800	**864.000**	172,8	535,68	0,02
COOLING PUMPS	**600KW/h**	**14400**	**2.952.000**	**590,4**	**1830,24**	**0,47**
AIRCONDITION	**80KW**	**1920**	**700.800**	**140,16**	**434,50**	**0,11**
REFRIGERATING	**50KW/h**	**600**	**1.533.000**	**306,6**	**950,46**	**0,24**
AIR COMPRESSOR	**150KW/h**	**600**	**90.000**	**18**	**55,80**	**0,01**
WINCHES	**400KW/h**	**3200**	**256.000**	**51,2**	**158,72**	**0,04**
BALLAST SYSTEM	**400KW/h**	**6000**	**240.000**	**48**	**148,80**	**0,04**
LIGHTENING	**80KW/h**	**1536**	**560640**	**112,13**	**347,60**	**0,09**
				PROPULSION	**27021,23**	**0,79**

1KW	200	gr.Fuel
200gr.fuel	620	gr CO2
ME	0,6	P/P
AE	0,7	P/P
AB	0,4	P/P
YEAR	365	DAYS
FUEL T	3,10	TON CO2
SAILS	205	DAYS
STOPS	160	DAYS
2500KCAL/H	2,91	KW/h

Real Time Monitoring Applications

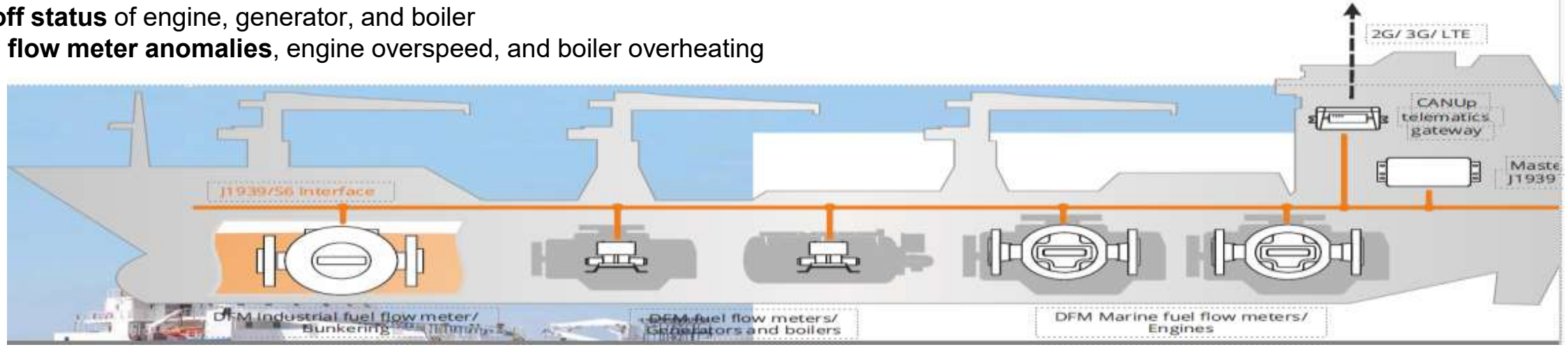
Operating Parameters

✓ **Hourly fuel consumption** of engines, diesel generators, and boilers
✓ **Operating time** of each fuel consumer in *Idle*, *Loading*, and *Overload* modes
✓ **RPM, temperature of technical fluids**, and data from **additional sensors**
✓ **Location, route, and traveled distance**
✓ **Bunkering** – duration and volume of received fuel



Events

✓ **On/off status** of engine, generator, and boiler
✓ **Fuel flow meter anomalies**, engine overspeed, and boiler overheating



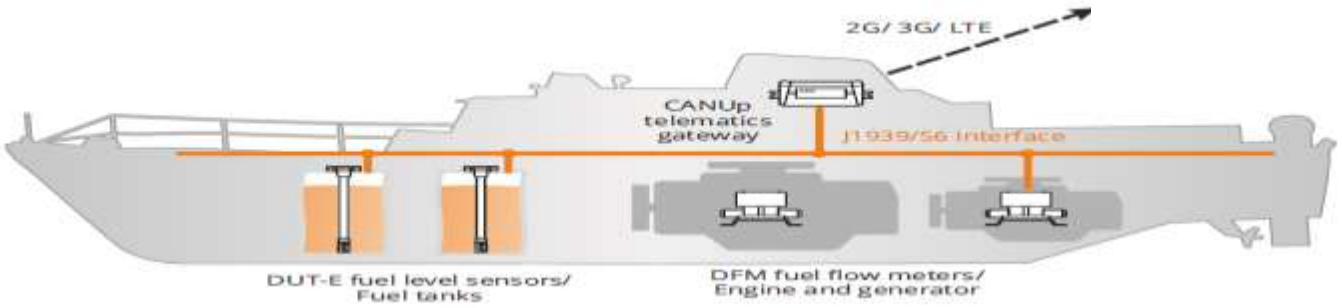
Application on Multitype Vessels

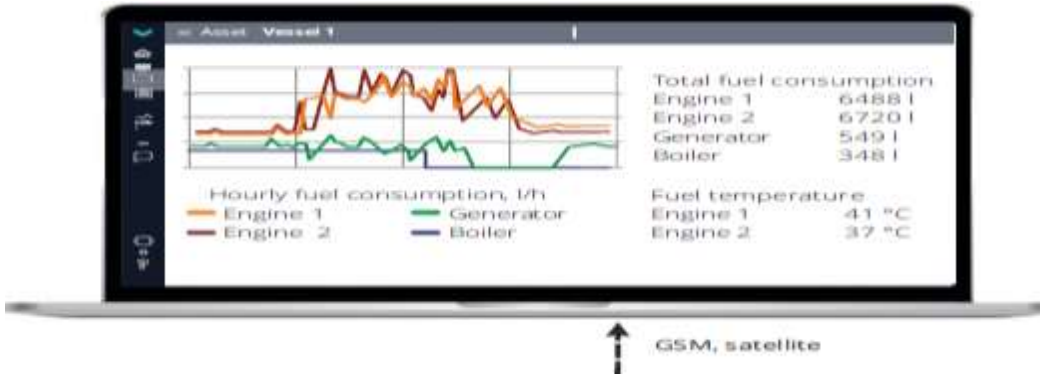
Operating Parameters

✓ **Hourly fuel consumption** of engines and diesel generators.
✓ **Operating time** of each fuel consumer by modes.
✓ **Fuel level and volume** in tanks.
✓ **Location, route, and traveled distance.**

Events

✓ **On/off status** of engine and generator.
✓ **Fuel refueling and draining** from tanks.
✓ **Fuel flow meter cheating detection.**





Conclusions

Every Vessel Has Value – Maintain, Retrofit, Sail On!

Digitalization = powerful enabler of decarbonisation

Successes: efficiency, transparency, compliance

Challenges: data, cost, cyber risk

Future depends on collaboration, interoperability, and trust

📍 **Ortech Marine – Your Tailwind at Sea,**

Keeping Your Fleet Sailing Strong

ORTECH MARINE A.Ş

Turkish Ship & Yacht Repair and Maintenance Company

Expert in engine automation, retrofitting, and overhauling.

Providing green technology; spare parts and reconditioning for ship equipment.

Thanks for listening

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