Empower your maritime operations with the VPS Emsys iS Platform

VPS Emsys introduces the iS Platform, a tool designed to meet the dynamic needs of shipowners and shipyards. Recognizing the distinct challenges of maritime applications, our platform offers a flexible and multifunctional solutions.

Unlock Your Fleet's Potential

Our platform is engineered to support a wide array of applications, ensuring you have the right tools at your disposal for optimal performance and compliance.

EXPERIENCE ▶ INNOVATION ▶ SUSTAINABILITY

Moving Forward

Leading the way for sustainable solutions

Key Applications

Moving Forward

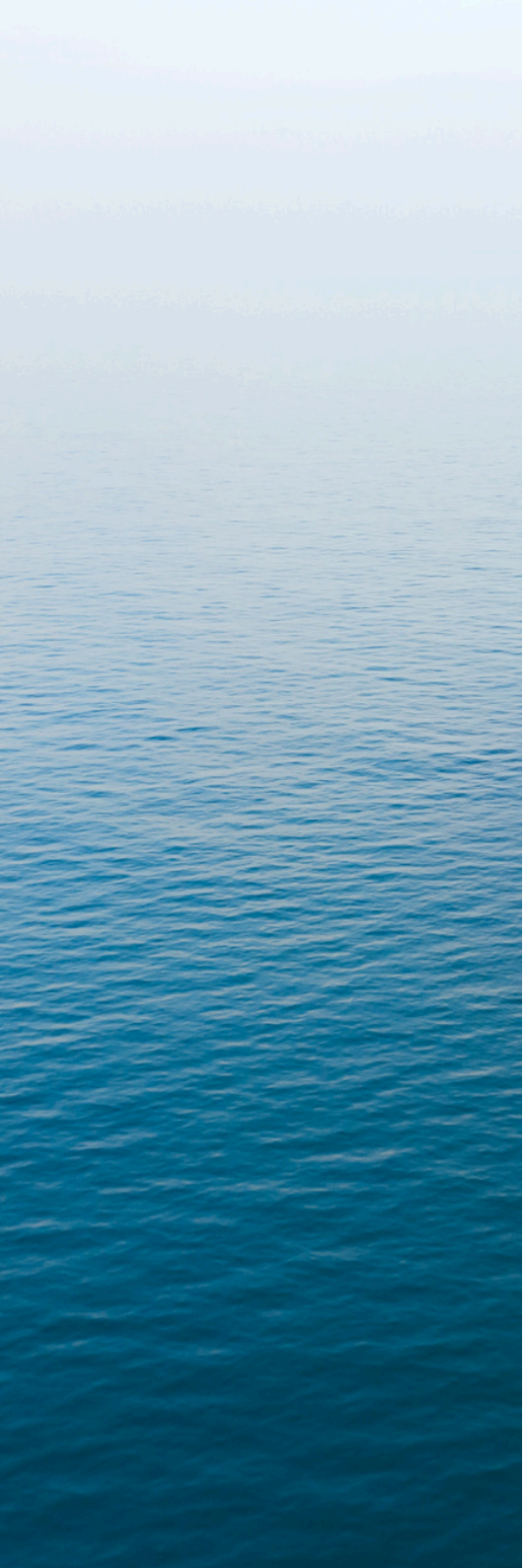
Leading the way for sustainable solutions

Monitoring Methane Slip

2020 has seen a massive increase in LNG bunkering infrastructure to cope with the rapid expansion of LNG as a marine fuel. However, there is growing concern regarding its environmental benefits given methane's properties as an aggressive greenhouse gas. LNG fuel is being promoted as an environmentally friendly 'green' option, but the methane lost during supply, production, and inefficient combustion is a pollution problem that could cancel out the fuel's initial environmental 'friendliness'. A significant number of oil majors and charterers are demanding monthly emissions inventories, including totalised methane, to include with their CSR data. Measuring methane slip has never been more important. It is therefore critical that shipowners using LNG as their primary fuel have the tools they need to measure Methane Slip. Although currently unregulated by the IMO, methane slip is certain to become in the spotlight given the widespread uptake of LNG fuelled vessels.

Discover the VPS Emsys advantage for Methane Slip Monitoring

- Methane is measured instantaneously in ppm (parts per million), readings can be referenced against the engines performance data and alarms sounded when thresholds are exceeded.
- VPS Emsys utilises a highly accurate laser sensor which reacts far quicker than traditional CEMs type instruments, this rapid speed allows multiple engines to be monitored from a single VPS Emsys system.
- VPS Emsys records the mass of methane (kg/tons) produced on an hourly, weekly, monthly, and yearly basis, and generates PDF reports.
- In some rare occasions, methane slip can be so bad that a build up of unburned methane can be in the exhaust uptakes, VPS Emsys can provide alarms which alert operators to the potential safety/fire hazard.
- The VPS Emsys-iS is extremely compact and can be retrofitted easily to any vessel and any engine type (2-stroke or 4-stroke).
- Measuring the unburned hydrocarbons in an engine exhaust may alert operators to resolve any technical issues when engine performance limits are exceeded. Rapid resolutions of faults help prevent significant increased costs in fuel consumption.



Drillship & Offshore Applications

Drillships and Offshore production and storage units for oil and natural gas provide a unique challenge for environmental compliance. The vessels are usually stationary, therefore, when operating within the maritime boundaries of a nation, are often required to conform to local emissions regulations to gain an operating permit. VPS Emsys has extensive experience in solving air permit applications and have provided a comprehensive consultancy services to support air permit submissions. Whether a drillship, semi-sub, FPSO, FSO, FLNG, Shuttle Tanker or offshore construction/decommissioning vessel, VPS Emsys has proven solutions to measuring emissions for compliance applications

Discover the VPS Emsys advantage for Drillship & Offshore Applications

- A comprehensive suite of monitored gases and particulate matter to cover most offshore applications.
- VPS Emsys can provide NTE (Not to Exceed) reporting and/or total pollutant inventory.
- VPS Emsys can utilise all 3 allowable methods of exhaust gas measurement, Carbon Balance, Mass Flow Measurement or air/fuel to cover the requirements of typical air permits.
- VPS Emsys is extremely compact and can be retrofitted easily to any vessel and any engine or boiler, this is a significant benefit where space is at a premium on retrofit applications.
- VPS Emsys is highly robust and suitable to operate in high temperature/high humidity environments without supplemental air conditioning.
- VPS Emsys is Type Approved for Offshore applications by ABS and DNV-GL.

Monitoring SCRs

Discover the VPS Emsys advantage for Monitoring SCRs

- VPS Emsys is compact, lightweight, and really simple to install. It can measure up to 4 SCR's from a single enclosure. To further keep our system small the Heated lines contain the power supply for each probe. Thus only one power supply is necessary, making retrofit applications far simpler.

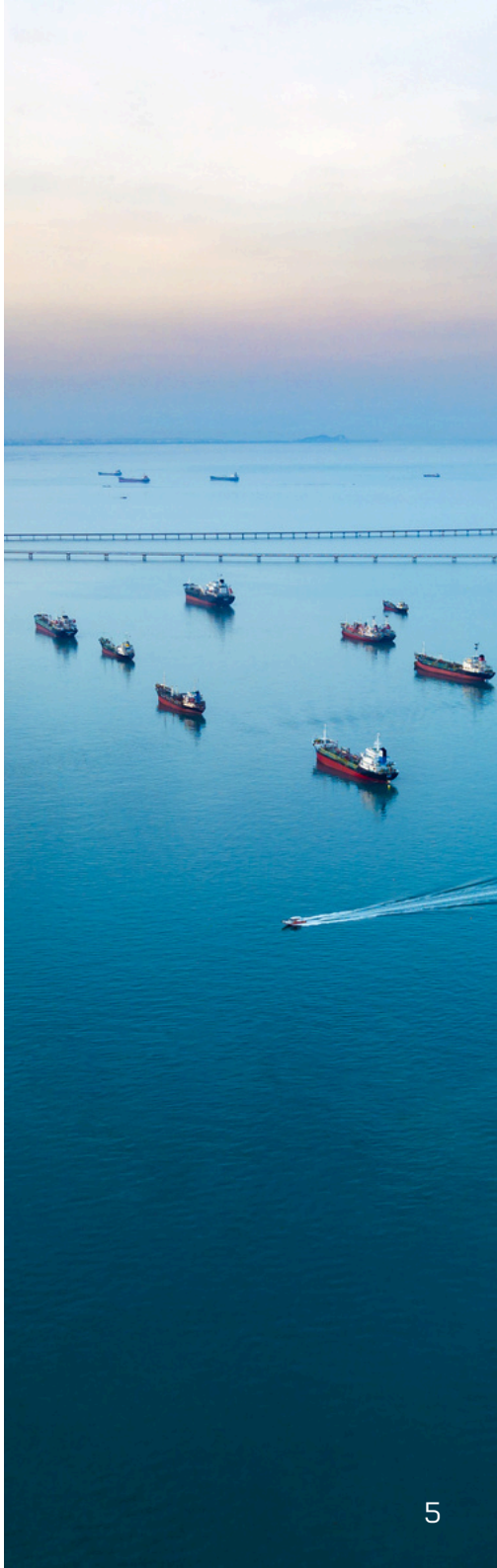
- VPS Emsys uses a laser sensor. The laser technology is extremely fast meaning multiple SCRs can be monitored from a single laser sensor.

- VPS Emsys systems do not require any air conditioning within the laser enclosure. Not only does this allow the system to be sited very close to the exhaust stacks, but also removes the need for refrigerant gases. This eliminates the requirement for storing or disposing of refrigerant gases and reduces maintenance time and costs.

- VPS Emsys systems measure the gases 'Hot and Wet'. This means that we don't have complicated 'gas conditioning' apparatus which is usually expensive to maintain. We also return the measured gas to the stack so there are no issues with toxic gases in enclosed spaces.

- VPS Emsys is Type Approved by ABS, DNV-GL, and KR for MEPC. 198 (62) for engines fitted with an SCR. Our team have experience on many different types of Scrubber. Our unique Patented technology was specifically designed for maritime use over many different applications.

- VPS Emsys can be optionally configured to measure 'Ammonia Slip', although not an IMO maritime requirement other national regulations often require the measurement of NH3 in the range 0-10ppm.



Monitoring Scrubbers

Discover the VPS Emsys advantage for Monitoring Scrubbers

- The VPS Emsys-iS is compact, lightweight, and really simple to install. It can measure up to 4 scrubbers from a single enclosure. To further keep our system small the Heated lines contain the power supply for each probe. Thus only one power supply is necessary, making retrofit applications far simpler.

- VPS Emsys systems use a laser sensor. The single biggest advantage of this is the quicker reaction time. Typically IR and UV analysers can take up to a minute to measure SO2 accurately, VPS Emsys takes less than 10 seconds due to its unique Quantum Cascade Laser sensor.

- VPS Emsys systems do not require any air conditioning within the laser enclosure. Not only does this allow the system to be sited very close to the exhaust stacks, but also removes the need for refrigerant gases. This eliminates the requirement for storing or disposing of refrigerant gases and reduces maintenance time and costs.

- VPS Emsys systems measure the gases 'Hot and Wet'. This means that we don't have complicated 'gas conditioning' apparatus which is usually expensive to maintain. We also return the measured gas to the stack so there are no issues with toxic gases in enclosed spaces.

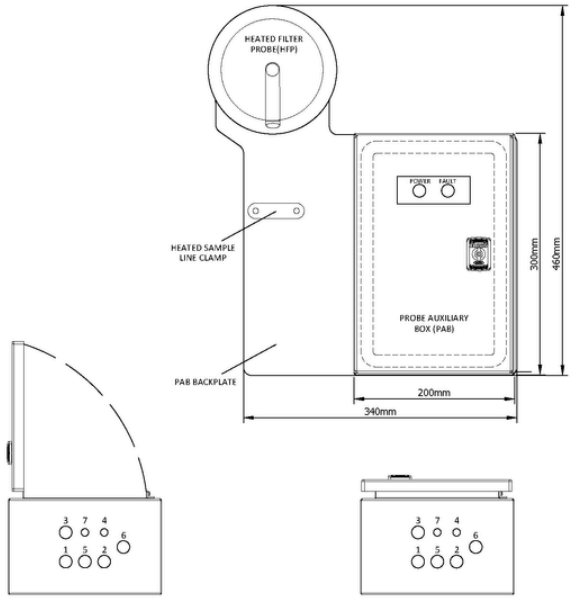
- VPS Emsys is Type Approved by ABS, DNV-GL, and KR with an option for siting the main enclosure on the 'weather deck'. In some applications this capability makes the retrofit procedure far easier.

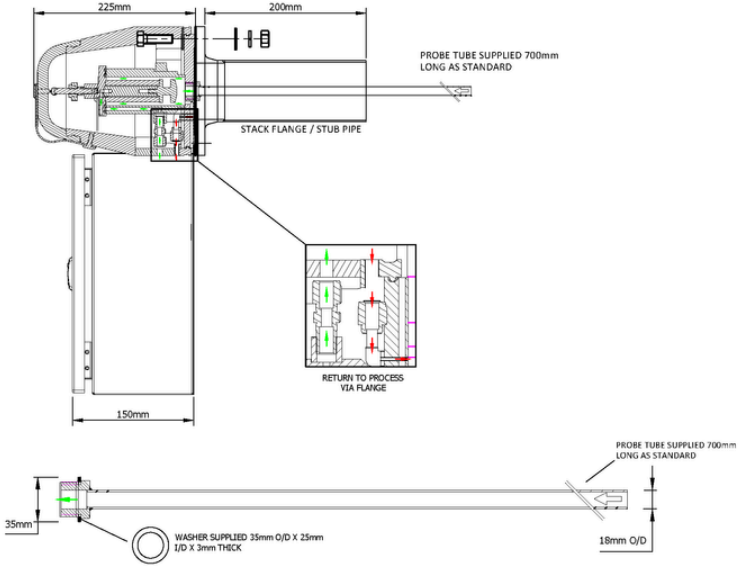
- The VPS Emsys Maritime Team have experience with many different types of Scrubber. Our unique Patented technology was specifically designed for maritime applications and can be customised to exact application requirements.

Marine PM & Opacity Monitoring

Discover the VPS Emsys advantage for Marine PM & Opacity Monitoring

- The VPS Emsys-PM measures Visible Smoke and PM with one single sensor.
- The VPS Emsys-PM can be used to comply with US EPA and Alaska DEC visible smoke regulations. Additionally, with the optional OPC reporting software the PM can be used for '3-Minute Rule' reporting.
- Our system has virtually maintenance free operation, and the optics are simple to clean in seconds.
- We included optional alarm outputs to alert crew to changes in smoke emissions, which can prevent heavy fines during transient operations.





Technical Specification

Model Number	Emsys-iS
Ambient Temperature	0-+55 °C
Measurement Method	Extractive using Heated Filter Probes and Heated Sampling Lines, Hot-Wet sampling on a 'round-robin' basis. Sample returned to process
Measurement Technique	Multi-Channel QCL laser, IR Absorption Spectroscopy
Laser Classification	CLASS 1 BS EN 60825-1:2007 Safety of laser products Equipment classification and requirements (identical to IEC 60825-1 2007)
Repeatability	+/-2%
Accuracy	+/-2%
Linearity	R2 for a linear fit is ⩾ 0.9990. Error < 2% of full scale when analyzed to MCERTS standard
Measurement Rate	Up to 10 Hz
T90 Time	>10s for all gases except NH3
Zero Noise (2 sigma)	< detection limit for each component
Span Noise (2 sigma)	< 2% of full range for each component
24 hour zero drift	< detection limit for each component
24 hour span drift	< 2% of full range for each component
Pathlength (Cell internal)	2m
Cell temperature	180 °C
Cell pressure	300 Torr ±50 Torr
NO	0-2000 ppm (LOD 5ppm)
NO2	0-500ppm (LOD 1ppm)
CO	0-3000 ppm (LOD 5ppm)
CO2	0-15 % (LOD 0.1%)

Model Number	Emsys-iS
SO2	0-200 / 0-500 / 0-1000 ppm (LOD 3ppm / 1ppm)
H2O	0-20 % (LOD 0.1%)
CH4	0-3000 ppm (LOD 5ppm)
Environmental Specification	Tested to IACS-E10
Analyzer Equivalence	ISO 8178/1 Part 7
Type Approvals	ABS, DNV-GL, Korean Register
# of Measurement Points	Single Enclosure –Up to 4, Multiple Enclosures (Up to 3) 12 points
Power Supply	230 VAC –Power requirement (kW) subject to # of points & length of Heated Sample Line
Air Supply	NOT REQUIRED
Enclosure Air Conditioning	NOT REQUIRED
Enclosure Rating	IP55 standard / IP56 Optional (weather deck mounting)
Enclosure dimensions	800mm (H) x 600mm (W) x 300mm (D)
Exhaust duct sizes	300mm –5metres
	IACS E10
Communications Protocol	MODBUS RTU
Typical Applications	MARPOL Annex VI (NOx), engine testing, EGCS compliance monitoring, methane slip measurement, mass emissions totalizing, funnel smoke monitoring, charterer's CSR reporting, Class Notation compliance
US Patent	8,184,296,B2
EU Patent	EP 2 394 153 B1
Heated Filter Probe / PAB Enclosure / PM Enclosure Rating	IP65

OPC Visible Emissions Reporting Software

Key features

- OPC Software interfaces to new or existing opacity & PM sensors.
- Meets the reporting requirements of Alaska DEC 18 AAC. 50.070.
- Alarms generated to warn operators if the 3-minute rule is breached.
- Provides 12 months historical backup of emissions data.
- Trend Graphs for engines, boilers, and incinerators, with integration for Power, % O2 and other relevant data.

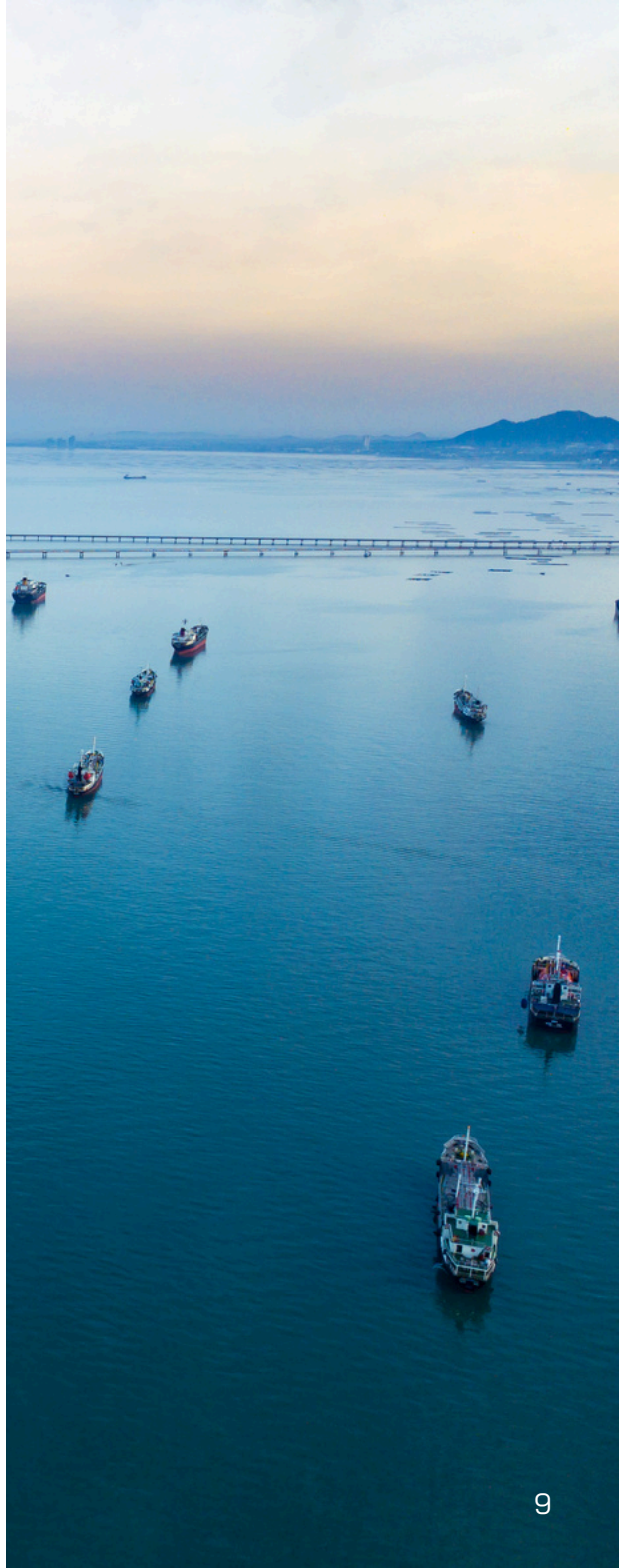
Typical applications

- Alaska visible smoke regulations.
- US EPA visible smoke regulations.
- Smoke Monitoring of diesel engines and boilers whilst in port or when transiting close to shore allowing ship's crew instant notification when smoke thresholds are exceeded.
- Charterer requirements and compliance with standards such as TMSA or environmental Class Notations.
- Maintenance indications of diesel engines.
- Optimisation of combustion in boilers.

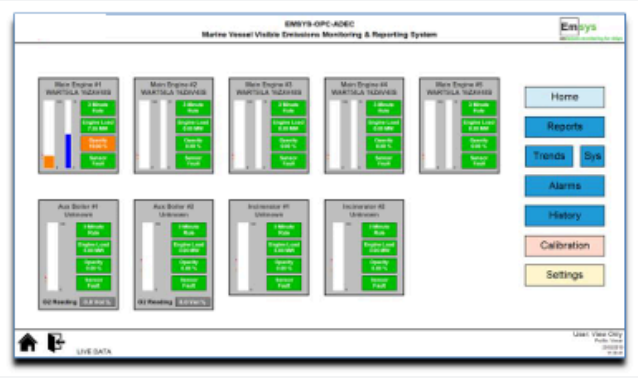
OCIMF

Alaska Department of Environmental Conservation
DIVISION OF AIR QUALITY

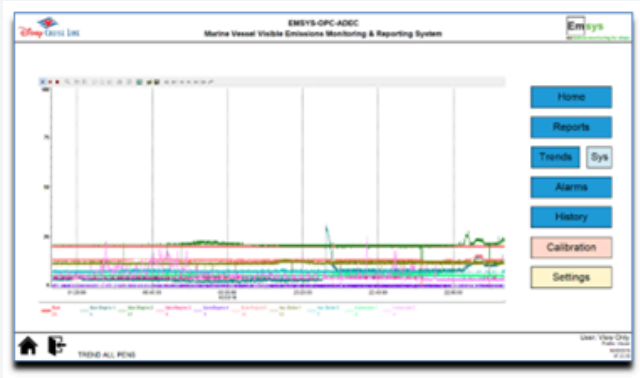
EPA United States Environmental Protection Agency



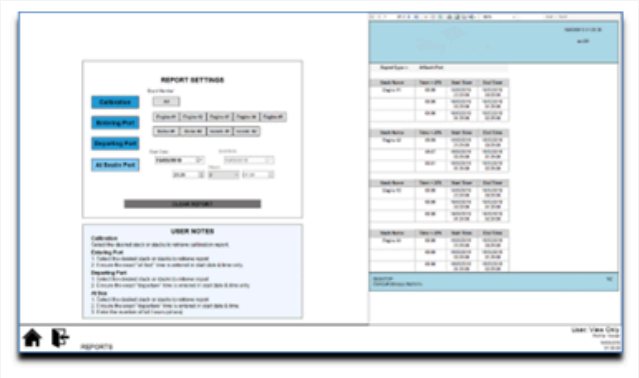
OPC Visible Emissions Reporting Software



- Configurable for engines, boilers and incinerators
- Live PM/Opacity/engine load recording
- Configurable alarms and historical reporting
- Recordable sensor calibration data
- Up to 10 stacks can be monitored



- Live trending available for each stack or all monitored stacks



- Specific Reports designed to meet the requirements of Alaska DEC 18 AAC. 50. 070
- 3-Minute rule warning and alarms
- Specific report for entering/leaving port plus snapshots for each installed stack to provide documentary evidence of visible smoke emissions

Mass Emissions Reporting

Why is Mass Emissions Reporting important?

The IMO and regulations

Since July 2018, the EU has required ship owners to provide information for EU-regulation 2015/757. This requires ship owners and operators to annually monitor, report, and verify CO2 emissions for vessels larger than 5,000 GT and which call at any EU port on a per voyage basis.

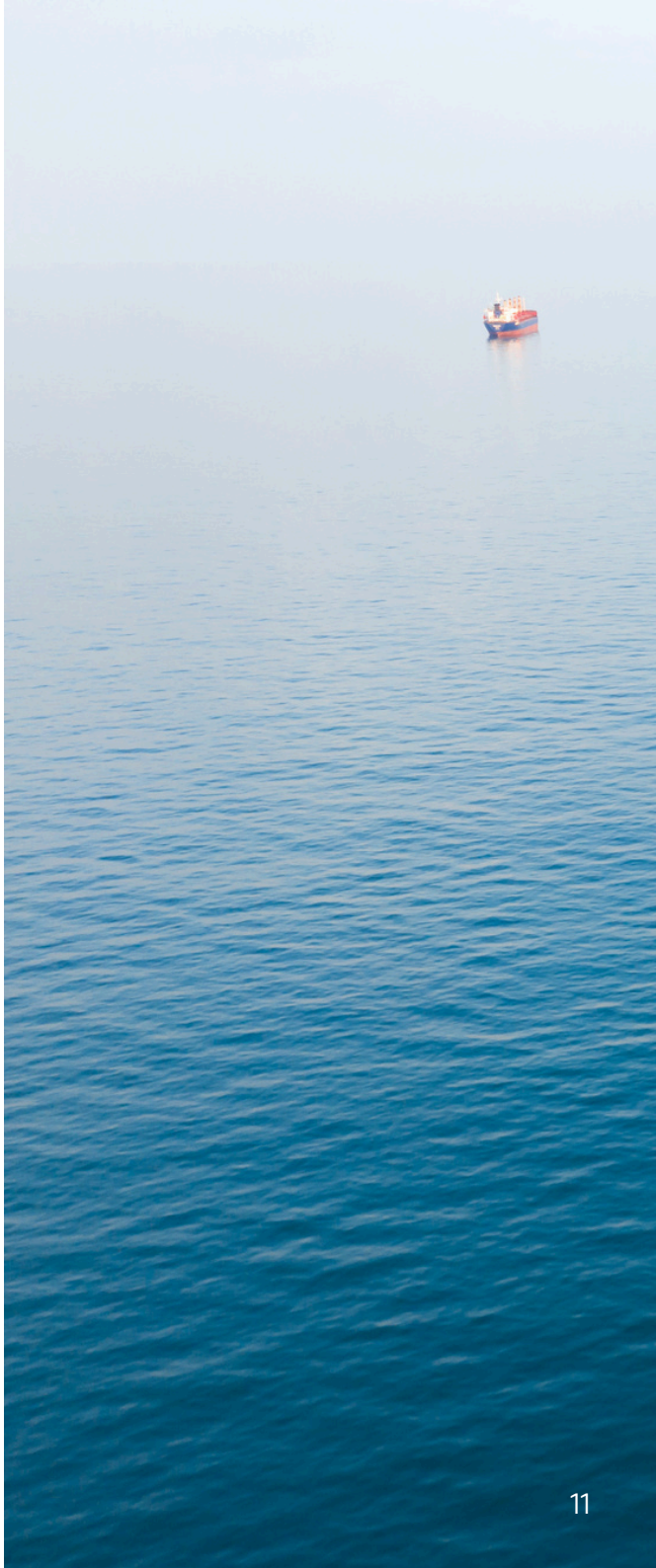
However, regulations covering a vessels fuel efficiency were introduced by the IMO in 2020 in the form of Carbon Intensity Indicators (CII). Regulations on mass emissions are increasing, with individual CII targets even being discussed in MEPC 75. Each year these regulations are discussed and heightened with the IMO's focus moving on from CO2 to other emissions. With the growth of the LNG industry, methane slip is especially being considered, and greater regulation encouraged internationally.

Value

With charterers under pressure to provide monthly figures for energy giants and their CSR reports, exact emissions measurement is a valuable tool. Currently, charterers estimate emission output based on fuel input, but with the iS providing accurate measurement of emissions output, overestimating is impossible, and shipowners are able to future proof against per-unit fees and emission credits.

The Environment

Each year there is a growing emphasis on the collective greenhouse gas output of the shipping industry. Most notably by the European Commission to create a bench-marking system for the EU's policy for reducing domestic greenhouse gas emissions. The UN and it's internationally applicable Paris Agreement is also relevant in the regulation of greenhouse gas emissions by the maritime industry.



Mass Emissions Reporting

Why monitor methane slip?

Mass emissions capability is surprisingly not found in all Emissions Monitoring Systems, but with the rise of LNG, it has become a necessary part of any shipowner's toolkit.

The total methane slip from both the production of methane and the inefficient combustion of LNG in marine engines is significant. Methane is the particular concern not only of organisations like the IMO, but of the maritime industry as a whole. Higher levels of pollution mean more regulations, fines, ECAs, taxes, and costly fuel tokens to offset the damage, and of all the greenhouse gases Methane is one of the most unpleasant. Methane is 84 times more potent than carbon dioxide because of how quickly it absorbs heat.

VPS Emsys made sure to consider specialist applications in the design of our EMS, resulting in the VPS Emsys-iS. With modular gas options and additional capabilities like Particulate Matter monitoring, the iS platform has Mass Emissions Reporting refined in one of the most compact systems in the market. This Mass Emissions capability accurately measures total emittance of any pollutant gas needed, in whatever combination, and from multiple engines. This makes the iS a powerful tool for any shipowner considering or already using LNG.

LNG fuel and it's unfortunate methane slip problem is not going away any time soon, in fact the opposite, as there is still the widespread agreement that LNG fuel is the way forward to the maritime industry's collective decarbonisation. Shipowners must prepare for the fallout of methane slip with emissions monitoring systems that have mass emissions capability.

How can VPS Emsys help?

1. Perhaps most important is the iS platform's use in methane (CH_4) mass emissions reporting. Methane (CH4) mass emissions can be measured in pure LNG or 'dual-fuel' (DF) powered ships. The VPS Emsys-iS can determine how much CH4 an engine emits (CH4 can be up to 30X more potent than CO2 as a GHG) or 'methane slip' which is a known problem with some DF 4-stroke engines.

2. Methane monitoring is becoming an increasingly frequent point in the IMO's working groups with methane slip considered in the most recent MEPC (Marine Environment Protection Committee) meetings and regulations imminent.

3. The iS can also accurately record CO2 mass emissions (kg/tonnes or kg/s mass flowrate) for use in analysing CO2reduction, based upon actual measurement not estimation of fuel consumption. This can be helpful for determining the effects of operational and technical modifications for EEXI /CII (Carbon Intensity Indicator), which is useful given the IMO's increasing focus on a vessels Carbon Intensity Indicator.

4. The iS can accurately provide measurement of NOx flowrate, which can be useful in determining the efficiency of exhaust gas treatment systems (SCR) and other fuel saving/emission lowering technologies and fuel additives.

If your specific application is not listed, reach out to us.
Our platform is designed with adaptability in mind.

Contact VPS Emsys Today

Discover how the VPS Emsys iS Platform can transform your operations.
Get in touch with our experts to learn more.

decarbonisation@vpsveritas.com