



DNV Petroleum Services

Your Fuel Management Partner

MANAGING RISK



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DNV Petroleum Services

Significance in the industry

DNVPS launched our commercial fuel testing services in 1981 to meet the needs of a maritime community seriously concerned about the quality of bunkers supplied in ports worldwide. Over the years, the problems encountered by shipowners and operators in the procurement and use of marine fuels have not diminished. Indeed, you must safeguard your vessels by ensuring the bunkers received are not used until tested.

DNVPS fulfils the requirements of an independent international testing service which is credible both to shipowners and suppliers alike. We operate five wholly-owned and accredited laboratories strategically located in Singapore, Rotterdam, Fujairah, Houston and Oslo so that fuel samples from your ships will reach the appropriate DNVPS lab in the shortest possible time. This in turn facilitates fast turnaround of test results and prompt technical advice.

DNVPS has thus far tested more than 1.2 million marine fuel samples. Our 65 per cent market share is well supported by an extensive monitoring network which allows us to spot fuel quality problems in bunkering ports around the world. You will be immediately notified of these problems through our Bunker Alert service, exclusively available to members of the DNV Fuel Quality Testing (FQT) Programme.

DNVPS is leading the development of extended analytical services for marine fuels, including ignition and combustion quality as well as advance investigative testing for detecting chemical wastes and other contaminants. These services are conducted in-house, and we also have access to all testing services available throughout DNV, such as the materials laboratories in Singapore and Oslo.

1981

65%

1.2m



Why test your marine fuels

Unpredictable fuel quality is a regular cause for concern among ship operators. Testing of marine fuels can:

1. Prevent operational problems for your vessels
2. Prevent commercial losses as a result of using 'off specification' bunkers
3. Provide indication of compliance with MARPOL Annex VI regulations
4. Assist in the filing of claims against suppliers for off-specification fuel
5. Help you avoid unnecessary delays and other inconveniences at the destination port resulting from bunkering off-specification fuel

Reasons for engaging DNV Petroleum Services

Superior fuel analysis expertise and technology

Since 1981, DNVPS has been in the forefront of bunker fuels research and development.

Not only is the DNV Fuel Quality Testing Programme (FQT) supported by state-of-the-art analytical equipment, we also have access to the wide-ranging resources available in DNV. You can be assured of the support from a team of specialists with a complete spectrum of expertise in marine fuels and shipboard operations.

Superior bunker quality database and applications

The DNVPS cumulative testing volume continually enhances our fuel quality database, already the most extensive of its kind in the market. With this database, DNVPS can help you plan your bunkering activities by providing accurate information on fuel quality characteristics and trends pertaining to specific bunkering destinations around the world.

Superior service network

DNVPS owns and operates five specialist fuel laboratories. Supported by our global customer service network and top courier companies such as DHL, TNT and FedEx, our multiple laboratories not only minimise sample delivery time, but also ensure that you will receive test results and technical advice promptly.

For your convenient access, all fuel quality test results are uploaded to DataAccess, our online customer service website.

Superior quality control and assurance

As an ISO 9001 certified company, safety and quality practices are a top priority at DNVPS. Our testing facilities are also accredited to ISO 17025. You can therefore be assured of services and customer care that are timely and reliable.



Bunkers are typically the largest contributor to the operational costs of a ship, with the physical transfer of fuel often taking place thousands of miles away from the contracting offices. As neither the buyer nor the seller is present to witness the bunker quantity transfer and sampling procedures on board, any post-delivery investigation on quantity shortages is usually futile and inconclusive. Protests, demurrages, physical shortages, legal fees, management time, loss of goodwill, inconvenience and stress add to overall costs.

Responding to these concerns, DNV Petroleum Services, the world leader in bunker fuel testing, offers an impartial and independent Bunker Quantity Survey through its own in-house surveyors in major bunkering ports worldwide. DNVPS BQS surveyors provide comprehensive and credible documentation of delivered fuel quantities, and ensure that bunkering procedures compliant with MARPOL Annex VI requirements are observed. As a complementary service to the DNV Fuel Quality Testing Programme, our surveyors also facilitate prompt dispatch of fuel oil samples to the nearest DNVPS laboratory. Given that bunkers account for as much as 70% of the vessel's operating costs, it is in the fuel buyer's interest to engage a DNVPS surveyor for quantity verification. In a bunker dispute, the fuel buyer will be well placed to substantiate his claims.

DNVPS is the first company to implement a worldwide Code of Practice with regular on-the-job quality assurance audits to ensure a high level of integrity and service performance. We actively promote best practices in the trade.

Scope of Service

- DNVPS surveyors remain onboard for the entire duration of the bunkering, ensuring continuous supervision and support.
- DNVPS surveyors will make accurate assessment of the opening soundings on both the vessel and the bunker tanker to determine actual fuel quantity transferred. Surveyors are required to use their own measuring tape and digital thermometers instead of third party instruments which may introduce uncertainties.

- All vessel and bunker tanker measurements are recorded on the spot in the DNVPS Gauging Ticket, a copy of which will be given to each of the parties present. In the event of uncertainty or during routine quality control checks, these independent records can be recalled for verification.
- The DNVPS gauging ticket and recording procedures provide an audit trail which detects alteration of figures and other malpractices.
- Where permitted, digital photographs are taken as evidence of the survey operation. The photographs include those of the vessel, bunker tanker, sampling equipment and location.

Reporting

Based on the supplier's bunker receipt density, calculations are carried out using ASTM Tables 54B and 56 to determine the preliminary weight of the fuel transferred. However, DNVPS BQS requires actual density, viscosity and water for conclusion. In order to do this, the sample is promptly dispatched to the nearest DNVPS laboratory for testing. The results for density, viscosity and water of the fuel sample are factored into the final recalculation of the actual weight of the fuel delivered. The DNVPS Bunker Survey Report is then transmitted by email or fax to the client.



Sixty-five percent of worldwide marine casualties involve machinery failure, collision or stranding. Machinery failure is the single largest cause of casualty, accounting for approximately 25% of the incidences. Of these, many can be traced back to sub-optimal fuel quality.



DNV Petroleum Services offers Technical Troubleshooting services to both maritime and utilities industries. By understanding the root causes of a problem, a risk management strategy can be established to mitigate future fuel related risks. Third party investigations are often needed for immediate identification of a problem to determine the parties responsible and accountable. Case studies show that 3-5% savings on the maintenance budget can be obtained based on long term risk mitigation, resulting in lower maintenance costs.

To get to the bottom of fuel-related problems, technical evidence from the installations must be collected and documented. Analysis of fuel and lubricating oil samples, damaged parts, replicas and other items can give a good indication of the course of events leading to a breakdown.

DNV Petroleum Services works closely with DNV metallurgical laboratories in these investigations and provides extensive documentation on the cause of an incident.

Technical Troubleshooting goes beyond solving the immediate problem, but also offers risk management reviews, covering:

- Operational risk mitigation
- Contingency plans for your business, or for the individual vessels
- Risk management framework and/or technical business continuity planning

Finally, Technical Troubleshooting can provide thorough litigation support when legal channels are involved in resolving disputes between the parties involved.



In an increasingly challenging market where economic, technological and legislative challenges are constantly imposing on ship operators, Fuel Performance Consulting offers impactful solutions on all fuel-related aspects of vessel operations.

Regulatory Competence and Compliance

DNVPS consultants will assist clients in planning strategies to comply with increasingly stricter environmental regulations. Leveraging on the knowledge and expertise accumulated over 30 years in the commercial bunker management business, DNVPS will help you with sampling procedures, Marpol requirements, compliance issues, fuel change-over procedures and other areas. We can also assist with fuel procurement strategies, risk management, as well as training and awareness-building. From the projects carried by DNVPS thus far, the savings potential we have been able to identify for our clients' fuel bills are considerable.

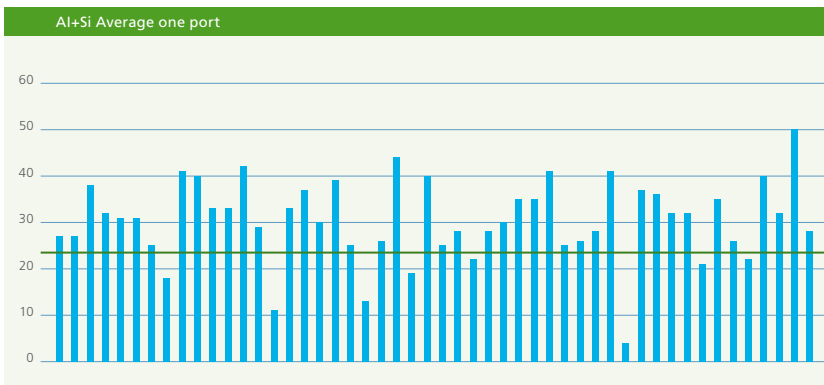
Bunker Purchasing Best Practice

Marine fuel management has undoubtedly become a lot more complex than before, with present decisions having significant consequences in the future. The fuel purchasers

have to take a broader perspective of fuel management, by thinking beyond quantity and quality verification when dealing with bunkers. With this adjustment in mindset, operators will find that fuel efficiency can be enhanced by looking into the many different but inter-connected practices and issues in ship operations, such as governance and selection of fuel suppliers.

Fuel Risk Management

How does your company comply with external standards like HAZOP, EEOI, EEDI and TEEOI? What about determining fuel suitability and quality benchmarks for the installations on your vessels? These are factors to consider when a bunker programme is set up. Key Performance Indicators are also important to enable operational monitoring, alongside practical operational tools.



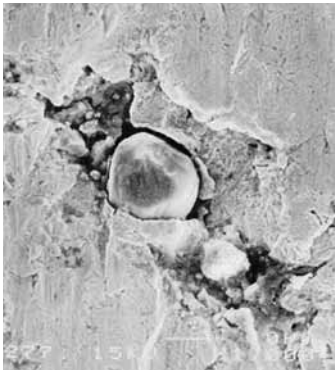
Which supplier would you choose?

Litigation Support Services

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Claims handling is an integral part of managing ships. DNVPS offers Claims Support and Expert Witnessing Services to operators of ships as well as power plants.



DNVPS accounts for about 65% of all tested fuel samples globally, out of which approximately 3.3% are critically off-specification. All off-specification fuels will receive pro-active intervention from DNVPS and some will require extensive assistance by a Claims Advisor.

Customer feedback suggests that many small and medium claims are ignored or dropped due to lack of resources in shipping companies. Larger claims usually result in litigation, which may in turn require the services of Expert Witnesses. DNVPS is among the very few that can assist ship operators in this area. We have highly qualified and experienced people who will provide expert evidence in courts and tribunals.

Claims Support

Claims support is a high value service for customers who need advice and assistance in how to deal with bunker disputes. The intention is to settle disputes quickly with low costs to avoid lengthy and costly processes. The service offers guidance on how best to proceed in a dispute. DNVPS also gives advice and assistance in gathering the evidence needed to support a claim, or defend against a claim.

We can also assist clients' lawyers by providing important factual evidence and documentation. Our claims support covers simple recovery of losses from density differences to much more complex technical cases.

Expert Witness Service

The DNVPS Claims Advisor will give expert evidence under oath (or affirmation) in a court case. In this role, it's important to be impartial and present factual statements and findings. Expert witnessing is an overriding duty to assist the Court or Tribunal. The Claims Advisor must exercise reasonable care and skill, and comply with professional and ethical practices. Opinions must be independent and DNVPS Claims Advisors will confine their views to issues which are material to the dispute. They are trained in matters concerning procedure, court familiarization, cross-examination and report writing.

The services of DNVPS Claims Advisors are available to the legal market in the key maritime locations.



Through increased access to factual data and improved knowledge it will be easier to make informed choices regarding fuel purchases. It will also be possible to capture occurrences that normally wouldn't be registered.



By obtaining information from DNVPS' extensive fuel database, ship operators and fuel purchasers will improve their market knowledge. This will help them make informed choices regarding fuel purchases.

Information that can be provided typically includes:

- Fuel Management Performance Reports
- Bunker Alerts
- FuelWise purchase support
- Sulphur statistics
- Support for pre-bunkering decisions
- Post-bunkering benchmarking
- Tailored reports for ports, fleets, segments and global markets

Why benchmark fuel?

Bunkers are a derivative of crude oil. Due to the changing regulations pertaining to marine fuel, suppliers have to blend the fuel before selling it to the market. While testing is always necessary to assess the relative quality of the bunkers purchased, we have found that through our database and statistics, we are able to formulate consistent trends on the quality of fuels from bunkering ports around the world. These trends in turn give purchasers the ability to assess individual bunkering ports and plan their fuel purchases in a more cost effective manner.



Shipping is an industry in continuous evolution and over the years it has experienced dramatic changes. This has led to a focus on short-term fixes rather than sustainable changes.



Shipping companies and technical management companies are often lean and focus mainly on daily operation. Operating in a compliance-driven industry with strict environmental regulations can, for instance, exacerbate the challenges resulting from a dearth of skilled manpower in the shipping industry.

To help shipping companies in their training needs, DNVPS offers an extensive range of courses conducted onshore as well as onboard.

These courses cover:

- [Fuel Management](#)
- [Bunker Quantity Determination](#)
- [Bunker Sampling Training](#)
- [Fuel Quality Basic Course](#)
- [Fuel Legislation](#)
- [Fuel Treatment](#)
- [Fuel Claims Handling](#)
- [Fuel System Design](#)
- [Fuel Specification](#)

In addition to the courses mentioned above, DNVPS arranges round-table discussions with clients. Our experts are also regularly invited to speak at major maritime conferences.

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