



ENABLING TRANSPARENCY IN FUEL QUALITY TO AUGMENT OPERATIONAL EFFICIENCIES

Dravam Pte Ltd is a fluid software and data company, developing and deploying continuous and comprehensive fluid quality monitoring solutions. Their patented Inline Scanning Solution – dRSCAN™ monitors fluid quality by utilising machine learning (ML) augmented multiphase algorithms to detect patterns of flow and fluid properties. This provides novel information on quality and comprehensive insights to improve transparency and allow efficient handling of the fluid.

The Journey So Far

Dr. Vivek Premanadhan is well versed in developing multiphase algorithms and based his PhD research on flow assurance in offshore pipelines. In pursuit of commercialisation of the technology via NUS' Graduate Research Innovation Programme (GRIP), he met Derrick Lee, an experienced venture creation and investment entrepreneur. Together, they identified the potential to fine-tune the multiphase algorithms towards a continuous monitoring system for detecting contamination in the marine fuels ecosystem through Smart Port Challenge (SPC) 2019. This innovative approach won them the top prize and the duo went on to incorporate Dravam in 2020.

Founded 2020,
Singapore

Dr Vivek Premanadhan
Co-founder & CEO

Derrick Lee
Co-founder & Director



Rethinking the Fuel Sampling Process

Fuel amounts to between 40-60% of a vessel's operational expenditure. With rising prices and increasing compliance regulations, the quality of marine fuel (bunker) is of commercial and environmental interest. Poor quality fuel can lead to asset damages, loss of hire and under more critical scenarios, endanger crew and cargo as well as lead to environmental damages.

Currently, quality is ascertained via laboratory testing of limited samples drawn during the bunker transfer process. This manual process is both time-consuming and prone to human and measurement errors. Furthermore, the quality of new and more emission-compliant blends degrade over time, making a more continuous and comprehensive approach crucial.

Dravam is rethinking the sampling process with their patented inline monitoring solution, which utilises conventional flow instrumentation coupled with ML-augmented multiphase algorithms to provide a quantitative estimate of quality. It does this by detecting contaminants and anomalies during the flow of fuel in the pipeline. This forms as an early detection and notification system which enables operators to intervene and take appropriate corrective actions during different stages.

Through their journey in PIER71™ Accelerate and SPC 2019, Dravam's co-founders gained clarity on fuel quality issues from the perspectives of individual stakeholders, enabling them to refine their solution to fit the requirements of the shipping industry.



Digital and Traceable Fuel Quality Assurance

The maritime industry is in the process of transformation via automation and digitalisation, with a push towards decarbonisation. Dravam's automated fuel quality monitoring solution offers a digital and traceable evidential coverage of the bunkering operations for suppliers during loading and delivery, whilst providing an assurance to their clients.

Utilising the MPA grant that was awarded post SPC 2019, Dravam designed, fabricated and successfully installed its first pilot skid on a Singapore registered bunker tanker for Kenoil Marine Services in 2021. This is now providing 24x7 digitised insights for both loading and unloading operations. Being class certified by Bureau Veritas, the skid and ancillary systems comply with all marine and offshore safety regulations.



PIER71™'s accelerator programme led to several fruitful interactions with various segments of the industry, which not only helped better our understanding of the maritime business but also opened several potential domains for implementation of Dravam's technology. We are also very appreciative of PIER71™'s start-up community, with whom we engage constantly for advice and collaboration.

Dr Vivek Premanadhan
Co-founder & CEO

Looking Forward

Since demonstrating a positive impact on operational efficiency for bunker suppliers, Dravam has developed a new product – dRENGINE – a tool for vessel owners and vessel operators to monitor critical contamination during consumption of fuel at the ship's fueling lines, facilitating timely and appropriate intervention.

As a result of this added visibility and intervention capability, vessels operate on a higher quality of fuel. This in turn de-risks equipment failure, improves asset life and eventually improves consumption per mile with reduced carbon footprint.

Key Results



10 - 15% increase in operational efficiency



Over 500* cargo transfer operations digitally logged

* As of June 2022