



Clearing the air

BW Gas and Daewoo Shipbuilding & Marine Engineering (DSME) are working together to reduce ship emissions.

Although shipping is the most environmentally-friendly mode of transport per tonne of goods carried, there is still room for improvement. With this in mind, BW Gas and DSME are researching ways to cut down on the amount of NOx (nitrogen oxide), VOC (volatile organic compound) and CO₂ (carbon dioxide) emitted by ships.

The BW Group-initiated research is primarily conducted by DSME, with funding from BW Gas, and all results will be jointly owned. BW Gas is providing USD 2.5 million over three years, while DSME provides a comparable amount of work hours. In addition, DNV is providing input throughout the process.

REDUCING EMISSIONS

The NOx aspect of the research will be based on Selective Catalytic Reduction (SCR) systems, along with engine management technology. SCR systems are believed to currently be the best solution to remove NOx. These reduce NOx from the exhaust gas to elemental nitrogen and water vapour.

Sulphur and other substances in heavy fuel oil are known to damage the

catalyst and filter, so the development of a catalyst and filter with high resistance to SOx is necessary. With this SOx and PM resistance filter, DSME and BW Gas will develop an improved SCR system, evaluate the influences of sulphur content on the system, and estimate its endurance and economic viability.

The joint team will also aim to reduce VOC emissions during offshore oil loading and storage operations by applying emission control equipment. In the presence of ultraviolet light, VOC reacts with nitrogen oxides in the atmosphere to form tropospheric ozone, the primary component of smog, which is harmful. VOC is mainly generated during oil loading operations in terminals due to negative pressure in the pipe or tank.

DSME has studied and developed a model that guarantees positive pressure in cargo piping during the loading operation. This will fundamentally reduce the VOC flash gas generation, which is the main source for the generation of VOC. It is believed that the DSME model with a special valve and VOC suppression control system can reduce VOC generation during the loading and transportation period.

Thus, the approach is preventive rather than reactive.

CUTTING DOWN CO₂

CO₂ is the main contributor to the greenhouse effect and vessels are emitters of the gas. Removing CO₂ from vessels is complicated, costly and impractical, so the research will focus on developing a more efficient emission monitoring and control system that will provide the exact status of the emissions and possible alternative methods for their reduction.

Extensive studies and suggestions for the CO₂ emission and control in the marine environment will be carried out during the research. In addition, the research team plans to develop software and hardware for the onboard measurement and management system.

Given the existing engines and equipment used on ships, eradicating emissions entirely is not realistic. But through joint projects such as this, BW Gas hopes to find ways to reduce its environmental impact wherever possible.