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BALLAST WATER TREATMENT: APPROACHING COMPLIANCE

CHANDAN KUMAR - B.TECH - III

A global shipowner questionnaire and a series of ballast water management (BWM) system workshops conducted by ABS in December have found the industry to be trending toward compliance as regulatory deadlines near, but substantial operating challenges lay ahead.

The questionnaire, which included almost 500 vessels fitted with ballast water management systems, found the proportion of users who considered their systems to be 'inoperable' to have fallen to 6 percent, from 14 percent in a similar ABS audit from the fall of 2017.

However, the number of owner/operators that reported their systems to be 'operationally problematic' jumped to 59 percent from 29 percent; while this is a worrying trend, it also reflects the operational learning curve inherent in attempting to operate more systems.

About 35 percent of the installed BWM systems on the vessels were deemed to be operational at the time of the survey.

That said, with compliance requirements already in force for US ballast water discharges and soon to be in force for more global fleets, owners and operators are trying to gain critical experience with assorted BWM systems and the associated technologies.

Seven different types of BWM systems were examined, including those using:

- Filtration + Side-stream EC + Neutralization (used by 29 percent of respondents)
- Filtration + UV Treatment (20.7 percent)
- Ozone Treatment + Neutralization (19.9 percent)
- Filtration + Full Flow (In-line) EC + Neutralization (17.8 percent)
- Full Flow (In-line) EC (7.5 percent)
- Filtration + Chlorination via chemical addition (5 percent)
- Filtration + Deoxygenation (0.2 percent)

The questionnaire's findings, which were supported by a series of workshops conducted in New Orleans, Shanghai, Hong Kong, Singapore and Athens, included feedback from owners of bulk, gas, product, heavy-lift and vehicle carriers, as well as containerships.

The workshops shared the current best practices that support the integration of BWM systems, exploring the challenges of different technologies, ship types and sizes, operational and environmental conditions, operating frequencies, crew competencies and system-maintenance requirements.

Results varied between BWM technologies, but the feedback broadly revealed growing concerns among shipowners about: the operational reliability of the systems; operating expenses being as advertised; the availability of vendor support; the quality of associated control software; and adequate levels of crew training.

With USCG and IMO compliance deadlines looming for many shipowners, the questionnaire often exposed lengthy periods for full adoption of BWM technology, which suggests the need for owners to urgently start the BWM systems selection process, and for them to

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resist the temptation to make cost their sole criterion.

In addition to many crews being unfamiliar with the systems, the questionnaire and feedback from the seminars found widely disparate levels of technical support being offered by the systems vendors.

These findings in particular should encourage shipowners to assign at least one company engineer to participate in the systems-installation process, and to operate it as much as possible before the compliance deadline to build corporate and crew familiarity.

Owners of large fleets would also be well counseled to nominate one ship as the training platform for their fleet; more resources may have to be spent on operating and training for that ship, but it will help to build operational reliability by familiarizing other crews before they deploy.

Across all technologies, about one third of respondents were happy with the reliability of the systems they had installed, which suggests that operational reliability is a major concern for most owners.

Isolating with any certainty the predominant source of the perceived unreliability proved difficult, however, as it varied from technology to technology; certainly, post-installation vendor support had proven difficult to secure, particularly for owners domiciled outside the country of manufacture.

Other feedback suggested that the under-performance ratings for what is essentially new technology were

attributable to the skillsets of the crews operating the systems; it's noteworthy that some the highest levels of dissatisfaction came from owners whose personnel had received training on the fly during commissioning, as onboard-acceptance testing was conducted.

About 40 percent of owners considered their systems to be 'user friendly'; given that this is a subjective evaluation, it is entirely possible that any two owners could

have seen the same treatment system from opposite sides of the spectrum. But the measure does speak to overall industry comfort with the technology.

An updated 2019 report on the best practices for operation of

BWM systems is expected to capture all the key discussion items, lessons and insight shared at the workshops in the US and Asia.

Courtesy: William H.Burroghs, Senior Principal Engineer Advisory Services, ABS

CONTENTS

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LESSONS LEARNED FROM SCRUBBER INSTALLATION AND OPERATION

GOWTHAMAN.K - B.TECH - IV

At the beginning of this year, the IMO's global sulfur cap on marine fuels entered into force and shipowners who chose the SOx -scrubber pathway to compliance began the modern era of emissions reduction.

Scrubbers have been operating in marine environments for almost 30 years, so owners were not exactly entering a brave new world of technology. But any time a new technology is integra¬ted into an individ-ual vessel's operating system, lessons are learned; and these lessons create a knowledge base that operators with less experience with scrubbers can draw from.

Leading class societies have been supporting scrubber integration in the marine environment since their first application. ABS, for one, has gathered the depth of market intelligence required to help owners to improve the process of installing and operating most scrubber systems.

Lessons have been learned about everything from installation and commissioning to the most common hardware failures for operating systems, and the type of consumables that are typically needed.

In this post, we will discuss some of the key issues associated with the installation and operation of scrubbers. But for a comprehensive list, please download ABS's guide, Practical Considerations for the Installation and Operation of Exhaust Gas Cleaning Systems.

In commissioning SOx Scrubber systems, there can be challenges associated with extensive test periods, usually the result of an owner/operator having limited test plans and/or pre-commis¬sioning work. This may be relatively intuitive, but following an approved test plan and completing the pre-commissioning activities are the fastest way to avoid these problems.

Another recurrent problem we are seeing, specifically during the in fficient flowpaths for the exhaust gas and can be resolved by optimizing the flowpath and/or modifying the design of the demister, which removes liquid droplets from the vapor stream.

Below are some more symptoms that operators are experiencing, and potential solutions:

HIGH EXHAUST BACK-PRESSURE:

This is likely due to either undersized scrubbers, sharp bends in exhaust piping, water-spray resistance, or a failure of the bypass-isolation valve interlock. Ultimately, the system's design usually can be improved through simulations that identify the potential sources of back-pressure.

INTERRUPTED OPERATIONS

In the case of washwater supply, the problem can be caused by clogged filters in the supply piping. But when frequent operational interruptions become problematic, it is constructive to thoroughly examine your redundancy options. A failure mode and effect analysis can support this process.

NON-COMPLIANT PERFORMANCE

(eg., washwater pH value, SO2/ CO2 ratio): These symptoms could be due to inadequacies in the washwater, low alkalinity in the water supply or simply an ineffective water-spray pattern. Improving the overall design, a process that can be verified through the use of computation fluid dynamics modeling, and verification of alkalinity levels in the water supply may resolve the issue.

POOR RELIABILITY OF MONITORING SYSTEMS

(including instrument malfunction): These symptoms can be caused by many issues, including the simple fact that the monitoring system may not be designed for marine applications. Other possible causes include that it may not be calibrated or installed correctly. Start by ensuring that the monitoring system is approved for marine use, and then follow the manufacturer's instructions for calibration and maintenance.

"He who loves practice without theory is like the sailor who boards ship without a Rudder and compass and never knows where he may cast."

- Leonardo da vinci

HARDWARE FAILURE

When a SOx Scrubber system suffers a hardware failure there can be multiple causes. Below are some that industry-operating history suggests owner/operators may want to consider investigating when searching for solutions:

- The sampling tubing may have become clogged, preventing accurate readings of SO2/CO2 ratios in the exhaust gas
- The pressure transducers at the bottom of the pipe run may have become clogged with debris because the sensors were located in the wrong places
- The demister in the scrubber chamber may have malfunctioned due to a build-up of deposits
- Defective welds on piping system could have allowed washwater to leak
- Low-grade stainless steel (e.g. SS316 for fittings inside the scrubber chamber) may not have held up to the corrosive operating environment
- The metallic pipe section on the side shell used to discharge washwater also may be corroded
- The air pump that samples exhaust gases may not be working properly
- The scrubber's uptake damper cannot be operated in manual mode
- he mechanical seals for the washwater feed pumps may have failed
- The automation controls for printed circuit boards may have failed

MAJOR INCIDENTS CAUSING ENGINE SHUTDOWN AND DAMAGE:

History has taught the industry that most costly asset failures are the result of human error. The actions may be well-intentioned, but crews need to be fully trained to operate specific systems and to discourage any efforts to operate them in a mode that would disregard the control system, or manufacturer recommendations for upkeep.

In one recent event, a main engine stalled due to high backpressure after a scrubber by-pass damper failed to open when the scrubber uptake damper was closing. The programmable logic controller that was designed to control the interlock of the by-pass and uptake dampers had failed. Regular mainten¬ance and testing in accordance with manufacturer's instructions could have identified the problem.

The incident made clear that safety features require regular maintenance and testing in accord¬ance with the manufacturer's instructions, and that crews in charge of any system need to be familiar with basic starting procedures, such as checking damper positions and safety features.

In general, the industry has learned a lot about exhaust-gas scrubbers in the 30 years since they were first used in marine applications. The average owner may have become relatively familiar with the indivi¬dual systems they chose to use.

However, leading class societies such as ABS will have learned the lessons from many sys¬tems, and have the depth of knowledge to help owners

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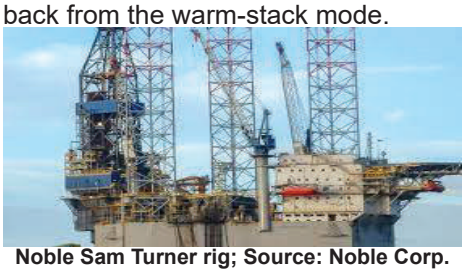
Three Noble rigs coming back from warm-stack for new gigs

VAIBHAV SHUKLA - B.TECH - IV

Offshore drilling contractor Noble Corporation has won several new contracts for its fleet of drilling rigs, which will see three of its units come back from the warm-stack mode.



Noble Sam Turner rig; Source: Noble Corp.

According to the rig owner's latest fleet status report, published on 11 March 2021, the jack-up rig Noble Sam Turner has won a two-year contract award with Total in Denmark from early March 2021 to early March 2023.

The rig was warm-stacked in the UK from September 2020 until early March 2021.

In Guyana, the contract term has been shifted between rigs under the Commercial Enabling Agreement with ExxonMobil.

Under the agreement with ExxonMobil, the drillship Noble Tom Madden will now work off Guyana until mid-December 2027.

Previously, the drillship had been awarded a contract with ExxonMobil, which would have seen it operate for Exxon from mid-February 2024 until mid-August 2030.

The Noble Sam Croft has now been scheduled to operate for ExxonMobil in Guyana from mid-April 2021 until early January 2022.

The previous agreement would have seen the rig operate for ExxonMobil from early February 2021 until early August 2021.

The rig has recently worked for Total and Apache offshore Suriname and it is scheduled to be released.

Furthermore, the Noble Don Taylor and Noble Bob Douglas drillships will both be working for ExxonMobil until late December 2022.

In Indonesia, the semi-submersible rig Noble Clyde Boudreaux has been awarded a contract with Premier Oil from early July 2021 to early November 2021.

The day rate has not been disclosed.

The rig has been warm-stacked in Malaysia since early August 2020.

In Saudi Arabia, the rig owner has agreed on a day rate adjustment with Saudi Aramco for the Noble Scott Marks jack-up rig.

For the period from 1 January 2021 through 31 December 2021, the day rate has been adjusted to $139,000 while drilling for gas and $90,000 whilew drilling for oil, after which time the day rate is scheduled to return to $159,000. The rig is under this contract until early July 2023.

In addition, the previously issued 12-month suspension notice for the Noble Roger Lewis jack-up has been rescinded by Saudi Aramco and replaced by an approximately six-week standby period for well planning and rig maintenance.

The rig worked until mid-February 2021 when the standby period began.

For the period from 1 January 2021 through 31 December 2021, the day rate has been adjusted to $139,000 while drilling for gas and $90,000 while drilling for oil, after which time the day rate is scheduled to return to $159,000.

The contract is now scheduled to end in early March 2022.

Noble Roger Lewis jack-up rig; Source: Noble Corp.

Finally, the Noble Tom Prosser jack-up rig has been awarded a contract for an estimated 270 days with Santos in Timor-Leste / Australia. The contract will start in early May 2021 and last until late January 2022.

The jack-up previously operated for ExxonMobil in Australia from January 2020 until November 2020 when it was warm-stacked.

Financial restructuring and tender increase

Noble Corp has recently emerged from Chapter 11 bankruptcy with a renewed balance sheet.

The company has now also released its financial reports for the fourth quarter of 2020 and full-year 2020.

In the report, the company said that, as a result of the financial restructuring, it had emerged with a substantially deleveraged balance sheet with less than $300 million of net debt and liquidity of over $600 million.

Noble's new capital structure includes a new $675 million revolving credit facility, of which $178 million is currently drawn, and $216 million of second-lien notes.

Also in the report, Noble posted revenues of $203 million for 4Q 2020 compared to $242 million in 3Q 2020.

Contract drilling services revenues for the fourth quarter totaled $195 million compared to $227 million in the third quarter of 2020.

The decrease in revenues was due largely to a lower day rate on the Noble Lloyd Noble and lower operating days on the Noble Tom Prosser and Noble Clyde Boudreaux in the fourth quarter.

Marketed fleet utilization was 70 per cent in the fourth quarter compared to 72 per cent in the third quarter.

Noble's net loss in the last quarter of 2020 totalled $2.8 billion compared to the loss of $51 million in 3Q 2020.

It is also worth reminding that, during the fourth quarter, the rig owner disposed of five cold-stacked rigs.

As a result, the company's contract drilling services costs for the fourth quarter were $125 million compared to $137 million in the third quarter of 2020.

The 9 per cent decline from the third quarter was primarily driven by the disposition of the five cold-stacked rigs, and lower expenses on rigs that were idle during the fourth quarter.

Commenting on the state of the offshore drilling industry, Robert W. Eifler, President and Chief Executive Officer of Noble Corporation, stated: "While our industry continues to face significant challenges, we are starting to see an increase in tender activity in various markets and expect further improvements to the extent operators remain confident in forward oil and gas prices".

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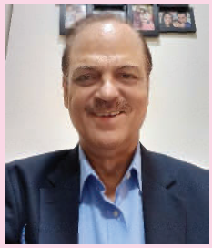

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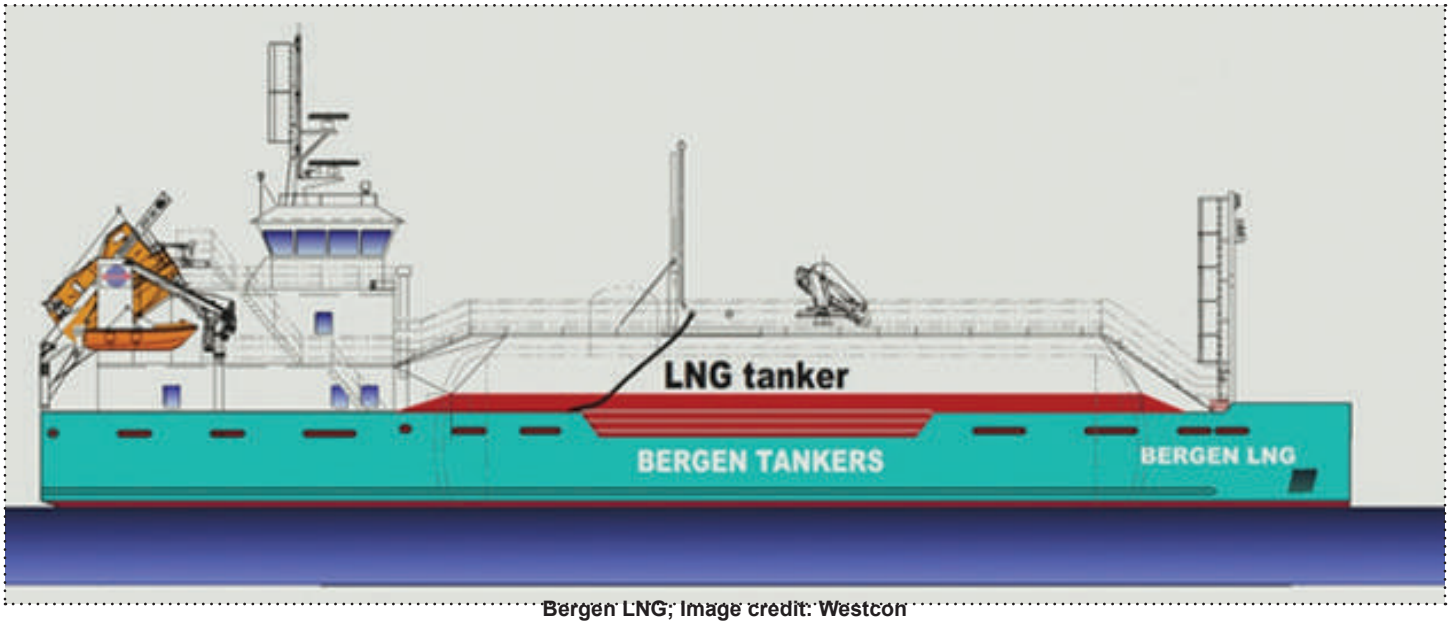
Norway's 1st LNG bunkering ship readies for gas trials

AKASH MUKHERJEE - B.TECH - III



Bergen LNG; Image credit: Westcon

Bergen LNG, Norway's first LNG bunkering ship, has been completed and is now ready for its gas trials.

The conversion project was announced back in August 2019 as part of Bergen Tankers' long-term charter with Gasnor, a part of Royal Dutch Shell.

Norwegian shipbuilder Westcon Yards was in charge of retrofitting the vessel from an existing fuel oil bunkering vessel, previously known as Oslo Tank.

Oslo Tank was originally built in St. Petersburg in 2009 and has been used as a bunkering ship for oil until this comprehensive remodeling.

Specifically, the 850-dwt ship has seen its old tank departments and superstructures removed. It has received a new cargo tank and undergone multiple pipe and electrical installations.

Maritime solutions provider Høglund was hired to deliver a cargo handling system (CHS) for the retrofit of the small bunker tanker.

Despite some Covid-19 related delays, Westcon Yards has delivered the final product and the ship left the dock in Florø on March 23.

Bergen LNG will now move forward with inspections and approvals with the customers and get started with the first test – gas trial – with LNG.

"Westcon Yards were chosen out of an overall assessment where their experience with newbuilds, great facilities with dry docks and, last but not least, the people involved, really counted for a lot. It was important for us to have a solid partner in the rebuild of this ship," Technical and Marine Manager at Bergen Tankers, **Ingemar Presthus, said.**

"The end result is a good looking, safe and efficient ship, that will have many deliveries per year. Right now, we are starting it up, first with inspections and approvals with our clients, and then for gas trial with the first delivery."

Owned by Bergen Tankers, the bunkering vessel will provide fuels to ships in the Bergen area as well as Gasnor clients.

Namely, Norwegian expedition cruise operator Hurtigruten and Gasnor signed a long-term LNG supply deal in June 2019.

Under the deal, Gasnor is to supply the company's ships along the Norwegian coast with LNG until 2030.

Bergen LNG will also deliver LNG to land facilities throughout Norway.

Because most of the operations will take place on the West Coast, its' loading dock is placed in Kollnes, Øygarden.

Two Seafarers' Centers Damaged by Hurricane Laura

Hurricane Laura, a Category 4 hurricane, left significant damage at the Stella Maris Seafarer's Center in Lake Charles, Louisiana, after it made landfall on the Texas-Louisiana border last Thursday 27 Aug 2020.

The chapel, kitchen, office and a bathroom of the doublewide are all damaged

"Half of our roof was lost," said Deacon Patrick Lapoint, director of the outreach to international seafarers at Lake Charles. "We have a doublewide trailer with a building added to it in 1995 to double the size. The chapel, kitchen, office and a bathroom of the doublewide are all damaged." Deacon Patrick showed photos of the damage on his Facebook account.

The complete doublewide will have to be removed leaving the mission with half the space. The remaining structure will have to accommodate a smaller chapel, kitchenette and bathroom, according to the center director.

The City of Port Arthur is slowly returning to regular operations after the hurricane. Citizens are urged to return only if power has been restored to their homes. The City of Port Arthur remains under a Disaster Declaration.

The Port Arthur center cares for its international shipping community

The Port Arthur center cares for its international shipping community and commercial fishers. Secretary General of the AOS-USA, Doreen Badeaux, said shrimpers secured their vessels in a relatively safe haven and took cover prior to the hurricane. However, three shrimpers died, four were in critical condition, and two are stable as a result of the misuse of a generator in a pool hall where they were staying.

Chaplain Dana Blume at the Houston International Seafarer's Center was affected far less. Ships that moved out of Port Houston prior to the hurricane are returning, but leaving at a much faster pace.

"I'm completely relieved and overjoyed," said Blume. "We had no rain, no wind and no damage. I am very thankful and grateful."