LNG as Fuel

Wärtsilä has the technology and the expertise to make a switch to LNG fuel both technically feasible and economically appealing.

Proper planning and design can ensure the safe onboard storage of low flashpoint LNG, and keep LNG hazardous zones and the drilling processes entirely separate. For additional safety, long floating hoses can be used to transfer the LNG from the bunker vessels to the tanks, while traditional and other alternative options can be addressed on a project specific basis. Wärtsilä has both the experience and know-how to recommend and advise regarding the various LNG bunkering and supply chain alternatives available.

Wärtsilä has for decades been at the forefront of gas fuelled engine technology developments. Today, the company’s cost-effective, clean and efficient gas fuelled power generation solutions can be seen around the world in both marine and land-based installations.

Wärtsilä’s dual-fuel engine technology enables the use of a variety of fuels, which can be selected according to availability, price levels and the need to comply with emissions legislation. This fuel flexibility enables, for example, the rig to be designed for an optimal combination of LNG and MGO. LNG is the primary fuel when drilling, whilst supplementary MGO provides the endurance to relocate.

Similarly, Wärtsilä Hamworthy has years of experience in cryogenic equipment, including storage tanks, process equipment, and onboard integration services. Together, these capabilities provide the partnership needed for the efficient utilisation of LNG in drilling projects, both for the fuel systems and the LNG supply chain.
INCREASING RIG AVAILABILITY

An important contribution to increasing the availability and capabilities of the rig, while also reducing the installed capacity, has been made with the introduction of Wärtsilä’s patented MV LLC Quattro power distribution system. Its immunity to failure is extremely high, and it retains good capability even in the case of a single failure. Furthermore, the transformer-less solution ensures rapid restoration of power. Importantly also, the compact system features fewer components for a lighter and less space consuming solution.

Online monitoring of the gensets and thrusters enables timely intervention before major failures occur. This markedly increases the efficiency of maintenance procedures, thereby reducing downtime.

SMOOTH, SAFE OPERATIONS

Wärtsilä offers a combination of measures that enable load fluctuations to be more effectively managed. This means that the power production, distribution and station keeping are simplified and made more reliable. The result of these combined technologies is an improvement in efficiency of as much as 30 percent. These measures include:

- Advanced control that unleashes the high precision capabilities of the drilling drive. The possibility to incorporate active heave compensation in the future further improves the drilling effectiveness. Interchangeable modules facilitate high availability.
- Removal of the need for brake resistors through the integration of batteries into the drilling supply. The use of batteries to support the power generation is well proven in practice with a system of 500 kWh at 1500 kW, and enables energy to be recovered in a useable form to help reduce fuel consumption. By removing the largest load dynamics at the source, the rest of the distribution system is stabilized, which in turn allows safe operation of the gensets at a higher average load.
- The latest and most advanced Wärtsilä thruster design to lower hydrodynamic losses resulting from interaction with the hull. By incorporating an inclined propeller shaft into the reliable design, less power is needed for station keeping regardless of weather conditions.

- Operating at a higher average engine load to enable the running of fewer engines in parallel. Wärtsilä has the know-how to overcome the conventional drawbacks related to frequency and/or voltage instability and reduced load acceptance, and has developed measures for dealing with them. Batteries can help improve frequency stability, while keeping the non-active generators spinning improves voltage stability. By having a clutch between the generator and the diesel engine, the generator can be kept spinning while the engine is shut down. The spinning generators allow additional power to be online faster.
- The latest engine technology to provide greater efficiency with less fuel consumption. The new version of the Wärtsilä 32 engine provides an optimal means of handling the low load and dynamic conditions that are typical of offshore applications. In tests performed, the effect of load variations on fuel consumption was found to be minimal (within 3 percent) for both high and low average loads. Fuel consumption in stable low load condition was also confirmed as being highly efficient.

When combining these measures with the power distribution performance of the patented Wärtsilä LLC Quattro system, and the good dynamic performance of the Wärtsilä generating sets, offshore drilling can be made cleaner and more cost-effective, while maintaining high standards of safety.