

Ensuring safe, predictable and efficient port operations can be aided with maritime meteorology systems, **Kai Vilkkö of Vaisala Oyj** explains

Weathering the storm

Intuition is a powerful tool for any experienced mariner, but today's busy and complex port operations demand far more than just this. The accurate, real-time local weather and sea-state information provided by modern maritime meteorology systems eliminates the uncertainty and risk associated with making operational decisions based on intuition alone.

Reliable local weather data and sea-state information is crucial for ensuring safety and efficiency in and around the port. Weather monitoring systems offer local real-time data collection, intuitive display software, data storage and management, and also provide access to real-time and historical weather information to all necessary parties, from ships' captains and tug masters to crane operators and mooring teams.

Mission-critical measurements

What to monitor, where, and how will depend on the characteristics of the port in question. For navigational purposes, accurate measurement of wind direction, wind speed, and visibility are critical to ensuring safety. Oceanographic measurements such as current, wave height, sea level and salinity can all form part of a modern system.

The heart of any system is the weather station, which gathers, processes, and disseminates the information from the connected measurement equipment. Offerings provide a wide range of meteorological and statistical calculation options and integrate all essential weather measurements into a single system.

In terms of oil and gas operations, and liquid natural gas (LNG) transportation in particular, severe weather – especially lightning – can present a significant safety risk when vessels are in port loading or unloading their payload. This is true not only within the harbour, but also for the surrounding area and the community at large.

This danger was brought into sharp focus in 2011, when the Malaysian-operated tanker *Bunga Alpinia* was struck at the Petronas Chemicals Methanol Sdn Bhd terminal in the South China Sea, resulting in five fatalities, a significant environmental threat to the surrounding area, and the almost total destruction of the vessel. A lightning detection system would have provided advance warning of the potential danger and could have ensured that sensitive operations were halted during the storm.

Prevention is the keyword. With a modern meteorology system in place, weather-critical operations can be carried out when conditions are optimal and halted when there is a safety risk. Lightning poses an explosion risk, and approaching storms and high winds can hamper crane operations, preventing loading and unloading. Accurate weather information and prediction ensures safety and enhances the attractiveness of the terminal



to potential customers, giving a port that extra edge in an increasingly competitive market.

The value of knowledge and experience

One of the major challenges faced by port operators when deciding to implement weather observation systems is how to gain a better understanding of the weather in relation to their specific environment. Close collaboration with a knowledgeable partner is invaluable, particularly when it comes to determining the optimal location for sensor equipment and predicting the behaviour of the potential parameters to be measured.

For oil and gas operations, and again LNG in particular, a supplier with an in-depth knowledge of electrical storm behaviour and detection, and the capability to support Ex areas (also known as hazardous locations or explosive atmospheres) is critical to ensuring safety and enabling effective planning of operations. As gas-related operations expand and become more complex, a reliable lightning detection system is fast becoming an essential tool.

Lighting services can be combined with local lightning sensors, displays, and alarms for on-site lightning detection. A comprehensive setup like this will provide early warning and tracking of thunderstorm movement.

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