

# Wireless Area Monitoring Protects Refinery Personnel Working at Heights

How do you give an early warning to people working outside at height that there is gas in the vicinity? Read on to learn about inexpensive yet effective means of providing protection to such workers which is in use at a number of large refineries in ASEAN.

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In a refinery, there may be many fractionation columns where steam is used to break down crude oil into light and heavy products. As the products need to be cooled before transport, there can be many heat exchangers that use plant water for the purpose. Plant water exiting the heat exchanger needs to be cooled again before going back into service. Therefore, in these refineries or process plants, a large cooling tower system is a common sight.

Cooling towers are tall structures (built from wood or concrete) with a large mechanical fan - the fin fan - on top. The fin fans create an upward draft which draws air up while plant water cascades down. The contact of ambient air and water facilitates heat transfer and cooled water is collected at the bottom of the tower. While the size of cooling towers varies, they must be tall for effective heat transfer.

Workers are often required to work at heights on cooling towers, as well as other tall structures. For example, when maintenance work is required on the fin fan, the worker will have to scale the height of the cooling tower to reach it. While at work, the workers may not be aware of potential gas hazards around the tower, so it is important to have monitoring and alert systems in addition to personal gas detection devices. Providing adequate



protection from gas hazards may be more difficult, but wireless temporary area monitoring is now a practical solution to this problem.

Wireless area monitoring provides a number of advantages while workers carry out a repair. The portable units can be easily deployed to provide fence line monitoring during maintenance, shutdowns or turnaround. In case of working on a cooling tower fin fan, the wireless connection between individual area monitors eliminates the trip hazards associated with cabling between non-wireless units – a particularly important feature when working at height.

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During repair work on a cooling tower fin fan, wireless area monitoring units will alert engineers working on the upper deck as soon as any gas hazards are detected on ground level and vice versa. The audible alarm and lights sequence is faster on the detector which senses the gas hazard, while the sequence on other units in the network is slower. This differentiates the unit nearest the gas from the rest, so



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everyone is alerted to the vicinity of the hazard. Furthermore, additional units can be used to relay alerts to the control room via a detector located outside. In addition to gas alert signals, some detectors will transmit other conditions e.g. loss of signal, fault, or "battery low" alarm. This modulated alert mode is usually conveyed by a specific sequence of signals, for example the beacon and lights will flash for 3 seconds followed by a 5 second pause which will be repeated until a user acknowledges the alarm. So, wireless temporary area monitoring allows for quick deployment while maintaining high level of protection for workers. Personnel working at height can be alerted to any gas hazards on the ground, or vice versa. The same alarm can be relayed to the control room by having an additional detector in the control room vicinity. This configuration is easy and does not require any additional hardware, providing refineries and processing plants with a simple yet effective solution.

### About the Author

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