

# The PID's Role in *First Response*



*A photoionization detector (PID) is a versatile tool for assessing chemical dangers at an emergency response site.*

by **Dave Kuiawa**

**W**hen a hazardous materials (hazmat) response team arrives on the scene of an accident, there are many unknowns. Whether the potential hazard originates from an overturned semi-truck on the side of a highway or a derailed tank car along a deserted stretch of track, these “first responders” need to approach each event in a calculated manner. The team focuses first on the hazard and then precisely directs the response, containment and clean-up based on this information.

## Determination of PPE

A first responder's initial concern is choosing the proper personal protective equipment (PPE). The level of protection will largely depend on the level of airborne contaminants and the hazard(s) they pose. Generally, this is determined by checking the shipping manifest or hazard placard to determine what compound could potentially be present. If the product poses a health risk, the team needs to prepare for the worst by outfitting the monitoring crew with supplied air and the appropriate level of protective suit. At this point, the monitoring can begin with the goal of determining if this potential hazard is a reality. This is accomplished by using a photoionization detector (PID) to monitor the ambient air (downwind) for parts per million (ppm) concentrations of total hydrocarbons or volatile organic compounds (VOCs) to quantify the danger.

## Perimeter Establishment

Once the situational PPE has been determined, hazmat teams need to determine if leaking materials are toxic or benign. Once this is determined, the wind direction and speed are reviewed more precisely and hydrocarbons are once again monitored using a PID to determine a safe distance from the scene to establish a control perimeter. This ensures that non-protected personnel are not put in harm's way. Perimeter monitoring needs to be performed continuously as

the wind can change along with the volatility of the leaking product.

## Containment

With the hazard potential defined and the perimeter monitored continuously, the next step is to contain the product. This should be done at the source and anywhere the product may have traveled. Stopping the leak at the source may be as simple as turning a shut-off valve or as tricky as plugging a hole on the side of a tank. If the source



**Photoionization detectors (PIDs) are gas monitors that levels of hydrocarbons down to sub-ppm levels.**

cannot be stopped, then the product must be plugged to prevent further migration of the product and sorbent material can be used to wick up product that may have escaped the dike. Understanding that sorbent material involves cost, once again the PID can be used to determine if the solution on the road next to the scene is a volatile fluid or harmless liquid.

## Cleanup and Decontamination

Once containment is achieved, the next step is the cleanup of the hazardous materials. This phase of the response also requires hydrocarbon monitoring to determine if clothing has become contaminated in the process of responding to the hazmat call.

Monitoring the total hydrocarbons out-gassing from bunker gear can provide a clear picture as to the level of decontamination that is necessary.

## Remediation

Finally, if a spill reaches the soil, remediation teams will need to monitor the ground and water sources for hydrocarbons to determine the level of encapsulation and/or remediation necessary. This action is generally left to the environmental officials and contracted remediation teams. In most instances, the first responders will be questioned as to spill and migration patterns. Using the PID to monitor any reduction in concentrations over a distance will better prepare the first responder to accurately respond to this line of questioning.

## PID: The Right Tool for the Job

Each of these gas monitoring situations can be accurately addressed through the use of a photoionization detector. PIDs are gas monitors that read parts per million (ppm) or sub-ppm levels of hydrocarbons and are ideal when the explosive hazard of a compound is outweighed by its toxicity.

In the world of hazmat response, the speed and accuracy at which hazards are quantified is of utmost importance. The PID technology combines flexibility and precision to provide the first responder with one gas monitoring tool that can be an integral part of hazard assessment, on scene, from arrival to departure.

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