Intelligent Video Solutions for Industrial Facilities
Application Brief

Who
Oil refineries, chemical plants, power generation facilities, and water utilities

What
In the past, facility perimeters were protected by the use of laser and fiber-based fence detection systems, infrared and microwave motion detectors, and acoustic sensors. The problem with all of these technologies is that they are highly susceptible to false alarms, and provide no visual confirmation as to the source of the alarm. Simply placing cameras on the perimeter and monitoring them from a central control room is not the answer, either.

Industrial facilities are geographically expansive, typically covering tens to hundreds of square acres. Thus, the number of cameras required to provide proper coverage is also typically quite large. This often means that there are more cameras than the facility’s security professionals can effectively monitor. In fact, studies have shown that operators can miss up to 95 percent of the activity in a scene in only 22 minutes of continuous monitoring. This translates into higher risk.

Why
As devastating as the September 11, 2001 attacks were, a terrorist attack against any one of literally thousands of U.S. industrial facilities could have even more catastrophic results. For example, there are nearly 825 chemical plants in the U.S. that each place 100,000 people or more at risk of serious injury or death as a result of a toxic emission. Of these 825 facilities, 123 are classified as “Tier 1,” meaning that they pose a threat to one million people or more.

Power generation facilities – especially nuclear power plants – are considered high-risk terrorist targets. Although the number of nuclear power plants represents less than one percent of the total number of power generation facilities in the U.S., they generate nearly 20 percent of nation’s power. Furthermore, more than half of these plants operate in or very near major metropolitan areas. The impact to human life and the environment if one of these facilities were to be attacked would be incalculable.

As if this weren’t enough, there are over 54,000 public and private water systems in the U.S. Experts agree that introducing a toxin into a raw water reservoir would have little impact because of the dilution effect that several million gallons of water would have on any biohazard. However, James Atkinson, noted counter-terrorism consultant, has said that “a single terrorist, or even a small group of terrorists, could quite easily cripple an entire city by simply destroying equipment at the reservoir end of the pipeline, and even by poisoning the reservoir with concentrated toxins right where the water enters the pipeline.”

So the challenge for individuals responsible for security at refineries, chemical plants, and power and water utilities is to improve perimeter monitoring and intrusion detection capabilities. Traditional methods are prone to false alarms, and large facilities contain dozens (perhaps even hundreds) of cameras that no one is watching. Instead, most video systems are used as a forensic tool to analyze an event after it has happened. Clearly a better solution is needed.

How
What is needed is a real-time, automated video intelligence solution for industrial facility surveillance. The Bosch Intelligent Video Motion Detection (IVMD) solution acts as a “virtual operator” – it analyzes incoming video and automatically detects and notifies appropriate personnel of abnormal events or potentially threatening situations.

Bosch IVMD transforms traditional video surveillance from a reactive tool to a powerful, proactive sensor. When used in conjunction with traditional perimeter sensor technologies, IVMD improves threat detection and situational awareness to enhance safety and reduce risk.
Summary

Bosch IVMD is an intelligent digital video motion solution that uses advanced video content analysis to reliably detect moving objects while suppressing false alarms. The algorithm intelligently adapts to changing lighting and environmental conditions such as rain, snow, and leaves blowing in the wind. IVMD can be easily configured to select the sensitive areas, minimum and maximum object sizes, and the motion direction that will trigger an alarm.

IVMD offers an embedded intelligent video analysis capability that runs directly on Bosch VIP-X IP video encoders and Dinion IP cameras. This allows video content analysis to be pushed out to the edge of the system, eliminating the need for costly servers, frame grabber cards, and video management software — making Bosch IVMD a very cost-effective solution.

It is ideally suited for perimeter intrusion detection in industrial environments where security operators are overwhelmed by the number of cameras, yet the frequency of events of interest is relatively low.