BP Refinery Uses RFID for Evacuation System

At its Cherry Point facility, the oil giant has deployed an ultra-wideband tracking system to keep tabs on personnel in the event of a fire or explosion.

By Claire Swedberg

June 5, 2006—BP Cherry Point, BP's oil refinery in Cherry Point, Washington, has launched an RFID personnel-tracking system. The site's "Location Aware Safety System" will be used to know the whereabouts of 2,000 staff members, contractors and visitors.

The refinery, reportedly the largest in Washington State, produces 3.5 million gallons of gasoline, 2.5 million gallons of jet fuel and 2.2 million gallons of diesel fuel each day. All employees, contractors and visitors at BP Cherry Point will wear RFID enabled badges in the refinery's processing area, tank farm and docks, allowing BP operators to determine where they are in the event of an emergency such as a fire or explosion.

BP Cherry Point will use the system to better fulfill OSHA's Process Safety Management (PSM) standard for management of hazardous chemicals, according to BP Cherry Point senior safety engineer Tim O'Neill.

"We need to be able to account for every employee in the case of an emergency," O'Neill says.

The active RFID tags in the badges allow BP to track where all its employees and visitors are and quickly determine if someone remains in the facility and identify that individual, as well as his location.

BP Cherry Point is using an IBM WebSphere software system with a custom tracking interface known as Atlas to collect data, and Multispectral Solutions RFID badges that with active ultra-wideband (6.0 GHz to 6.5 GHz) RFID tags that transmit a unique ID number every second. Each badge is a quarter inch thick, weighs 1.8 ounces and is powered by batteries expected to last about two years, says Multispectral Solutions senior vice president Rob Mulloy. The badges costs about $40 each, O'Neill says. Multispectral is also providing about 10 stationary readers, at a cost of about $150,000 apiece, as well as handheld readers.

Previously, the refinery used bar-coded ID cards to track who entered and who left the facility. It replaced them with a passive RFID badge, which could allow employees access to and from the refinery through a turnstile. The new system covers a 600,000-square-foot area broken into about eight different sections, each with a monitor that operators can use to determine who is still in that area of the facility during an emergency. Facility procedure requires that employees go to their appointed evacuation area during emergencies, but tracking them out of the facility using bar codes was cumbersome because it required each badge to be scanned individually at close range. The passive proximity badges could not be read reliably in evacuation events in which large numbers of people on foot and in vehicles move rapidly through the exit, Mulloy says. Therefore, during emergency evacuations, the refinery used a simple headcount procedure.

With the new system, readers at evacuation points should be able to capture data from every badge-wearing employee who passes through the exit gate. In addition, if someone remains in the facility, the monitor will display that person's location, and the operator can bring the cursor over that person's image to identify the

person assigned to that particular RFID badge.

The refinery ran a trial of the active RFID system at the reformer section of the facility earlier this year. It intends to increase the coverage area to about 1.5 million square feet by the third quarter of 2006.

Readers can determine where the badge wearer is within 1 foot of their true location, Mulloy says, as they stand between readers located as far as 1,000 to 1,500 feet away.

"There are certainly some technical challenges," says Mulloy, pointing out that there is considerable metal around the facility. The Multispectral system works better than most in this environment, he says, because the RFID tags transmit at short ultra-wideband bursts, enabling them to be read more reliably around metals.

"Cherry Point is very forward thinking," says O'Neill. "It's a very technologically savvy facility. They like being on the forefront and finding ways to do things better." He adds that other members of the industry may benefit from BP's research and development for this project.