# BP Tests RFID Sensor Network at U.K. Plant

The energy company seeks to determine how the technology might help it manage its chemical inventory, increase stock visibility and reinforce safe-handling business rules.

By Jonathan Collins

June 21, 2006—Last week, BP began a trial of an RFID-based sensor network. The energy provider hopes the pilot will help it better manage chemical inventory, increase stock visibility and reinforce safe-handling business rules at a petrochemical plant in the United Kingdom.

"This is next-generation RFID," says Mike Haley, a consultant in the chief technology office of BP's digital technology group, "and this is the first industrial trial of new RFID tags. Each node in the network will work collaboratively, potentially transforming business processes and creating a step change in safety and operational integrity."

During the six-week trial, BP is placing the new active RFID tags on 20 to 40 chemical containers stored at its petrochemical plant in Hull, England. The trial's goals are to learn how well the technology performs in a real-world setting, and to determine the best way to tag containers.

Developed by the CoBIs project involving collaborative business items, the tags communicate and share data with each other. In the network, each RFID sensor node, or tag, can collect data and transmit it to any other node in the network. Launched in 2004 by SAP and the University of Karlsruhe in Germany, funded by the European Commission, CoBIs is working to develop a way to embed business logic in RFID tags to link business process management more closely with what is happening in the physical world.

BP's partners on the project include Lancaster University in the United Kingdom and the University of Twente in the Netherlands. In addition, Particle Computer, a spin-off company set up by the University of Karlsruhe's Telecooperation Office (TecO) with ties to SAP's research department, will work to commercialize the project's results.

The CoBIs-developed RFID tags are designed to monitor the ambient conditions around them and provide alerts when required, according to predetermined business rules. Each tag carries an accelerometer (movement) sensor, a wireless transceiver, up to 10 kilobytes of memory and other computing components for storing and processing business rules. The tags use a proprietary peer-to-peer protocol to communicate with each other. Each node transmits not only its unique ID number but also details of its environment and content, both type and volume, to all other nodes within a 3-meter range.

These communications help determine if business rules—such as the total volume of stored chemicals allowed in this location—have been violated. In addition, they can help ensure that potentially reactive chemicals have not been stored close to each other, that storage conditions are acceptable and that shelf life has not been exceeded. If a business rule is breached, then an alarm can be raised, either on the tag (with a warning light) or in the management application software. The network of nodes communicates with a wider corporate network via base stations.

According to BP, it is essential that the company have the ability to change the business rules on each sensor tag over a network, instead of having to visit each sensor node physically to update it. "[Knowing] where each container is located and when it is being moved will help safety and business practices in BP," Haley says.