RFID JOURNAL
THE WORLD'S RFID AUTHORITY

Australian Companies Say Pallet-Tracking Project Proves RFID's Mettle

Topics/Verticals: Supply Chain, RFID Standards, Operations, More...

CHEP, P&G, ACCO and other participants used EPC Gen 2 tags to track the delivery and return of wooden pallets, achieving perfect read rates throughout the supply chain.

By Beth Bacheldor

July 9, 2007—An Australian consortium of businesses and organizations has just completed a two-month pilot-testing EPC Gen 2 RFID tags and interrogators affixed to wooden pallets. The results, the group says, prove RFID can raise productivity and efficiencies in a multi-industry supply chain.

The pilot, known as the National EPC Network Demonstrator Project Extension, was managed by GS1 Australia, a branch of the international standards-setting organization GS1, in cooperation with RMIT University in Melbourne, Australia. The purpose of the pilot, says Maria Palazzolo, CEO of GS1 Australia, was to demonstrate that "EPC/RFID isn't merely a theory that works on paper." According to Palazzolo, "If you have the right team of talented people who have some experience and know-how, supported by good software and hardware, you will find a solution and you can make RFID work in your environment."

Murray Fane, director of information systems for CHEP's Asia-Pacific division (one of the project's participants) agrees. "Good asset-management control principles require all assets to be counted and data to be entered correctly," he says. "Current supply-chain practices also involve quite a bit of paperwork, often by the sender, the receiver and the transporter. We set out to remove counting, data entry and paperwork, yet we still wanted 100 percent accuracy and integration with our ERP system. This would really make RFID live up to the promise."

CHEP provided wooden pallets for the pilot, fitted with passive EPC UHF RFID tags. Other participants included office products supplier ACCO Australia, consumer packaged goods (CPG) provider Capilano Honey, logistics provider Westgate, discount supermarket operator Franklins Australia, CPG company Procter & Gamble, supply-chain and logistics provider Linfox and CPG company MasterFoods. Service providers Telstra and Retriever Communications also contributed to the project.

Many consortium members had joined together for an earlier project, completed in June 2006 (see RFID Trial Down Under). The consortium began planning for a subsequent pilot in September 2006, and shortly before Christmas that same year, it received an A$109,500 (US$94,100) grant from the Australian government's Department of Communications, Information Technology and the Arts, as part of its Information Technology On-Line program. The pilot ran from March (the first RFID tag read was performed on March 12) through May, including more than 3,300 tagged pallets.

The tags employed in the pilot were passive EPC Gen 2 tags from Impinj. The standard used for the unique numbering of the pallets was a Global Returnable Asset Indicator (GRAI), a GS1 numbering structure for returnable assets. A Global Location Number (GLN), another GS1 numbering structure, was utilized to uniquely identify locations where handheld readers were operated.

Telstra's EPCIS-compliant Adaptive Asset Manager (AAM) software was used to manage and share the RFID data collected during the pilot, which participants were able to access via a Web interface. The data was also communicated to handheld Personal Digital Assistants (PDAs) used by CHEP truck drivers.

The frequency employed in the pilot ranged from 920 to 926 MHz (UHF), the Australian UHF RFID band, using a combination of 1 and 4 watts of radiated power (fixed readers transmitted signals of up to 4 watts of power, while the handheld scanners operated at 1 watt).

CHEP truck drivers read the tags while picking up pallets for an order (which they accessed via the PDA) and loading them onto trucks for delivery to Capilano Honey, P&G, ACCO or MasterFoods. As each pallet passed a fixed RFID reader, its tag information was sent to Telstra's AAM, then relayed via GPRS to the driver's PDA. At that point, an indicator light on the PDA software changed to yellow status, showing that pallets were being read for that order. Once all the pallets were read, matching the quantity expected for the order, the PDA indicator turned green, after which the driver departed to deliver the pallets to the customer.

Fixed RFID interrogators deployed at the customers' sites also read the tagged pallets as they were being as each block of pallets was unloaded from a truck, enabling the system to confirm individual pallets in a given block. Once again, Telstra's AAM system passed the information to the driver's PDA, which indicated a yellow status light to indicate the pallets were being read. Once all pallet tags were read, the PDA indicator turned green. If there were no discrepancies, the driver could close the order. If a discrepancy existed, says Fane, "this meant we had the ability to resolve them there and then, rather than waiting for a subsequent reconciliation process."

A returns process was also tested. Westgate retrieved empty pallets from Franklins and read their tags as they passed through its facility and were taken to CHEP's warehouse. There, the pallet tags were read once more. "The real key to success, though, was the way this data was integrated into the systems," says Fane. "Orders were entered into our system and deliveries scheduled for our trucks, and this was the last time we had any manual data entry in the process."

With accurate reads occurring 100 percent of the time, the pilot was able to demonstrate successful electronic proof of deliveries (ePODs). "Each pallet has a unique number, so you can account for every pallet individually," says Palazzolo. "This ensures that reconciliation is done to the point where you can get your full electronic proof of delivery. Instead of having to write anything down and rekey it, everything is done electronically. Proving that RFID can be used to get a 100 percent read rate is what gave us our proof of delivery—it takes away any uncertainty. It also removes the manual checking processes, so there are additional benefits around process efficiency."

The pilot participants were able to capture—and share—information at different points in the supply chain. "It gives you visibility of goods through the supply chain," Palazzolo explains, "and turns indiscriminate EPC RFID reads into business transactions."

Some of the customers in the pilot reported productivity gains of 14.3 and 22.2 percent, achieved by reducing process times, and by using ePODs rather than paper-based processes. "That's a strong saving," says Palazzolo.

CHEP estimated productivity gains of 28 percent for the entire end-to-end delivery process, Fane says. "The measured percentage gains are impressive, but do not really tell the story. We found that once we achieved 100 percent reliability, everything just became simple. There was no counting, no paperwork and no data entry, yet we had complete agreement that the pallets we sent were the pallets that arrived."

The most difficult challenge, according to Palazzolo, was achieving the 100 percent reliability. "Wanting 100 percent read rates was a great challenge to set, especially given that we'd heard previously that high 90s were doable, but not 100 percent."

Read rates were hampered by the condition of the pallets' wood, as well as their paint. The pilot used both new and used pallets, and some of the new pallets had been painted the day before the trial. "The moisture content in the new pallets was a lot higher than in the conditioned ones," Palazzolo says, "which had dried with age. So we needed to account for that as well when tuning the tags and insulating the tags from the wooden substrate. To cater to this, we used a couple of millimeters of foam on all pallets, along with foil on the newer pallets."

Once these obstacles were overcome, however, the pilot's objectives were met. "RFID really did deliver on its promise," Fane states, "even though it was only for the last few runs."