RFID Automates A-Plant's Tool-Rental Trailers

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The British company has adopted an RFID system from 4hSolutions that tracks the drills, grinders, saws and other equipment it provides to construction workers.

By Claire Swedberg

Aug. 6, 2010—In early 2010, British construction equipment rental supplier Ashtead Plant Hire Co. (A-Plant) sought a way to automate its new onsite tool-rental trailers. The new 27-foot trailers would come loaded with drills, grinders, saws and other tools required for a specific job site, and construction workers would then rent the equipment they needed, while unused tools would remain in the trailer. To manage the trailers, A-Plant wanted a system that would minimize the number of visits its own staff needed to make to construction sites, while eliminating the need to station one of its employees at the trailer to monitor the loaning of equipment, and simultaneously offering better, more affordable service to its customers by ensuring that they only pay for the tools and equipment they actually used.

"We were seeking to develop a fully automated system that would provide 24-7 access to the exact equipment needed," says Asif Latief, A-Plant's marketing director. "The whole premise was around providing remote locations for our customers, while reducing environmental impact" resulting from driving to and from stores for tool rentals. A-Plant has approximately 100 stores, located throughout the United Kingdom, where their 40,000 customers can access the equipment they need, or have it delivered to their construction sites. With a trailer (known as an Auto Hire Unit) loaded with the necessary equipment on a job site, the need to transport tools back and forth from a store would be eliminated.

Asif Latief, A-Plant's marketing director

U.K. firm 4hSolutions provides RFID-based solutions for tracking equipment use on construction sites, but the application A-Plant required was different. "They had a concept of what they wanted to do, and wanted to know what technology could do to make that happen," says Andrew Davies, 4hSolutions' sales director. A-Plant's executives not only wanted to know about each item that was removed from the trailer, and by whom, but also when something needed to be serviced. The system developed by 4hSolutions involves a passive low-frequency (LF) RFID tag attached permanently to each tool kit (a box that typically contains one tool and its associated attachments), as well as an RFID reader that snaps onto and off of the kit.

Upon arriving at the trailer, each construction worker is assigned an ID card from Paxton, containing an LF 125 kHz RFID tag. That individual swipes his or her card near a Paxton access-control RFID reader at the trailer's entrance, and the ID number is captured and sent to a PC in the trailer. Assettagz software, provided by 4hSolutions, links that ID with the individual carrying it, and that data is then transmitted to a server hosted by 4hSolutions, thereby indicating that a specific person has entered the trailer. The information is then forwarded onto A-Plant's back-end system. At the same time, the scan of the Paxton ID card at the initial door also prompts the

closed-circuit television (CCTV) positioned at that spot to begin filming. Once the individual enters and the door closes and latches, he or she then scans his or her ID card at a second reader attached to the wall beside a second doorway entering into the storage area.

The trailer is lined with shelves from which 100 plastic power strips extend, each with a snap and an LF 125 kHz RFID reader, manufactured by Elatec, attached at the end of it. Each tool kit comes with its own snap, as well as an RFID tag. When the kit is snapped into the plastic strip, the reader captures its unique ID number and sends that information to the Assettagz software running on the PC in the trailer. If the item is taken off the shelf, it must first be unsnapped from the strip. The interrogator no longer detects an ID number, and the software is thus updated to indicate that the kit has been removed. The system then knows, based on the ID card presented by that staff member when he or she entered, who has taken that tool kit.

By requiring each tool kit to be snapped into the reader, Davies says, the company ensures that the each staff member is personally responsible for the return and proper storage of that kit, rather than simply placing it on a shelf or near the trailer and assuming the system will detect it. The individual must then have his or her own tag read once more in order to exit the trailer. In the case of an emergency—there is an emergency exit that is unlocked—an audible alert is sounded if the door is opened. The Assettagz system also receives an alert if the emergency exit is opened.

Upon returning a tool kit, a construction worker can attach it to any available reader within the trailer, and the reader will capture that kit's tag ID number and forward it to the back-end system, where the software updates the kit's status as having been returned. If a worker determines that a tool kit or an item in that kit requires repair or maintenance, he can instead place the item on a quarantine shelf designated for collecting tools deemed unusable. A reader at that location captures the ID number of the tag on the kit, and the system is then updated to indicate that a kit is awaiting maintenance. When A-Plant employees then plan their visits to construction sites to service equipment, they already know which items need servicing, and how many. In that way, if a large quantity of items require servicing, the staff can be alerted to make that the next stop. If no items need to be serviced, the workers can skip that stop.

Each member of A-Plant's maintenance staff carries a Psion Teklogix Workabout Pro handheld computer with an attached 4hSolutions RFID reader that he or she can use to update data regarding the item being serviced. First, the individual reads the tool kit's RFID tag. The handheld, which stores data about each ID number and the kit to which it is linked, then provides a series of drop-down menu prompts that the employee selects while proceeding through the maintenance or repair process.

One customer benefit results from having greater visibility into which tools are being utilized. Traditionally, construction companies are billed for all tools in the trailer, whether or not they are used. A-Plant chose to employ the system to change that policy. Because the system knows what has been checked out, at what time and for how long, the firm invoices the end user accordingly. If a tool is not used, it is not invoiced. If it remains in the trailer for many months without being used, however, A-Plant

may bill for the depreciated value—which, Davies notes, is considerably less than the cost of renting it.

Moreover, if A-Plant finds that a piece of equipment is missing or has been damaged, the company can bill the customer, who can then, in turn, determine which worker last had that piece of equipment when it became broken or went missing.

Initially, A-Plant has begun providing the 27-foot trailers to several of its customers, though Latief indicates that the trailers could eventually be provided to several hundred sites.