

A.S. Shipping Agencies applies reusable EPC Gen 2 passive tags to shipping containers, enabling the firm to track the location of freight throughout its 60-acre yard.

By Dave Friedlos

Oct. 1, 2009—A.S. Shipping Agencies, a container freight station operator based in Chennai, India, is combining radio frequency identification with GPS and GPRS technologies to track containers throughout its storage yard, located 16 kilometers (10 miles) from the Port of Chennai. The company, which is part of the [Greenways Group](#), claims it is the first in India to deploy a real-time container tracking and monitoring system, and indicates it has reduced the time spent searching for containers from as much as 24 hours to just a few minutes.

According to Karan Thakkar, A.S Shipping's import executive, it was becoming increasingly difficult to manually locate containers, because the freight station covers almost 60 acres. The containers were stacked up to seven high, and remained at the yard for an average of seven days. They could be moved many times and, after multiple movements, could be far from their original position.

"We had tried a couple of systems, one of which was a touch-screen system," Thakkar says. "In this system, crane operators were given a small touch-screen device, and would enter the container number and the position of the container. When the container was repositioned, he would again need to enter the container number and the new position. The crane operator took almost two minutes to make entries, and at peak hours—when up to 150 containers would come in—the operator would lose a lot of time making entries. Also, when the bottom container was delivered, the container above would have to be repositioned, and the crane operator would have to reenter the position details. This was sometimes missed because of work pressures."

Some customs officials, Sukhwal says, recommended smaller container freight stations due to the ease in locating containers.

A.S Shipping approached a number of providers to demonstrate an automatic tracking solution. [N-NET Technologies](#), Thakkar says, devised a cost-effective solution that would require that the container number and RFID tag number be entered just once, after which the container position would automatically update following every movement.

The system requires RFID interrogators and antennas, as well as GPS receivers, to be mounted on cranes. N-NET Technologies' director, Chetan Sukhwal, says extensive lab-testing was conducted before rollout, to address such issues as protection from vibration, mechanical shock and power fluctuations caused during the crane's operation, the ability to send data over longer cable lengths (as the system was to be mounted at different locations on the crane), and the need to shield cables to prevent interference from external RF noise.

"A field trial was launched, during which we gained a number of insights," Sukhwal explains. "The RFID

reader design has been made more robust to withstand the occasional shocks due to striking of the crane to nearby containers, and the antenna and power cables would have to be routed very carefully to avoid damage during crane operations.

According to Sukhwai, "the boot time of the system was also one to two minutes, and the crane operators would switch off their engines frequently. After turning them back on, they immediately started moving the containers, and the movements would be lost. So we had to provide the reader with back-up power from a dedicated battery bank, so it would switch off with the crane."

Each piece of hardware was custom-designed for the application. The ultrahigh-frequency (UHF) RFID interrogator was designed based on [SkyeTek's](#) M9 module. Passive UHF tags, compliant with the EPC Gen 2 standard, were designed specifically for mounting on the metallic containers, but also had to be reusable with ease of deployment. The tags have a specially designed magnetic strip on the back, enabling the tag to stick to the container.

When a container arrives, it is weighed and its information is entered into the system. The tag is then associated with the container number and placed on the top of the container. At the stacking area, the tag data is appended with the GPS latitude and longitude information, and then transmitted to a central server database via GPRS. The container's location is then shown on a Web application.

Whenever a crane moves a container, the vehicle's RFID interrogator reads the container's tag, and its new location is automatically updated in the system without manual intervention. Once the container is ready for dispatch, the tags are removed at the exit gate, the tag is de-associated from the container number and it is ready to be used for another container.

A successful demonstration of the technology was conducted between November 2008 and January 2009, Thakkar says, after which the system was deployed across the container freight station.

Ten RFID readers and GPS units were purchased, with five installed on fixed gantries, two on mobile cranes and one on the weigh bridge; two others were kept as spares. Some 4,000 tags have been purchased to track the containers. The deployment of the hardware began in February, and was completed in just four weeks.

The system's benefits were available immediately, Thakkar reports. "First and foremost, customers now find it much easier to locate their container within the storage yard within a couple of minutes, to a maximum of five minutes," he states. "The information is made available online, so customers can get whatever information they want regarding a specific container from any part of the world. At A.S Shipping, we can also know the exact number of containers in the container freight station at any point in time, and know how many more containers we can accommodate."

Furthermore, the company can know the exact time period for which the container was stored, and bill the customer accurately. In the past, a customer would advise A.S. Shipping one day in advance of

Chennai Container Yard Finds RFID Sharply Boosts Productivity

Topics/Verticals: [Inventory/Warehouse Management](#), [EPC Technology](#), [More...](#)

collecting a container, and would then make payment. However, instead of the customer taking delivery the following day, it might not take possession for up to five days due to truck availability or other problems. This would result in lost revenue, Thakkar says, which can now be realized with the automatic-tracking system.

There are no plans to extend the project at present, Thakkar notes, though there are a number of possibilities for the system in the years ahead. "In the future, we would consider extending it to integrate the technology with our billing systems," he says. "We could also implement the same system at our other container freight stations located across India."