

# U.S. Army Tests WhereNet System

The Army is testing WhereNet's real-time location system in a Pennsylvania communication equipment depot for a possible permanent deployment.

By Mary Catherine O'Connor

Jan. 11, 2005—WhereNet, a Santa Clara, Calif.-based company that uses RFID in its real-time location systems for asset tracking and inventory management in large industrial environments, has announced a one-year pilot program with the Tobyhanna Army Depot in Tobyhanna, Pa. The depot is part of the U.S. Army Communications-Electronics Command and is a full-service repair, overhaul and fabrication facility of the U.S. Army's surveillance and radar systems, which include a range of devices from handheld radios to large satellite communications systems.

The U.S. Army is conducting the pilot project to evaluate WhereNet's real-time location system as a means to streamline the process of overhauling of the U.S. Army's radar antenna systems. The systems are sent to the Tobyhanna facility for refurbishment about every five years. Each system is disassembled, repaired and tested before being returned to use, which can take 12 to 15 months, according to WhereNet. Tobyhanna's goals are to use the WhereNet system to automate the tracking of individual parts and assemblies of radar systems as they are refurbished in order to prevent items from being lost, make the refurbishment process more time-efficient, reduce labor costs associated with physically tracking items and lower inventory costs by providing better asset visibility.

Two U.S. Army IT personnel at Tobyhanna are maintaining the tracking system, which was installed in November. The system is configured to record when tagged items arrive in a monitored area, how long they remain there, and when they are removed from that area. It can also be used to find specific items or send alerts when tagged items remain stationary for a designated amount of time. This data can be used to analyze work-in-process flow and prevent bottlenecks in the refurbishment process. According to WhereNet, early feedback from Tobyhanna on the effectiveness of the system has been positive.

Matt Armanino, WhereNet senior vice president of corporate development, says that if the results of the yearlong pilot are positive, the U.S. Army could make the deployment permanent and also expand the technology to track assets throughout the Tobyhanna plant. The current pilot project is deployed in several indoor and outdoor portions of the facility, an area which Armanino says covers nearly half of the 2-million-square-foot facility.

For the pilot project, WhereNet's active, 2.4 GHz tags, called WhereTags, are being attached either directly to large antenna components, such as a radar dish, or to containers used to transport assemblies or subassemblies of small items that are deconstructed for refurbishment. The tags transmit a 32-bit unique ID number, as well as 12 bytes of supplementary data determined by Tobyhanna personnel, and are associated in a database with the assets to which they are attached. The tags have a typical indoor read range of 350 feet. WhereLAN location sensors, which act as RFID readers and also measures the arrival time of the signal from the tag, relay the tag data, either wirelessly via an 802.11b Wi-Fi infrastructure or via standard Ethernet cables, to WhereNet's Visibility Server Software. This software processes the RFID data and uses an algorithm to

calculate the distance of a tag from at least two sensors. The software also graphically represents the locations of the tags within the facility. Assets are located to within 10 feet.

For the Tobyhanna installation, the tags are programmed to transmit at infrequent intervals in order to conserve battery strength, and it is possible that a tag could be asleep, or not transmitting, while it passes through a doorway or other important threshold in the assembly process. To make sure this doesn't happen, WherePort exciters are placed in doorways and other important thresholds in the refurbishment areas in the Tobyhanna facility. The WhereTags are preprogrammed to transmit their data more frequently when they enter the electromagnetic field (configurable from 3 to 20 feet) formed by the WherePort devices. The tag data is then read by the WhereLAN location sensors and sent to the Visibility Server Software.

This is WhereNet's first announced project with the U.S. Army, but Armanino says this is one of several DOD and homeland security initiatives in which WhereNet is engaged. Most WhereNet clients are transportation/logistics or automotive companies, but Armanino says the U.S. Army installation was similar in many ways to what WhereNet has seen in the commercial sector. "There are a lot of parallels in terms of the problems that folks at an army depot are experiencing day-to-day and [the problems experienced at] a company like Ford, General Motors or BMW or other environments that we've been in. There are the same goals of better managing physical assets and having better visibility of what they have and where it is, so that they can improve their operational efficiency and cut costs," he says.

Another similarity between the Tobyhanna project and other tracking projects that WhereNet has tackled is a high amount of metallic content in the assets being tracked. Metallic materials can interfere with radio frequency transmissions by reflecting radio signals. This is a significant problem in locating systems that rely on signal strength to pinpoint the location of a transponder within a monitored area. Rather than using signal strength to determine location, says Armanino, the WhereNet Visibility Software Server uses an algorithm to determine the amount of time it takes for a signal to travel from a WhereTAG to multiple (at least 2) WhereNet location sensors.

Other wireless communication systems also pose RF interference problems. But because WhereTags operated at such extremely low power, as low as 2 milliwatts, there is no interference problems between WhereTags and other communication systems at the Tobyhanna plant, says Armanino.

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