



## Tobyhanna Army Depot

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— Ronald Rains,  
AIT coordinator, Research and Analysis  
Division, Tobyhanna Army Depot

About every five years, radar antenna systems need to be refurbished. The systems are shipped to the Tobyhanna depot, where each system is disassembled, repaired, and tested before being shipped out to the field again, a labor-intensive process that can take 12-15 months. With assemblies, subassemblies, components, and spare parts spread across the more than 2 million square foot refurbishment areas, Tobyhanna's Research and Analysis Division wanted to automate the tracking of items as they moved through the repair process. Because bar coding technology would require human interaction and has the potential for human error, it was not a good fit. Tobyhanna conducted a competitive procurement of RFID solutions, and ultimately selected WhereNet's locatable active RFID, Real Time Locating System (RTLS) technology.

Using the WhereNet system's streamlined process, Tobyhanna personnel in a prime work center inducted an item into the shop when it is received, inventorying the system, and inspecting all of the components to determine what types of repairs need to be made. The items that need to be repaired are grouped together or palletized, then an active RFID WhereTag™ transmitter is assigned to those items.

### WHERE TAG QUICKLY LOCATES THE PRECISE LOCATION OF ITEMS TO PREVENT BOTTLENECKS

WhereTag transmitters are attached to items ranging from components to complete systems. The wireless architecture consists of WhereLAN™ locating sensors and WherePort™ devices, which trigger each WhereTag to emit a signal when entering or leaving a specific work center. Because the WhereNet system automatically records information such as arrival, dwell, and departure time without any human intervention, the depot personnel can quickly find the precise whereabouts and status of each tagged item at any stage during the refurbishing process, and easily analyze work-in-process flow and prevent bottlenecks. The tags, which have a 2.4 GHz signal, have a read range of 350 feet indoors and 1000 feet outdoors. If a tracked item sits in a work center longer than the allotted time, the system automatically triggers an email alert, enabling depot personnel to take corrective action. In addition, the RTLS system can be used to flag components that are left outside beyond a standard, enabling them to be moved to prevent rust and corrosion.

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said Ronald Rains, AIT coordinator, Research and Analysis Division, Tobyhanna Army Depot.

#### Business results:

- Automatically records information such as arrival, dwell, and departure time without any human intervention
- Quickly find the precise whereabouts and status of each tagged item at any stage during the refurbishing process
- Easily analyze work-in-process flow and prevent bottlenecks
- Save more than \$450,000 annually using the pilot system for just the AN/TRC-170 and AN/TPS-75 systems
- Obtain a complete return on initial investment in just over 11 months
- Save more than 837 Repair Cycle Days (RCT) annually
- Dramatically expedite the refurbishment process
- Reduce cost
- Achieve near real-time visibility of more than 85 percent of the dollar value of the test measurement and diagnostic equipment

#### WhereNet products:

- WhereTag
- WhereLan
- WherePort

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## **VIEW AND TRACK WORK IN PROGRESS WITH WHERENET SYSTEM**

Tobyhanna initially deployed the WhereNet system in late 2005 to optimize the refurbishment of the AN/TRC-170 Microwave Communications System and AN/ TPS-75 Tactical Radar System. WhereNet’s RTLS technology provides each work center with visibility of the AN/TRC-170 and AN/TPS-75 system’s work in process. A research team from the Naval Post Graduate School conducted an assessment in 2005 that revealed the following benefits:

- The pilot system for just the AN/TRC-170 and AN/TPS-75 systems will save more than \$450,000 annually, obtaining a complete return on its initial investment in just over 11 months.
- Annual savings of over 837 Repair Cycle Days (RCT).
- The system will dramatically expedite the refurbishment process, as each AN/TPS-75 will make it to the field 35 days sooner, and each AN/TRC-170 system will make it to the field 10 days sooner (35% and 8% time savings, respectively.)

Based on the success of the pilot, in January 2006, Tobyhanna expanded its use of the WhereNet system to locate parts and optimize the refurbishment of the Army’s Firefinder radar system, which detects and tracks enemy mortar and artillery shells and has seen heavy use in Afghanistan and Iraq. Firefinder is Tobyhanna’s largest project and undergoes constant upgrades; WhereNet’s involvement in the refurbishment process is mission critical, and the system must perform at the highest level (“five nines”) of reliability. In addition to tracking work in process, the Firefinder team makes extensive use of data captured by WhereNet to “lean out” their processes and improve production.

Facility personnel – employees and supervisors alike - have embraced the new technology, which makes their jobs easier and enables them to better support the depot’s mission.

Managers for four additional overhaul programs have started using the WhereNet system. Tobyhanna anticipates adding more in FY-2007.

## **MANAGE CAPITAL EQUIPMENT WITH WHERENET SYSTEM**

Maintaining calibrated test measurement and diagnostic equipment (TMDE) is critical to the Tobyhanna mission as almost 5,500 items are deployed to the work areas. Tobyhanna has decided to initially tag TMDE items with an acquisition cost of \$5,000 or greater (which amounts to 1800 items). Through the WhereNet system, the depot will achieve near real-time visibility of more than 85 percent of the dollar value of the TMDE. The Directorate of Public Works is also leveraging the WhereNet coverage. Engineers are tagging mobile equipment like pallet jacks and man lifts, facilitating the distributed staging of equipment in the depot leading to faster response time and reduced time spent moving equipment for centralized management.

## **WHERENET SOLUTION REDUCES COST**

A second Naval Postgraduate School paper titled “RTLS and the Sources of Cost Savings: A Study of How the Implementation of Real Time Location Systems into Key Business Processes Leads to Realized Cost Savings, and What This Means for the Department of Defense” real-time was completed in June 2006. The authors stated that the WhereNet RTLS, alongside ongoing lean business processes, will yield annual savings of nearly \$8 million for fiscal year 2006, with system maintenance costs less than 7.5% of the savings amount.

## **WHERENET SYSTEM COMPLEMENTS PROCESS IMPROVEMENT**

The WhereNet system complements the continuous process improvement embraced by Tobyhanna. The TPS-75 production line was awarded a Shingo prize in 2006, and both the TRC-170 and Firefinder programs have been selected for submission in 2007.

The Tobyhanna deployment is just one of several DOD and homeland security initiatives that WhereNet is currently engaged in with the federal government. The daily logistics challenges facing the DOD are not unlike those encountered by dozens of WhereNet private enterprise customers. As we have proven with those customers, WhereNet is ideal for providing location-based solutions that automate and optimize time-critical, labor-intensive processes in high-volume, high-velocity industrial environments.

## SUCCESS STORY

### CUSTOMER CASE STUDY



#### **Best Manufacturing Practices July 2006 Automatic Identification Technology**

Tobyhanna Army Depot successfully implemented automatic identification technology and radio frequency identification technology to locate disassembled parts at various stages of the refurbishing process. Automatic Identification technology provides 100% real-time visibility of assets, easily locates parts when required, and enables the depot to effectively monitor the progress of tagged systems in process, resulting in more than \$450,000 in projected annual savings.



**THE  
SHINGO  
PRIZE**  
for OPERATIONAL  
EXCELLENCE

#### **Shingo Prize for Excellence in Manufacturing 2006 Bronze recipient**

AN/TPS-75 Radar Systems, Tobyhanna Army Depot, Tobyhanna, PA

For 18 years, the Shingo Prize for Excellence in Manufacturing has honored businesses and researchers through North America's premiere manufacturing award program. The Prize highlights the value of using and expanding the body of ideas and lean/world-class manufacturing practices by offering the Shingo Prize in two categories: business and research.



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