

Damage Prevention via RFID Technology

By Thell Gillis

Large investor-owned utilities, many city municipals, electric cooperatives, water and waste water organizations are beginning to utilize Radio Frequency Identification (RFID) technology as a means to improve field operations. The goal of any technology purchase should be that the tools deployed actually increase asset management efficiency in the field and streamline operations between the office and workers in the field. This article, however, points out that, unless careful considerations are addressed in the evaluation process, success is far from guaranteed.

In the Trenches

Often, field workers encounter an “isolated island” syndrome: once out of the office, their ability to effectively communicate with other fieldworkers and headquarters can be limited without suitable tools that enable them to provide and gather crucial information about job status, construction or equipment location in real-time. Technology can play a role in bridging worker islands, making the flow of information seamless.

This challenge can't be tackled effectively without first asking key questions about expectations your organization has of a planned RFID solution. These includes:

- Where and when does this solution need to work?
- What tasks will be completed using this technology?
- How harsh is the work environment?
- Does information need to be captured and sent in real-time?
- Who will be using the technology?

The purpose of these (and other) questions is to ensure that project managers and IT work together, with their employees in the field, to identify and deliver a solution tailored to expectations. All too often projects fail due to decisions made from afar, resulting in the deployment of technology that falls short of the goals expected.

Where is Your Tag?

When determining the right RFID solution, project managers and IT decision makers are faced with a complicated task, as there's no product that suits every work environment. And when the technology is deployed in the field and isn't optimized for harsh working environments, it leads to frequent failures, decreasing employee efficiency and increasing down-time.

Still, even when evaluating RFID, it's important to note distinctions between levels of passive and non-passive, 6 to 8 feet or beyond 12 feet. There's a limited amount of products available on the market today making claims about depth, accuracy and reliability. This is because the rise of RFID technology options has created asset management and damage prevention increasingly on the move.

Durability Counts

How long should your RFID tag last? When making an investment, you want to make sure you achieve a high return on investment and low total cost of ownership. To keep RFID tags running with minimum down-time, they need to be built from the ground up to perform in environments in which you expect them to operate.



Many utilities, municipalities and water companies are beginning to use Radio Frequency Identification as a means to improve field operations.

To prevent downtime while in the field, battery life is critically important. Look for solutions that offer 12–25 years of battery life on a single charge.

Once you've determined the environment and the product's durability requirements, you can turn your attention to evaluating options for wireless connectivity. Here again, the choices are many and the benefits can be great, assuming you take a holistic view of your goals.

Where is the Job Site?

When field workers are remote and nowhere near a “hot spot,” having a GPS equipped

with Wide Area Wireless (or mobile broadband) is considered important. This means that the wireless technology enables the laptop to connect to digital cellular networks, delivering solid connection speeds. Embedded wireless systems work best and are less susceptible to damage, so look for laptop providers that offer a built-in wireless receiver.

For those field workers who spend a lot of time driving between sites, consider embedding a GPS (global positioning system) receiver. This will help your workforce cut down drive times, resulting in the added benefit of reduced fuel consumption, and also enable them to more quickly locate your assets in the field.

However the customer should always try the integrations in a real world environment prior to purchasing. For example: What level of accuracy is required by the GPS and what application will it interface with or what type of data needs to be communicated back to the office?

It's Worth the Time

The first assessment should be the capabilities of the workforce to accept, embrace, use and understand the technology. Innovation like this cannot be forced onto the field workers. Representatives from the field should be included from the beginning of the project. System analysts should seek out worker feedback, study the workflow from the field perspective and implement design concepts that guarantee buy in from all stakeholders.

As you see, there are many questions you need to ask before making your RFID technology purchase. Once you place reliable solutions in the hands of field workers, you will immediately enhance asset management, streamline processes and enable the entire workforce to have access to real-time activity. Most importantly, the company will be able to communicate effectively or flag any unexpected issues, transforming these individuals from isolated islands into a well-oiled machine, reducing errors and increasing overall staff productivity. **UF**

Thell Gillis provides support to Orbit Eagle LLC for their patented RFID Technology.

Focus on the Past



What happened to Witten Technologies, the company behind the device behind the truck on this 2002 cover of *Underground Focus*? Speaking of the device's role at the World Trade

Center site, Consolidated Edison's Director of Research and Development, Arthur Kressner said, "We've been learning ways to efficiently share corrected maps among the parties involved. We're getting more complete information and that is minimizing the amount of digging needed to verify radar data."

Back then, Witten's multi-channel GPR trailer seemed poised to take the world of underground utility locating by storm. Another article in this issue describes a collaborative effort between Witten, the Electric Power Research Institute, Schlumberger, and GRI (a predecessor organization to the Gas Technology Institute) to produce Computer-Assisted Radar Tomography, or CART. CART combined ground penetrating radar scans with imaging algorithms to produce a precise 3-D map of an underground site.

Late last fall, *Underground Focus* got this e-mail:

We have a CART System from Willtech that is mounted on a John Deere that will be going to public Auction on November 28th. Auction will take place in Titusville, FL, 10:00 am with inspection at 8:00 am Auction day.

Thank You,
Cliff Shuler Auctioneers
& Liquidators, Inc

That's kind of a sad legacy for what seemed to be such "can't miss" technology. What went wrong? What were the internal and external factors that conspired to deal Witten a fatal blow? What could other companies developing new technology for detecting and mapping underground

utilities learn from Witten's story? Or are they heading down the same path?

From the May/June 2002 *Underground Focus*, excerpts from an article by Patrick S. Holmes:

Stakeholders beware and take note! On April 22, 2002, the FCC published new rules that severely restrict ultra-wideband (UWB) transmission systems. Do you wonder how this impacts you? This ruling is a significant blow to emerging technologies that would benefit all damage prevention stakeholders, specifically concerning the development and use of ground penetrating radar for detection of buried utilities.

How do the new FCC rules affect the use of GPR by damage prevention stakeholders? First, new emission standards have been set that are considerably more restrictive than those currently in place. While some existing units can comply with these new standards, other existing and developing units will not, limiting the tools available to utility locators. Second, all GPR systems with a "center frequency" between 960 MHz and 3.1 GHz will be banned. Third, authorized users will be limited to law enforcement, fire and rescue organizations, scientific research institutions, construction companies, and mining companies. Engineering firms, utility locating companies, municipalities, utility companies and geophysical service companies are explicitly excluded.

From the smallest to the largest of stakeholders, the multiple benefits offered by GPR makes it important that all become active to find out how their businesses can best use this technology. Understanding the positive results that GPR technologies can offer in their specific industry role should be the foundation of their support and encouragement for the full, unrestricted development of GRP technologies.

On May 16th, 2002, the FCC placed in the Federal Register the Proposed Rule Changes to Part 15 of the Commissions Rules regarding UWB devices. The rules have now been published and barring any changes, petitions, or retractions, they will become effective on July 15, 2002.