

What current challenges is the Industrial Gas Cylinder industry facing?

- In a plant, information on a cylinder must be read, written and entered into a tracking system three times during receiving, filling and shipping. Currently, this is done manually.
- Reading, writing and entering cylinder data takes up much of workers time and is a major bottleneck for efficient operations.
- Five to 10 percent of manual entries are usually incorrect due to transcription and transposition errors. This error-prone process is repeated multiple times during receiving, filling, shipping and tracking.
- During distribution, workers delivering a mixed load of cylinders for multiple customers may inadvertently deliver the wrong cylinder to the wrong customer.
- During cylinder pickup from customers, workers may accidentally pick up cylinders that look like they belong to a company, but in reality, do not.
- During one shift as many as 1,000 cylinders may be on a receiving dock, causing a production bottleneck.
- Data entry errors occur due to illegible handwriting, unreadable numbers, transcription and transposition errors, and difficulty reading numbers in poor lighting conditions.
- The lack of conveyor belts to move cylinders from one location to another slows the production process.

How can RFID and Mobile Technologies help my business and my people?

- An automated RFID system increases the efficiency of data entry into the tracking system by 80 percent, eliminating manual methods (reading, writing, data entry).
- An RFID system provides 100 percent data accuracy, eliminating the 5 to 10 percent of errors associated with the data entry process due to transcription and transposition.
- Faster processing removes receiving dock bottleneck during peak time.
- An RFID system provides 15 percent decrease in turnaround time for each cylinder for the complete production cycle.
- Labor costs associated with receiving and shipping cylinders are reduced by 33 percent.
- Using the handheld RFID reader for distribution and pickup helps the delivery person to provide a faster and accurate delivery, intelligent pickup and mark damaged cylinders in the customer's presence.
- Poor visibility is no longer an issue.

- Fast physical inventory of cylinders in the plant without interrupting production.
- Tags can be read even when not in line of sight or through paint, grime or poor visibility.
- TRAKAID RFID system provides companies with more than 50 reports to run and manage their businesses efficiently.

What is RFID?

In Radio Frequency Identification (RFID) technology, an RFID reader is a radio signal initiator and receiver that listens to signals sent from RFID passive tags. RFID technology helps increase data identification, acquisition efficiency and data integrity, which helps to lower the total cost of an operation. Unlike bar code technology, which requires line of sight (LOS), an RFID tag does not need to be seen to be read or written. Even an RFID tag covered in dirt can be read. RFID tags offer a reading range from few centimeters to meters.

Multiple tags can be read simultaneously with RFID technology. When the trigger on the RFID reader is pulled, all the tags that can respond to the radio energy emitted by the reader are read. RFID tags are small in size and have no moving parts. They are embedded in protective material based high impact resistant case and have a multi-year lifespan. Tags may be placed in extreme environments and withstand rough handling.

What are EPC Standards?

EPCglobal is leading the development of industry-driven standards for the Electronic Product Code™ (EPC) to support the use of Radio Frequency Identification (RFID) in today's fast-moving, information rich, trading networks. Commonly known as the "Gen 2" standard, this standard defines the physical and logical requirements for a passive-backscatter, interrogator-talks-first (ITF) radio-frequency identification (RFID) system. One of the standards defines requirements for operating in the 860 MHz - 960 MHz frequency (commonly known as UHF) range. The system comprises Interrogators (also known as Readers), and Tags (also known as Labels). UHF is the recommended frequency for goods and asset inventory management.

What type of RFID tag should be used?

A class of RFID tags are produced with a unique identification code (UIC) or serial number from the manufacturer. This information is embedded digitally and may not be changed, making the microchips extremely resistant to counterfeiting. The combination of UIC, user data, serial number and on-board memory makes it possible to track, recall or document the life span of a single item.

TSP has developed a special curved rugged tag casing for the industrial cylinder industry based on global EPC Gen 2 standards. Ultra High Frequency (UHF) RFID is recommended for asset

and inventory management. The UHF RFID tag is encased in a long-lasting, impact proof casing and is attached to a cylinder with an epoxy/acrylic bonding agent. TSP solution for RFID reader reads the unique id of the tag. Depending on usage requirements a user may write additional information to the tag.

What information is saved on the RFID tag?

As cylinders are returnable assets, no data resides on the tag. This also reduces the operation cost: the tag does not need to be programmed every time it is used. The tag simply works as a pointer and all the information is stored in a central database or is selectively downloaded to the handheld reader.

Do Trakaid tags use active or passive RFID technology?

TRAKAID tags are passive tags, which are smaller, lighter, less expensive and more durable than active tags. Active tags are battery assisted, emit continuous signals, have larger read range and are more expensive.

Can the solution track cylinders geographically using GPS system?

The tags and the technology required for tracking cylinders using GPS technology is very costly and is not provided as a standard solution. TSP can develop custom solution incorporating these technologies.

What is Mobile technology and why is it used in CyTrack?

Mobile technology allows handheld readers to collect process and validate data, providing an instant benefit to the user by synchronizing the collected data with the main system. In most of the cylinder industry, conveyor belts are not used for moving cylinders from one process to another; the mobile RFID reader technology offers easy collection and validation of data wherever the cylinder is. Mobile technology provides for accurate customer site drop-off and intelligent pick-up of cylinders.

How are the RFID tags attached to cylinders and where are tags read?

RFID tags are attached to a cylinder with a permanent bonding agent. Primarily, tags are read on the unloading dock, production floor or the shipping dock, but may also be read anywhere in

a plant for inventory purposes. For use in distribution, cylinders may be read at the point of delivery or pickup.

What happens to the read data?

Before batches of jobs are started, the handheld reader is synchronized with the tracking system. The handheld reader scans the tag on the cylinder and the data is validated and saved on the reader. Once a job is completed, the handheld is placed on a cradle for synchronization. Synchronization is then activated and the data from the handheld reader is uploaded to the tracking system.

How is data filtered?

Filtering of the data is built in to the RFID reader software. Although a tag may be read multiple times, it will only create one record in the reader, as each tag is unique. In addition, the status of each unique cylinder is validated on the reader.

What systems is the data passed on to and how is the data used?

Once a job is completed, the handheld reader is placed on a cradle for synchronization. Synchronization is activated and data from the reader is uploaded to the tracking system. Cylinder data attached to closed jobs is processed in the tracking system which updates the cylinder inventory, billing, production and identifies cylinders for testing.

What does the Trakaid CyTrack solution do?

Four customized components comprise the solution. They were designed interact smoothly:

- The first component is the TRAKAID CyTrack Tracking system. This system helps manage and maintain cylinders, receipts, production and issues. It provides more than 50 standard reports for running day-to-day business including stock reports. The system generates delivery, empty receipts and production records. It also helps businesses manage the cylinders due for testing and service, and bills for damaged cylinders. The system generates billing for delivery and demurrage. The web based system uses the latest Microsoft technologies including Microsoft Windows 2008, Microsoft SQL Server 2008 Standard or Express, Microsoft.Net framework version 3.5. Companies with existing gas Cylinder Management Systems can easily interface with the other three customized components.

- The second component TRAKAID CyTRACK DSYNC consists of two parts:
 - First part provides interface between the handheld reader and the tracking system. This interface/bridge acts as a bridge between the existing cylinder and customer data and the data needed to connect with RFID tags attached to cylinders and the data needed to download and upload to and from the handheld reader. This allows loading the handheld reader with valid data that it then uses to instantly validate the cylinder data being read. It uses latest Microsoft technologies including Microsoft SQL Server 2008 Standard or Express and Microsoft.Net framework version 3.5.
 - Second part provides synchronization between the first part interface and the mobile handheld reader. It uses the latest Microsoft Technologies including Microsoft SQL CE version 3.51, Microsoft.Net framework version 3.5 and Microsoft Active Sync version 4.5.
- The Third component is the TRAKAID CyTrack PLANT and \ or DISTRIBUTION MOBILE that is used on the handheld RFID reader to read the RFID tag data and perform the tasks of receiving, production, shipping, inventory and tag association. It uses the latest Microsoft mobile technologies including Microsoft.Net framework for the front end, Microsoft SQL CE version 3.51 for the database backend, and Microsoft Active Sync version 4.5.
- The Fourth component is the revolutionary, curved TRAKAID RFID tags which adhere to curved surfaces. These tags are specially designed and encased in explosion proof casing for the cylinder industry. The tag has global capability across 860-960 MHz UHF band.

Must we buy all the components from TSP?

- Companies with an existing gas cylinder management system can interface very easily with TSP's other three customized components.
- TSP recommends using NORDICID \ MOTOROLA UHF RFID hand held readers. Companies may choose to buy the handheld readers from any NORDICID or Motorola distributor.
- Companies using the UHF RFID handheld reader from any other vendor should provide TSP with that reader and the software SDK and TSP will incorporate it in the solution.

How long does it take to get the system on line?

The system can go on line in one week and may take up to three weeks.

Is it possible to customize to my needs?

Yes, TSP can customize the solution to incorporate your company's work processes, numbering system and billing needs.

How do we go about contracting for the solution and what functionality is available?

Please download and complete the proposal request and e-mail it to: Trakaid@tspllc.com. Our consultant will contact you and e-mail functionality documents.

You can get in touch with TSP anytime via email or by calling our USA number: 1-203-925-8388

Who supports the solution?

TSP provides 90 day warranty and free technical support and troubleshooting via remote login.