



Why RFID Means Big Savings for the Oil & Gas Industry

WHEN A WELL OILED MACHINE RUNS DRY

Offshore oil platform in need of critical parts

Offshore oil platforms are subject to tough and demanding environmental conditions. Extreme temperature fluctuations and constant exposure to saltwater take a toll on anything on board the platform (even the platform itself). Maintaining a supply of parts to keep a platform in operation is a lifeline not only to the platform itself, but also to the refinery waiting for the next shipment of extracted crude oil to be refined into fuel for the consumer.

Part of keeping the platform in operation are steel pipes of various lengths and diameters, slings, shackles, drilling rigs, cranes and buoys. When any of these assets need to be replaced, the platform cannot operate until a new one is located and installed. Every second it takes to locate any of these items is critical, since the platform is not extracting oil.

At maintenance depots, parts are currently stocked in the order they arrive. Inventory is currently tracked by traditional "pen and paper" or barcode. Incorrect manual entry of an item and/or barcode labels that has either fallen off completely or are obscured by the harsh elements frequently, contribute to

inaccurate inventory. This makes it difficult to know exactly what inventory is on hand, and very difficult to locate the specific part that is needed.

An automatic mechanism to keep real time inventory and location of each item would dramatically reduce the time it takes to locate a critical part or determine that the part is not at the

depot so that a replacement can be ordered from the manufacturer. Any mechanism used to track these parts must not only be resistant to moisture, salt and temperatures of -60°C to +50°C [-76°F to +122°F], it must also perform on/in/near metal and at a distance of at least 20 feet to be effective.

Ensuring proper and timely maintenance of a refinery

Oil refineries contain a complex network of pipes and processing areas that must adhere to strict maintenance rules. The scope and size of an average refinery virtually makes it impossible to ensure that 100% of the refinery has been inspected and that the proper inspection protocols and audit trails are available for each area.

A mechanism to provide not only the needed audit trail, but also the ability to ensure that critical maintenance specifications would greatly reduce components that are either improperly maintained and do not meet specifications and/or reduce missing components all together during a maintenance cycle.

In addition maintenance requirements for specific parts and areas need to be readily available to the technicians performing the work and to the inspectors ensuring the work has been done. An improperly maintained refinery may cause excessive pollution and potentially an unsafe environment not only for refinery workers, but for those who live near the refinery.

Refineries contain many harsh elements, including extreme heat and caustic chemicals. Any mechanism used must have the ability to survive and perform after repeated exposure to all of these elements.

Efficient oil distribution network

As with the commodity transportation industry, the oil and gas industry also uses a network of transport trucks and tanker trailers to distribute petroleum products to retail outlets such as gasoline, diesel, heating oil and natural gas stations.

Delivery and distribution requires real time visibility to ensure all crucial processes run smoothly and efficiently. Because of the nature of the commodity being transported, distributors must strictly control their trucks and fleets to ensure delivery in order and to the proper location based on demand. If a critical shipment to a high demand area is either late or lost, the impact to

the retailer in terms of revenue and customer interruption is untold.

In addition, wide temperature fluctuations, interaction with chemicals, wind, rain, sun/UV damage and also large expanses of metal pose a challenge to any mechanism used to identify trucks and trailers. Paper labels are susceptible to damage or falling off completely due to the aforementioned elements. "Pen and paper" tracking of vehicles is susceptible to human error. A mechanism to automatically identify the time/date and destination of each vehicle would provide real-time and accurate visibility to the oil and gas distribution network.

A Well Oiled Machine

Utilizing an RTLS software system and handheld RFID readers, all existing items when located are tagged with a rugged RFID tag, such as the Xerafy Micro^x. When an item is tagged, the EPC of the tag is associated with a numeric identification code (also in the form of an affixed paper label) of the item and entered into the RTLS system. Location is noted along with quantity of each item. When an item is needed at an oil platform, a request goes

to the parts depot. Based on last known location, the parts in that particular location may be scanned and the needed part quickly located. Once the part reaches the platform, it is again scanned and a manifest generated to record exactly what has been shipped to the platform. The reverse is true is a part is removed from the platform and goes back into storage.

The ROI for the oil producer is a direct result of reduced platform downtime in the form of real-time inventory visibility, accuracy and location. Also a result is the ability for employees to perform their jobs more time effectively by not having to spend time searching for inventory.

The long term goal would be for the RFID tag to be embedded at the point of manufacture. This would eliminate manual tagging of assets and the associated cost. A tag such as the Xerafy Micro^x with the ability to be embedded into metal is an ideal solution for additional assets such as hydraulic hammers, anchors, gas bottles, drilling pipes and even the offshore vessels used to deliver parts to and from the platform.

With all key assets and process areas tagged with a rugged RFID tag such as the Xerafy Nano^x or Micro^x (depending upon size of asset), systematic and accurate maintenance and procedures for each item are at the technician and inspector's finger tips. Using a handheld RFID scanner that communicates with a central database, the following information is available:

- when Component identification and corresponding maintenance procedures
- Last maintenance date
- Maintenance required
- Next maintenance date
- Technician that performed maintenance

This enables technicians and inspectors to check all relevant information, now available as part of an automatically-maintained audit trail. This avoids government penalties and fines from improperly maintained facilities and reduces environmental pollution from potentially dangerous emissions from one or more components out of specification. Using RTLS software, a petroleum distributor is able to

effectively and efficiently keep track of its distribution network. Rugged RFID tags such as the Xerafy Micro^x attached to not only the tanker trailer, but also the tanker truck ensure that the correct truck is pulling the correct tanker trailer of product to the intended customer. When a trailer is filled, the attached tag can be encoded with the product type and destination to enable quick verification when access to a central database is not available. An IP-68 rated casing protects the Micro^x from harsh elements such as sun, wind and rain, ensuring 100% performance and reliability when it reaches its destination.

Gate mounted fixed readers as well as handheld readers used by inspection guards are able to scan both the truck and tanker before leaving the refinery. When the tanker is reloaded, tags are updated with the appropriate product information and destination. The central database is also updated accordingly for real-time shipment status.

Conclusion

The evolution of RFID has crossed multiple industries. The Oil and Gas industry have recognized the benefits and significant impact RFID has made in Supply Chain and IT industries.

“In an industry where millions of dollars are lost due to lack of equipment reliability and unpredicted failures of gears and thus downtime in production, companies have realized how RFID Technology can address such a challenge by delivering immediate ROI to the enterprise. From onshore to offshore, the technology is offering greater visibility and efficiency throughout all facets of production” says Sam Falsafi, co-founder of the Oil and Gas RFID solution consortium.

Companies such as Conoco-Philips, Saipem and BP have already begun to explore and implement RFID technology into their facilities to :

- Provide real-time and accuracy visibility to spare parts/components
- Track critical shipment of components and supplies to off-shore oil platforms
- Maintain an accurate account for all personnel who reside on off-shore platforms
- Keep strict and timely maintenance on key components the keep the entire process running

By not only tagging, but embedding RFID into critical assets, assets will have long-term and real-time visibility to an oil and gas producer. Longevity and accuracy not only provide the company with the data to maintain a complex business, but also provide the industry’s customers with the confidence that the necessary fuel to function day to day, will arrive on time, every time.

Contact Us

For more information on this application, product overview or any other questions, please contact Xerafy.