

Asset Management Takes Off

New technologies enable MROs to keep track of tools, parts, work-in-process and even people. Here's how asset management can streamline your operations. By Bob Trebilcock

Everyone understands the need for radar. When aircraft are up in the air, it's important to keep track of a carrier's most important assets. Keeping track of assets down on the ground is just as important. Knowing how much inventory you have and where it's located, after all, is a key component of supply chain management.

But while the supply chain is usually thought of as what happens outside the four walls of a repair facility or the confines of a yard, there's also a microcosm of the supply chain associated with the movement of materials from point to point in the yard, and between work stations and processes inside a repair facility or even between repair facilities.

There's also an increasing awareness that just as it is important to have the right inventory at the right place and at the right time, it's also important to have the right assets available at the right time and at the right place. Those assets might include tools, jigs, vehicles, work-in-process (WIP) or even personnel. That's why asset management enabled by RFID technology is emerging as an important tool for supply chain professionals in a variety of industry verticals, including aircraft manufacturing and MRO.

"Increasingly, the MRO industry is realizing that it's important to track the assets that are critical to service an airplane," says Amir Ben-Assa, industry solutions director for AeroScout, a provider of asset management technologies. "Whether you're talking about a tool kit, a jack or some other asset required, if the item isn't available

when you need it, there's going to be a delay in the repair." Those delays can be as costly as not having the right part available to complete a maintenance event.

However, reducing delays during maintenance events isn't the only benefit of an asset management solution. Other benefits include:

- ◆ **Process compliance:** Using asset management technology, an MRO can keep track of whether all of the steps required to complete a process have been taken or ensure that tools and equipment have been properly inspected, calibrated and stored by tying the work stations an asset has visited to a compliance program. If the asset didn't visit the work station, the compliance process probably wasn't done.
- ◆ **Better utilization:** Getting a clearer view of the number of critical assets on hand and where they're located leads to better utilization of those assets. That, in turn, allows you to keep fewer assets on hand and run a leaner operation. "When you know where things are, you need fewer of them," says Jim Caudill, senior VP of Xterprise. "An asset management solution can drive the implementation of Lean processes for an MRO."
- ◆ **Safer work environment:** Tools, vehicles and components aren't the only assets you might want to

track in a facility. Asset management also can be used to keep track of employees. "If you have five guys working inside a fuel tank, you want to know that all of them are out before you seal the tank up," says Dan Ahearn, director of business development for OATSystems, a division of Checkpoint Systems, which provides software-based RFID solutions to aerospace companies, including Airbus.

FROM RTLS TO ASSET MANAGEMENT

Just what is asset management, and why do you need it? The answer to that question has evolved over the last few years.

Initially, this segment was referred to as RTLS, an acronym that stands for real-time locating system. Simply put, RTLS is a process that uses RFID technology to track things in real or near real time.

RTLS systems work by attaching an active RFID tag to the asset an end user wants to track. That can be anything from an item as large as a lift truck in a facility or a semi-trailer in the yard to something as small as a tote or container on a shelf or the floor in a storage area. The RFID tag broadcasts a radio signal that is received by an RFID reader or a series of RFID readers. The system then analyzes the broadcast



signals and calculates the location of the RFID tag. Depending on the type of RFID technology employed, the systems can be accurate to within 10-20 ft., sufficient for locating a mobile cart, or down to less than a foot for tracking smaller items in a work cell.

Today, RTLS has evolved into asset management. The systems still keep track of the location of an asset in real time, but they also manage and monitor the status of an asset, the environmental operating and storage conditions as well as how effectively that asset is being utilized.

"The idea isn't just to know the location of an asset," says David Shannon, senior VP of product management for Savi Technology, a Lockheed Martin company. "For assets that are critical to operating a business, the question now is, 'How do you insure that the asset is also in the condition that you need it with the objective of maximizing the net return on your investment in that asset?'"

Asset management systems accomplish these new objectives by combining RFID technology with software and other technologies. For instance, in addition to an RFID tag, an asset management solution might include a sensor to monitor the operating or environmental temperature of a part that is sensitive to excessive heat or cold, or to monitor vibration, shock or humidity that might impact a part or tool.

Monitoring environmental conditions, like tracking the location of something in real time, is about the status of an asset. The information being collected by these systems is also being tied to business intelligence and analytics software to help identify bottlenecks in processes, to keep a repair process on track by managing an asset, and to track whether scheduled maintenance or calibration

was performed on a tool or part so that it's ready to be used. That allows you to operate more intelligently.

"The biggest change in asset management is that these systems are no longer about RFID," says Tim Butler, CEO of Tego, a maker of high memory RFID tags. "It's about using the technology to enable a new level of information about how you are putting your assets to work."

For example, one MRO tags parts associated with a specific tail number during disassembly, according to Savi's Shannon. The system is used to identify bottlenecks in the process by tracking parts sent back for multiple reworks. It can alert a supervisor or production manager if a part is delayed moving from one work cell to the next or if it sits in one location for too long. "By tying these parts to a tail number and a maintenance schedule you can avoid a late delivery or a late project," says Shannon.

Similarly, the asset management system can be tied to an ERP system to track hot parts that are needed in the facility to complete jobs. Hot parts arrive at the receiving dock, they can be automatically flagged in the system and directed to where they're needed.

ASSETS IN ACTION

Although the early adopters of asset management technology were in the shipping and automotive industries, commercial aviation manufacturers and MRO operators are adopting it. Here are some examples of how different RFID technologies are being used to solve operational problems, including:

- ◆ **Active RFID to track disassembled parts:** One helicopter repair

facility uses an asset management solution from Savi Technology to track the location of parts as they are removed from the aircraft. The parts are temporarily stored in a field divided into storage cells. As parts are removed, a work order for that part is placed in a pouch, along with an active RFID tag, which is fixed to the part. When the part passes through an RFID portal at a storage cell, the location is recorded on a schematic of the facility in the software. When it's time to locate the part for a repair, a worker looks up the cell location on the system schematic. Once in the cell, the worker scans the parts in that location with a handheld RFID reader to identify the actual part needed.

- ◆ **Passive RFID to track parts:**

Active tag technology is expensive—tags can cost more than \$50—but the tags can be used hundreds of times. Passive RFID tags, which are designed to be used once, cost just pennies each. One solution being implemented in an MRO facility by OATSystems places a passive RFID tag on a document, known as a traveler, that is placed inside a container or tote along with the component or part. Since passive tags do not broadcast a signal on their own, the tag is read when it passes through a building or workstation's RFID portal. "The system can still track the part because the paperwork travels with the part," says Ahearn. "And they can do it at a much lower cost than with an active tag."

- ◆ **Sensors to track environmental conditions:**

For one of its MRO customers, Aeroscout implemented a system that uses sensors to track the temperature and humidity in storage areas where canisters and other sensitive parts are stored. "Instead of sending in someone several times a week to

get a status update, the system is receiving a constant flow of data,” says Ben-Assa. “If the temperature or humidity deviates beyond a safe operating range, the system sends a real-time alert so that it can be addressed.”

NEXT STEPS

With the development of new tracking technologies, asset management systems continue to evolve. The next step is to extend the tracking capabilities to more assets and beyond the four walls of a facility as an asset moves through the supply chain—for instance, tracking repaired parts that travel between facilities, even if those facilities are located continents apart.

One new tag, for instance, combines RFID, GPS and cellular technology. Inside the four walls of a facility, the tag can be tracked using RFID infrastructure. Outside, it can speak to the same system by satellite when it’s in the yard or when a part is on a truck or ocean vessel. When it’s on an airplane, the part can continue to communicate with the system over a cellular network. In addition, the tag can detect changes in air pressure to connect with the cellular network after an airplane takes off, and then it

can connect with the satellite or RFID network when the aircraft lands.

One possible use is to track reusable jacks and transport items that may travel from one location to another with large parts, like a wing or fuselage. “We have talked to a company that wants to use the technology to track the jigs they use to transport the vertical fins for the 777,” says OATSystems’ Ahearn. “If they can’t find the jig, they can’t move the fin.”

Asset management technology also can enable worker mobility. For instance, the systems can be adapted to WiFi-enabled phones so that technicians don’t have to leave their workstations to log into a computer workstation to locate the parts or tools they might need. “These systems allow them to run a search for the part or tool they need and to receive an alert on their phone when the part has been located,” says Ben-Assa. “They don’t have to log onto a Web browser, which is an advantage if they’re on the move between buildings or up on a wing.”

Other end users are placing RFID chips in employee badges. One MRO is using the data for time and motion studies that can identify process bottlenecks; but the system also could

be used to locate employees in the building in the event of a chemical spill or unexpected hazard.

Last has been the development of high-memory RFID chips that can hold up to 32KB of configurable memory—the equivalent of a small hard drive—in a ruggedized form that will last for up to 30 years. That allows an end user or a maintenance operation to not only track the location of an asset, but to maintain the history of that asset on the RFID tag, rather than on a separate data base. “You now get a new level of visibility,” says Tego’s Butler. “You not only know where it is, but you can track how long it’s been in the field, what repairs have been done to the part over time and who performed those repairs.” There’s also room to store log books and training manuals on the part that could be accessed in the field by a technician with a standard reader.

“Now that people understand that RFID technology works, we’re really just scratching the surface of how we can use the technology to improve asset management,” says Xterprise’s Caudill. “Within the four walls of any MRO enterprise, there are opportunities.”

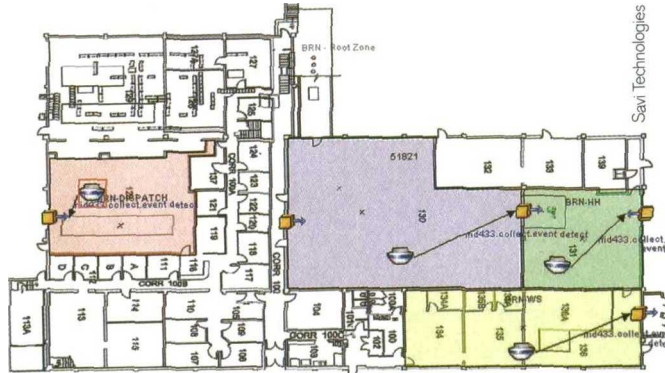


TIMCO Aviation Services tested an RFID-based safety pin program to track and manage maintenance activities and other processes.

TIMCO Aviation Services



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Savi Technology’s asset management system can track the movement of parts within a facility and identify bottlenecks in work processes by tracking parts sent back for multiple reworks and alerting supervisors to delays.

TRACKING PINS AND TOOLS AT TIMCO

As part of the normal maintenance process, aircraft safety systems such as oxygen masks and evacuation slides must be disabled to prevent accidental activation. At TIMCO Aviation Services, hundreds of preventative safety pins typically are inserted at the start of a maintenance process and then removed at the end of the job. If these pins aren’t removed at the end of the service operation, the safety equipment will not function when the aircraft is returned to service, and the flight crew will have no indication that the system is not operative.

TIMCO’s solution was an automated RFID-based asset tracking and management solution developed by Xterprise, a supplier of RFID-based solutions, that can track the movement, location and disposition of pins and critical tools during preventative maintenance and major aircraft overhaul operations.

TIMCO piloted the program on safety pins at a facility in Lake City, Fla. In the pilot, a single RFID tag was permanently affixed to each safety pin before it was inserted; at the end of the event, TIMCO maintenance technicians used a hand-held device to detect the presence of any safety pins within the aircraft. Using this solution, tools are also tagged and then tracked to monitor movement, location and disposition during aircraft maintenance. TIMCO managers can see when tools are removed and returned, thus ensuring tighter controls and more efficient project work.

Based on the success in Lake City, TIMCO expects to extend the solution to other facilities and to manage a variety of access control, quality assurance, spare parts inventory, workplace safety and regulatory compliance programs.

—BOB TREMBLE, CEO



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Learn more about the differences among real-time location systems and the five types of location tracking.