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# **The Use of RFID-based Asset Management Technology for Risk Mitigation, Improved Preparedness and Enhanced Operational Efficiencies within First Responder Organizations**

## **Introduction**

First responders face a broad array of situations daily, from massive natural disasters to minor medical incidents and from widespread theaters of operation to local community incidents. Often events require on-site rapid response and decision making in hectic environments, in which pre-planning and preparedness dictate the successful outcome and results of responder actions. These situations extend beyond the defense of property to lifesaving.

Having a full accounting for assets, inventory and equipment, before and after events, is paramount to preparation for the next event. Establishing and executing service and maintenance schedules, examining equipment condition and replenishing consumed or expired inventory, and replacing missing equipment, are all critical to effective preparedness, operational efficiency and improved performance.

A priority for first responders, particularly within fire and rescue organizations, is being prepared to react at any time to an emergency. One aspect of preparedness lies with insuring that the necessary supplies, medicine and equipment are available at all times and are in good condition, as and when needed.

Post-incident reporting and maintenance of records, files, video and data for forensic and insurance purposes are also important for risk mitigation, training, and evaluation of incident response and performance. Historically, these pre- and post-incident administrative functions have been manual, laborious and often inaccurate since they are outside of the core competency of most first responders.

For one fire and rescue organization located in Florida, the key to meeting the growing demands on resources, handling the increased pressure to control costs and enhancing operational performance was to automate its activities. The primary problems were identified by the organization and then classified into two distinct categories - supply and logistics and asset management.

## **Supply & Logistics**

Common problems were identified with equipment and inventory supply. These problems related to re-ordering and re-stocking consumable inventory such as

medical supplies, and to replacing damaged equipment and/or conducting repairs. The primary areas of concern were tied to the following logistic issues and activities:

- maintaining a central distribution center and optimizing equipment and inventory distribution
- keeping outlying fire and rescue stations appropriately supplied
- maintaining appropriate levels of crucial supplies for emergency redistribution, such as medicines and disposable bio-medical items
- ensuring that departments did not overstock inventory and subsequently overspend on non-essential items
- ensuring that the useful shelf life of such items as medicine were identified and the items replaced as necessary

The primary objective in crafting a solution for effective inventory management was determined to be “predicting what supplies will be needed in order to react to a multitude of emergencies before they happen, and having those supplies where they are needed, when they are needed.”

In addition to normal duties and responsibilities, responder organizations need to plan for unexpected emergencies and have contingency supplies available, without compromising operating budgets. A key element of such planning is to automate the collection of data regarding the status of equipment and inventory, and tying purchasing and distribution into a centralized asset management system for operational, control and budgetary optimization.

## **Asset Management**

With the Florida organization, persistent problems were identified with managing assets. These included such things as failure to conduct routine preventative maintenance on such mission critical items as jaws-of-life, which need to be serviced and checked for hydraulic leaks, and radios that periodically need to be checked for battery life in order to function properly.

Coordinating equipment check-in and check-out from a pool of centrally stored and controlled resources to ensure items are returned and in working order was often a time consuming and inaccurate process. Often configurable resources such as fire trucks were missing appropriate components such as select nozzle hoses because of oversight due to time-consuming, paper intensive manual processes.

First responders are action oriented individuals and by their nature often not focused on administrative or governance activities. As a result, activities such as securing assets, reporting on the status of equipment or inventory consumption levels, or changing needs are often not reported to or recorded with supervisors, auditors or management on a timely basis. Similarly, the lack of automated information capture and management means that equipment and inventory tracking, and reacting to demand as it shifts between facilities, is often dealt with in a tardy manner, if at all.

The Florida first responders were able to address all of the identified shortcomings, as well gain other unanticipated benefits, through the turnkey implementation of Lockwood's enterprise asset tracking and management software suite, integrated with standards-based RFID (radio frequency identification) equipment manufactured by major vendors.

### **RFID-based Asset Management Solution**

The advent of cost effective RFID data capture technologies combined with proven process and asset management software makes the goal of optimizing the use of existing assets and improving operating efficiencies immediately achievable.

The key to the solution is to use low-cost passive RFID tags. These can be placed on equipment and inventory to track their location and levels of consumption. The tags are read by electronic sensors placed at strategic locations in facilities, or by using portable readers. The embedded information on tags can then be transmitted either through USB or wirelessly to central databases for item identification, location verification and to automatically trigger predetermined actions in response to the collected information.

The benefits of using RFID in first responder environments with respect to asset and inventory management are discussed below.

### ***Operating Efficiencies and Cost Control***

Operating efficiencies and cost control revolve around optimizing the use of assets. Effective asset management, therefore, can become a critical factor in emergency preparedness, safety, accountability and controlling operating costs.

Complicating the effective use of assets is the need to continually maintain equipment and restock inventory. Locating the equipment in the first place is one issue. Maintaining a schedule of cleaning and servicing equipment, and knowing

when leased or depreciated equipment needs to be replaced is in itself another challenge.

A central theme in the solution to all these operational problems is to know where equipment is located and what the equipment is. RFID tagging with strategically located tag readers can do this. Off-the-shelf software is available that integrates in near real-time the data collected by fixed location or handheld readers with virtually all existing database programs such as Lockwood's AssetTracker or third part programs such as SAP or Oracle. As a result, no major operational changes or technology database changes are required.

Event management software, which is transparently imbedded in the RFID application, can be used in a variety of ways – from sending notification of the movement of equipment from one location to another, to sending alerts when inventory is removed from specific locations, or when stored medications are about to expire. The same capability can be used to notify supervisors or asset managers of service and cleaning schedules, and equipment replacement cycles.

### ***Oversight and Management***

There is a direct correlation between record keeping and operating efficiencies. Record keeping starts with automating information gathering regarding assets, equipment and inventory, and continues through pre-and post-incident response and subsequent incident reporting, performance evaluation and forensics.

Manual records are subject to mishandling, are frequently misplaced and often are not available to all staff who need access to them. The consequences may include the mis-supplying of medications and inventory, or poor equipment maintenance. All these issues can lead to disastrous consequences for first responders and the public, and create difficult legal, insurance and business environments for all involved.

Two applications of RFID technology improve the accuracy of record keeping, resulting in enhanced safety and responder performance. These are 1) affixing RFID tags to all equipment and inventory so that they can be tracked and easily located when needed, and 2) imbedding all appropriate information that is required related to the equipment and inventory into the RFID tags so that information can be automatically read and reconciled with electronic files related to the items.

Information that can be recorded in tags can relate to tangible items such as serial numbers and the acquisition dates of specific equipment, to intangible

assets such as electronic images, warranties, service dates, employee allocations, expiration dates or physical locations.

### ***Financial Considerations***

With the advent of wireless networking capability and advances in RFID technology, the hardware costs of systems has come down dramatically in recent years. In fact, most equipment such as laptops, antennae, fixed and portable RFID readers and network gear are now standard off-the-shelf items and can be purchased within discretionary budgets.

With the use of backend integration, and data and event management software such as Lockwood Technologies' QuickTrac system, which interfaces with existing industry standard databases, no major database program replacement is required, enabling a quick implementation of RFID asset management technologies with minimum disruption to existing operations.

Because the same hardware and backend software can be used for barcode data capture and RFID, transition from barcode technology to RFID asset management, with its dynamic asset tracking, is made seamless and remains cost effective. This capability also makes the transition to RFID modular and highly scalable.

Because the cost of purchasing integration, management and event notification software is extremely low compared to the cost of acquiring excess assets, implementation of RFID technology has an extremely high return on investment, independent of the benefits of enhanced governance and improved operational efficiencies.

***Lockwood's proprietary software fully integrates RFID and barcode data capture with existing databases. Lockwood has progressively developed its technology and products over 15 years. There are over 1,200 worldwide users of Lockwood's asset management technologies to track assets and inventories, support audits and improve operational readiness and efficiency. For further information, please visit [www.lockwoodtechnology.com](http://www.lockwoodtechnology.com)***

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