

INTERNAL USE CASE

EAM RFID SOLUTIONS



A COMPLETE SOLUTION. ENHANCING EFFICIENCY + CUSTOMER SATISFACTION.

THE COMPANY

EAM Worldwide, an OEM of aviation life vests and life rafts, operates a 56,000 square foot manufacturing facility in Miami, Florida. The space includes multiple product lines, testing areas, shipping and receiving bays and an expansive repair station.

EAM Worldwide sought a competitive advantage in 2008 through providing their clients with an ultra-efficient streamlined system for tracking inventory and obtaining accurate real-time information about their products.

EAM RFID Solutions was created in 2009 to engineer an RFID integrated system for the manufacturing, shipping and tracking of EAM Worldwide products. EAM recognized the benefits of RFID integration into its operational processes to better serve its clients with an increase in employee efficiency, improved visibility, shipping accuracy, and lowering bottom line costs.

EAM, a forward thinking company, looks beyond the “now” and formulates strategies for future success. The company has a worldwide network of authorized distributors and service facilities to provide continuous support throughout the lifecycle of their products.

THE CHALLENGE: PROCESS + PRODUCT

MANUFACTURING

EAM Worldwide’s request was two-fold. The first goal of the company was to differentiate themselves from their competitors through the efficiency of their internal processes. The company’s manufacturing process was top priority for the installation of RFID because of the direct positive impact on EAM and the client.

RFID needed to be integrated into the manufacturing process to enhance areas that had previously experienced a breakdown in consistency as a result of using manual processes, human error and insufficient traceability. A more efficient manufacturing process, improvement in process visibility, quality and shipping accuracy were needed to increase profit margins and reduce operational costs.



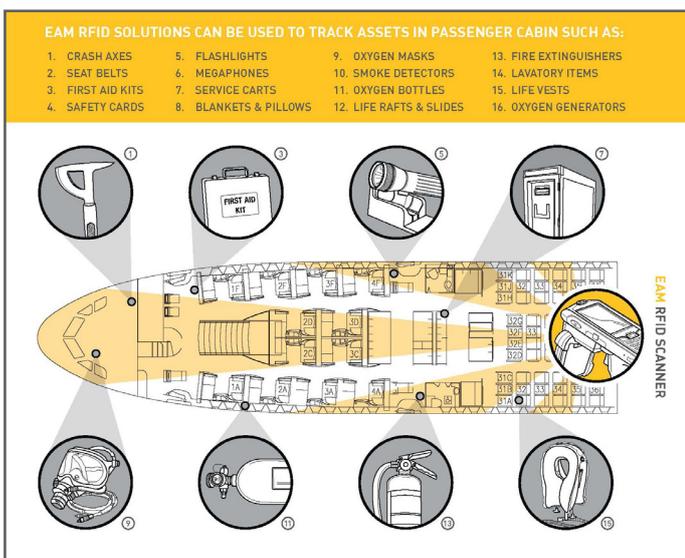
EAM Worldwide’s life vest testing area, Miami, Florida.

VEST TRACKING

The company also identified a second goal; to enable their clients in the aviation industry to utilize RFID technology through the embedding of RFID tags in EAM's life vest products. The embedded RFID tags can assist in the automation of compliance, maintenance and inventory management tasks.

FAA compliance, for example, typically requires a physical count on each seat in an aircraft to verify the existence of required life vests. Through the use of RFID-enabled vests and a hand-held scanner, an airline could verify on-board life vest inventory within seconds; streamlining the compliance audit process and improving audit accuracy [Figure 1]. Data collected on-board can be forwarded to the organization's inventory management systems where issues such as inventory losses and upcoming service requirements can be identified and addressed.

Customized RFID tags would need to be developed and their integration applied to the EAM Worldwide manufacturing process to reach the tracking goals for the company and its clients.



OBJECTIVE: COST REDUCTION + CLIENT SATISFACTION

The purpose of this project for EAM RFID Solutions was to fully integrate RFID into the manufacturing processes and vest fabrication within a period of 6 months. This included embedding RFID tags into the vests and integrating the data collection with the backend system.

The development of a unique scalable software platform that would provide users an interface for viewing their newly tracked information was required. Once installed, the new RFID system would have to seamlessly track large volumes of unique product ID and be able to routinely move a high volume of items in a limited time period while reducing the number of lost or misplaced assets.

The RFID system would be integrated with pre-existing processes to track and trace items in a way that would meet government regulations and ensure timely asset availability.

EAM Worldwide required:

- Increased visibility
- Real-time tracking
- Enhanced accuracy
- Reduction of cost of quality
- Reduction in labor time
- Improvements in tracking and traceability
- Security and verification
- A transition to paperless, eco-friendly, system

Figure 1

On-board RFID technology vest tracking can easily be utilized as a platform to track all RFID enabled cabin assets.

THE SOLUTION: REQUIREMENTS FOR A COMPLETE PACKAGE

TAGS + HARDWARE

A rugged RFID tag would need to be printed to sustain a harsh environment. Read range would be a minimum of 5 feet (1.5m) from all angles.

RFID Readers would be created with the capability to operate in high temperatures while running in high performance modes. The ranges will vary from large read zones to high accuracy read zones with a limited range.

Printers and an encoder will be needed for high-volume operations capable of high speed printing of RFID labels while simultaneously encoding the embedded RFID chip on them.

MIDDLEWARE

The system will make use of a powerful Middleware that has the ability to process the collected data according to the business rules and requirements. The middleware will need to communicate with an Oracle back-end system for data retrieval and updates. Support for RFID readers from Motorola and ThingMagic will be required, as well as the ability to adopt new devices.

USER INTERFACE

The main goal for creating the client application is to ensure that it does not overwhelm the end-user with a confusing interface. Its aim is to reduce the complexity that comes when dealing with the functionality in Auto-ID applications. The application requires an intuitive interface that feels familiar to the existing ERP system.

PRODUCT INTEGRATION

The EAM RFID Solutions software platform would be utilized internally to enhance shipping and tracking for vest and kit production. This involved development of RFID-enabled inspection stations where inspection data (inspector, date/time, and vest status) was to be captured. Each inspection station would be equipped with a reader and indicating lights. The indicating lights provide a visual cue to identify defective or damaged RFID tags, and signal the OK if the data from the RFID tag was captured and logged into the system.

The RFID-enabled carton packing station would verify that the product followed the correct process path and would ensure the right products and quantities are placed into client cartons. The required package labels, carton labels and packing slips would be printed. The packing station would also employ light and audio cues to allow the employee to verify counts and indicate packing errors.

Shipping cartons were to be scanned at the shipping dock, with an RFID-enabled dock door portal with over a 20-foot read range, allowing the company to track the serialized life vests shipped for each client order.

“The value of EAM RFID Solutions is that we have created a comprehensive RFID system, developed from our own design and build experience. We can provide our clients with the RFID hardware, software and integration expertise.”

-Eloy Leal, EAM Director of Operations and Engineering

IMPLEMENTATION STEPS

PHASE 1

Tag Commissioning

- Created an interface that retrieves product information and builds a unique Electronic Product Code [EPC] for each serialized product within a sales order.
- Created a printing module that allows user to print all RFID labels for a specific sales order.
- Updated status of sales order as labels are printed to give traceability of working sales order.
- RFID tags were attached inside the life vest to provide a tamper-proof label application.

Packing

- Eliminated manual counts and paperwork by setting up a read zone to allow packing department to scan each vest as it's placed into a box.
- Prevented uninspected vests from being packed by checking their status as they are scanned.
- Removed written paperwork by creating auto-generated packing slips identifying each vest in each carton [Figure 2].
- Status updated to "Packed" in database for traceability.

PHASE 2

Tracking

- Installed read zones under the desks of inspectors to allow them to update status of each vest as it is properly inspected.
- Updates now include who inspected the vest and when the vest was inspected; giving accountability to work efficiency and production.

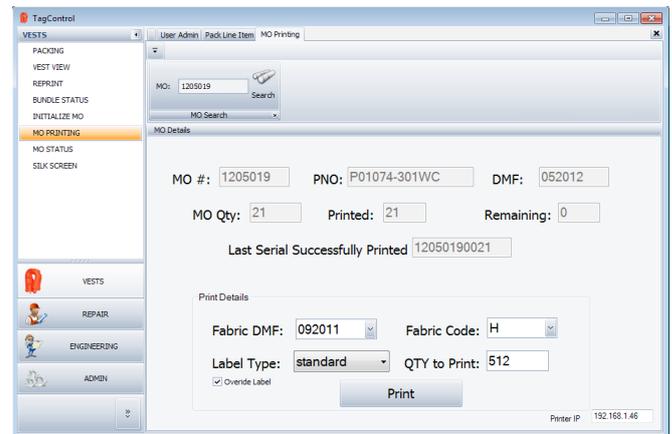


Figure 2

Interface created to integrate with Back-end system to Print labels.

Repair Track

- Create a read zone to allow production line workers to scan vests within the production line that need to be sent back for repair. This provides traceability of what was wrong with the product, what was done, who checked it in/out, and when it was done.
- Designed interface to allow any floor manager to check current status or locate any vest in repair.

PHASE 3

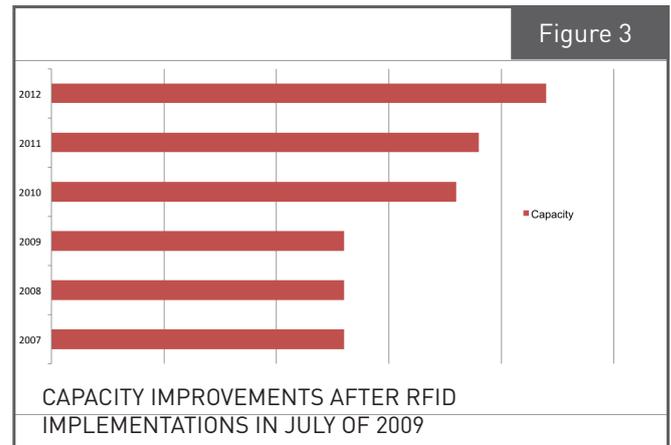
Shipping

- Created a read zone in shipping area for monitoring all cartons.
- Included notification of arrival and departure of cartons at the shipping dock.
- Installed monitor displays with up-to-date information for all cartons including the ship date and current status.
- Created alerts for cartons that are not supposed to be in the shipping area, such as cartons with a later shipping date.

BENEFITS + RESULTS: WHAT'S CHANGED?

EAM experienced decreases in production time, reduction in human errors, increase of on time delivery, and almost complete elimination of short shipments.

- Manufacturing production time of the Life Vests was reduced by **30%**.
- These savings translate to an overall increase in capacity by **60%** since 2009 [**Figure 3**].
- Cost of Quality was reduced. Miscounts and short shipments have been eliminated.
- On-time Delivery for RFID enabled products is **99.8%**.
- Better trend analysis for buying practices.
- Reduced inventory stock levels and space requirements for inventory.
- Reduced capital expenditures for holding inventory.
- Productivity has increased by **40%** [**Figure 4**]. The same number of workers can process more orders per day, driving down the cost of manufacturing.
- Errors significantly reduced through the automated capture of data and instant double-check for picking accuracy.

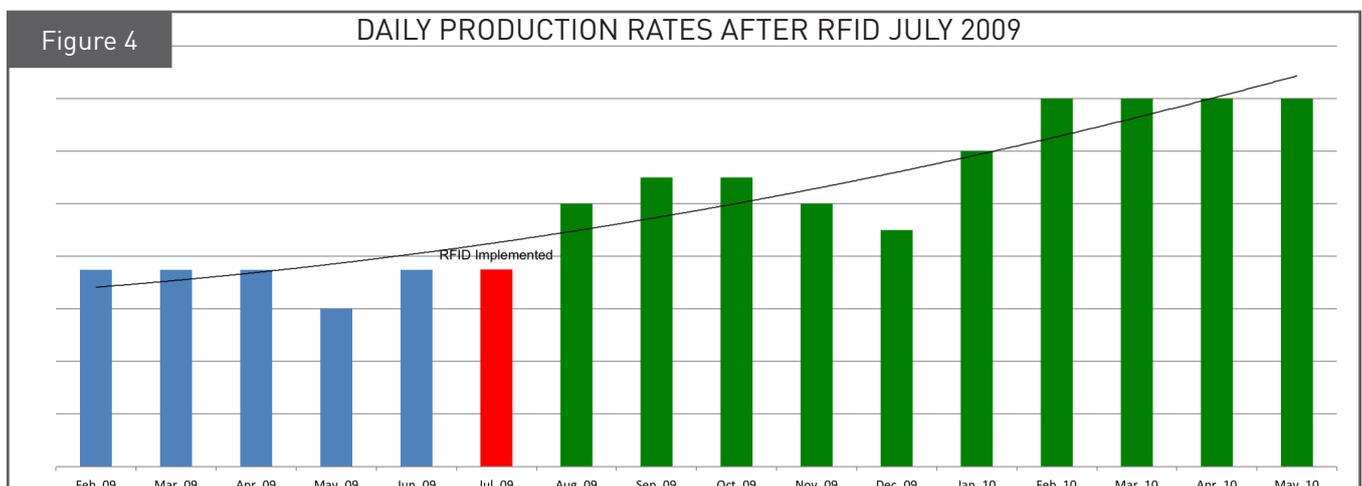


A NEW LEVEL OF TRACKING

Inspection stations can now print inspection labels automatically and update the status of products through the EAM RFID Solutions software platform.

Repair stations can also leverage the platform to check in products for repair, note products that went out for repair and complete defective material reports. The EAM RFID application has also provided EAM with an enhanced data analysis capture for reviewing month-to-month and annual product trends.

EAM has also experienced enhanced product identification through digital printing for increased accuracy and readability of vest tags.



PACKING AND SHIPPING MADE SIMPLE

EAM RFID Solutions has eliminated the use of manual counts in the packing process. The packing department can now verify correct part numbers and record the weight of packages in seconds. The RFID system has also created the ability to monitor all cartons in the shipping area, tracking all package arrival and departure.

As a result of the EAM RFID Solutions software platform, this information can be viewed in real-time by EAM's internal team and the company's clients and distributors. The company has achieved a near **100%** order and shipping accuracy and the packing process has increased in speed by **40%**. EAM Worldwide can now ship a greater quantity of orders per day with improved delivery times.

The company has increased the overall level of automation in manufacturing, packaging and labeling processes. RFID-enabled processes have also provided the means for error detection and correction prior to shipment to the client.

The company has improved client satisfaction by delivering the right items on time, every time. EAM's Market share has increased from **44% to 48%** as a direct result of the implementation of RFID.

EAM Worldwide now has a leaner manufacturing facility and a collaborative supply chain with enhanced profitability as a result of the complete RFID system innovated by EAM RFID Solutions.

CLIENT + DISTRIBUTOR PARTNERSHIP

TagControl

Clients and distributors are often faced with the daunting task of unpacking individual vests from shipping boxes and manually recording all products.

The alternative option previously was to receive the items in bulk without serialization, which still requires a manual count for visual confirmation.

Without the use of RFID, these items are then manually entered into the customer's existing Enterprise Resource Programming (ERP) system, which can result in mistakes due to human error.

The same RFID system that revolutionized EAM Worldwide's way of doing business, is now available to their clients and distributors as **TagControl**.

The TagControl package includes RFID tag design, RFID middleware and user interface development and its implementation for tracking, packing and shipping in a fast-paced manufacturing environment. The company feels that offering RFID to its clients and distributors is a natural progression to increase efficiencies throughout the manufacturing and sales cycle.

"As EAM's quality control manager, I have documented a significant increase in customer satisfaction in terms of the accuracy of our shipments since the implementation of RFID."

- Judith Gallo, Manager of Quality Control

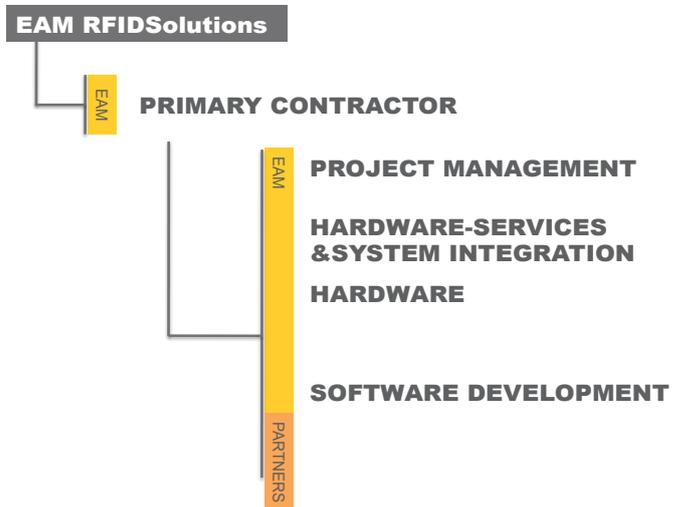
EAM RFID SOLUTIONS: AN IDEAL PARTNER

EAM RFID offers total lifecycle deployment- from planning, site survey, installation, custom RFID software and customer support.

- **EXPERIENCED** – EAM RFID Solutions was founded on the drive and ingenuity of EAM Worldwide, a 60-year manufacturer of life vests and life rafts.
- **INNOVATIVE** – EAM RFID Solutions was one of the first to patent RFID technologies in the aviation industry.
- **COMPREHENSIVE** – We offer you a complete solution by utilizing RFID partners to provide the latest hardware and backend computer design.
- **ADAPTIVE** – Our solutions are customized to resolve your greatest pain point and scaled to grow as your needs change.
- **ROI CENTRIC** – We build value for our clients by striving to produce a return on their investment in 12-24 months.

EAM GLOBAL COMPLIANCE STANDARDS

- Aerospace Standard SAE AS5678
- ATA Spec 2000 Chapter 9
- EPC Tag Data Standard(TDS 1.6)
- EPCglobal Class 1 Gen 2
- ISO/IEC 18000-6 standard



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