DOD Completes Successful Pilot

The U.S. Department of Defense Combat Feeding Program successfully completes a pilot for tracking combat rations from "vendor to foxhole."

March 12, 2004—The U.S. Department of Defense achieved a major validation of its RFID deployment plan when it recently completed a pilot project that simulated the tracking of combat rations throughout the entire supply chain, from "vendor to foxhole."
The culmination of 18 months of work, the pilot was conducted by the Natick Soldier Center DOD Combat Feeding Program and the Defense Logistics Agency at the Defense Depot in San Joaquin, Calif., from Feb. 23 to 26. It simulated 10 nodes in the DOD supply chain and showed how RFID data from Class 1 Electronic Product Code tags (EPC) could be aggregated automatically and stored on a battery-assisted passive tag (BAP) with a temperature sensor. (With a BAP tag, the battery is used to power the temperature sensor, not to broadcast a signal, so it is not an active tag.)

For the demonstration, a Class 1 tag from Alien Technology was put on each case of Meals, Ready to Eat (MREs) and Unitized Group Rations (UGR). An EPC was written to each case tag. As the cases were stacked on each pallet, the tags were read and the system checked to ensure that there were 48 cases on each pallet of MREs or 24 on each pallet of UGRs. The pallet was shrink-wrapped, and then a "check tag" (also a Class 1 tag) was put on the shrink-wrap. The check tag is used to verify the integrity of the pallet (if it is present at the arrival point, the pallet is assumed to be intact).

Each pallet was fitted with a 2.45 GHz Alien BAP sensor tag mounted on the center block. The EPC numbers for all the cases on the pallet were written to the BAP tag. A forklift equipped with an RFID reader picked up two pallets at a time and scanned the tag on each pallet. Ten pallets were then loaded into a container, similar to the ones used to ship goods to remote locations, such as Iraq. The cases were automatically removed from the warehouse inventory as they were loaded into the container, and the RFID-enabled forklift wrote each pallet's data to a BAP tag affixed to the container. The container’s BAP was scanned and entered into the system. Then, transportation-control and movement-document information—the container contents, required date of delivery, the requisitioned the supplies, port of departure, destination and so on—was written to the tag.

Four containers were used in the test. When a container arrived at a simulated overseas depot, its container was read and the depot inventory automatically updated. The temperature sensor on the pallet tags were read to assess the quality of the food based on the temperatures recorded during the "voyage." A quality index was generated using a shelf-life model developed by the Auto-ID Lab at the Massachusetts Institute of Technology (MIT) and the DOD Combat Feeding Program (if the temperature readings produce a quality factor of 75 or above, the food is fine; below 50, it needs to be thrown away). The pallets were then placed on flatbed trucks.

Inventory of the overseas depot was updated as containers came in and decremented as pallets left on flatbed trucks. The pallets of combat rations then traveled to a simulated forward supply point, where they were broken down at a station and finally cases were read with a handheld reader, simulating arrival at a combat unit in the field. The DOD was able to track the inventory in real-time throughout the entire simulated supply chain.

OATSystems provided its Senseware middleware and application layer to manage all the data. OATSystems also acted as the integrator on the project. MIT's Auto-ID Lab and the Oak Ridge National Laboratory provided technical assistance. There were almost no technical glitches during the demonstration.

The demonstration showed that the military can achieve its aim of using RFID to automatically aggregate cases to pallets, pallets to containers and containers to shipping vehicles with subsequent deaggregation to achieve total asset visibility. Alan Estevez, the Deputy Undersecretary of Defense for Logistics and Material Readiness, Supply Chain Integration, called the successful pilot the "definitive RFID proof of principle that will dramatically enhance DOD's capability for end-to-end logistics."

"We have clearly shown the strengths of passive RFID technology and the ability to aggregate and deaggregate data in real time to semi-passive tags," says Gerald Darsch, director of the DOD Combat Feeding Program. "We learned a great deal during the course of the pilot and will share the lessons learned with other agencies within the DOD."

Stephen Moody, RFID program coordinator for the U.S. Army's Combat Feeding Directorate, will be presenting more detailed results of the project at RFID Journal Live!, *RFID Journal*'s second annual executive conference.

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