

Killdeer Mountain Manufacturing is transforming its processes using a lean manufacturing and Six Sigma model, and wants to use RFID to power those changes.

By Mary Catherine O'Connor

April 9, 2007—[Killdeer Mountain Manufacturing](#) (KMM), a contract manufacturer based in Killdeer, N.D., is a family-owned business with 300 employees. KMM is one of thousands of small-to-midsize businesses that produce the parts and assemblies [Boeing](#) uses to make aircraft for the [U.S. Air Force](#).

Currently, Killdeer is in the process of overhauling its manufacturing processes, using Six Sigma and lean manufacturing practices as guidelines. Radio frequency identification, says KMM's vice president Dan Hedger, will play an important part in streamlining the company's manufacturing processes.

KMM is working with [Microsoft](#) and plans to deploy the beta version of the computer giant's BizTalk RFID middleware to link an RFID hardware infrastructure to the manufacturing resource management module that will be part of Microsoft's Dynamic GP (formerly Great Plains) business-management software. The company plans to work closely with Boeing to enable a just-in-time manufacturing process, allowing KMM's manufacturing schedule to closely match Boeing's parts-consumption schedule for military aircraft, eliminating excess inventory for both companies.

Hedger says KMM has architected a three-phase process for realizing its goals. The first phase, which it has already completed, consisted of establishing an architecture for linking Boeing's parts replenishment and ordering systems with KMM's order-management procedures, as well as automating both companies' shipping and receiving functions. This phase also consisted of small-scale tests involving the placement of passive RFID tags on shipments of products sent from KMM's manufacturing site to a Boeing facility, then using advance shipment notices to ensure that orders were complete and accurately tagged. The goal of the project's second phase, set to be completed in one year, is to establish an electronic data exchange system between Boeing and KMM that will not require manual inputs.

The third and final phase, says Hedger, will be "to take the system to its highest level, with one basic goal: "We'd like to have a good enough electronic data exchange so that we can match our fabrication process to Boeing's consumption," he says. In other words, KMM will not produce a product without knowing when Boeing will need it. In addition, RFID-tagged shipments should increase the speed and accuracy of both KMM's shipping processes and Boeing's receiving methods.

Today, says Hedger, "a lot of stuff sits on [inventory] shelves, both at our site and Boeing's. We want to get it down to the point where Boeing puts a request in, and we make the part. We'll wring a lot of our manufacturing cost out in the process [by only making what we sell]."

Hedger says that one of the RFID applications KMM has tested involves using passive RFID smart cards, carried by workers, to instruct employees on how to manufacture goods. This should make the

company's manufacturing process more efficient, reducing its cycle time. "Say you have a smart card that has your assembly process encoded to it," he explains. "You take some parts from a bin, and then use a smart card to call up the correct configuration for the part on a screen. This process would be repeated at each assembly station until you are done building the part."

Quality-control workers could also use smart cards as a means of certifying the quality of finished parts. Right now, says Hedger, this is a manual process that requires writing down part names and numbers in a logbook, along with each worker's name and ID number. These steps could be replaced by assigning the finished part with a serial number encoded either to a bar code or to an RFID tag attached to the part, then associating that data with the worker's name and ID, encoded to an identification card. The longer-term vision, he says, is to tag parts and assemblies as well, enabling real-time inventory visibility.

Hedger expects KMM to complete all three phases of its internal manufacturing and supply chain optimization work within two to three years. Once that goal has been achieved, the company would like to begin commercializing its efforts by offering a product called the Supply Chain Optimization Universal Toolkit (SCOUT) to other small or midsize original equipment manufacturers serving the defense/aerospace industry. This will allow these companies to begin streamlining their operations without having to start from scratch.

In developing the tool kit, KMM will work with Boeing and the [U.S. Air Force Manufacturing Technology Division](#) to design it specifically for defense/aerospace parts suppliers. RFID technology vendors [Alien Technology](#) and [Maximum Data](#), a Michigan-based systems integrator KMM is using to deploy its RFID infrastructure, will also contribute products and services to the kit.

Eventually, the companies say they would like to develop similar tool kits for OEMs in other industries, such as automotive manufacturing. SCOUT, however, will not be available for a few more years, because KMM first plans to complete its in-house optimization work and collaboration with Boeing so it can reduce inventory levels. In addition, KMM needs to reach its Six Sigma manufacturing goals before releasing the tool kit, since it will contain best practices garnered from that process.