

The German airline is using RFID to speed up the process of switching between business-class and economy-class seats, based on real-time demand, on intercontinental flights to and from Frankfurt.

By Rhea Wessel

March 30, 2007—[Lufthansa Technik Group](#), a division of German airline Lufthansa, is using radio frequency identification to speed the process of exchanging seats on intercontinental flights leaving from and coming into Frankfurt's airport.

The application helps the airline better accommodate passengers in the cabin class they have booked and avoid having to compensate passengers if their seat class is not available. For instance, if business-class seats are in high demand for a flight, Lufthansa can remove seats from the economy class and replace them with more business-class seats on short notice; if coach-class seats are selling better and the business-class section is underbooked, the airline can install more economy-class seats at the last minute.

Before the application was implemented, Lufthansa Technik manually filled out the necessary documentation form for tracking each seat or row of seats installed on or removed from a plane. The process was time-consuming and cumbersome because personnel had to search the bottom of the seat or row of seats to find the printed serial number, then enter that number manually into the computer system.

Now, RFID-tagged seats are accounted for as workers load them from storage onto the vehicle that will transport them to an aircraft. After seats are removed from a plane and transported back to the warehouse, the RFID tag is once again interrogated by one of the three portal readers set up in the seat warehouse. The application is focused on speeding up the process of accounting for seats before they leave the planes, though the seats' tags are interrogated upon return to the warehouse so Lufthansa can track the number of seats available to switch out.

Since airlines are subject to fees if they miss their departure slots, all ground work on a plane must be done quickly. The RFID application speeds up the process of accounting for seats and allows staff to confirm when seats leave the warehouse. Such a confirmation is critical to making sure all necessary work will be completed in time for take-off. If the work cannot be done on time, the airline has to delay the flight. The RFID application has been operational since February 2006.

"Lufthansa has calculated that just by eliminating paperwork, the application has already paid for itself," says Peter Kern, managing director and chief consultant at [TBN](#), the company that implemented the application for Lufthansa Technik. Lufthansa spent just under €50,000 (\$66,770) for the application. TBN, which specializes in custom-designed antennas, delivered all the hardware for the project, while a freelance software designer that works for other divisions of Lufthansa created the necessary software.

Lufthansa approached TBN in mid-2005 about a track-and-trace solution for its seats. The company had identified seat tracking and refitting as a particularly labor-intensive process. TBN designed the RFID application and implemented it at the end of 2005. Some 1,500 seats and rows of seats are tagged with passive 13.56 MHz tags conforming to the ISO 15693 standard, and were provided by [Schreiner Group](#). The only data each tag contains is a unique ID number.

After being notified of a flight's required seat configuration, workers in the seat warehouse, located on the grounds of the Frankfurt airport, then begin loading onto trucks all seats that will need to be fitted into the plane. The employees move the seats or rows of seats from storage (all of which are stored on the ground) via a forklift specially designed to hoist these seats and the metal wheel bases (about 10-15 centimeters in height) on which they are kept. When a worker drives the forklift through the portal, an interrogator built into the floor, consisting of three custom-designed antennas, reads the RFID tags inside the plastic housing attached to a bar on the bottom of each seat or row of seats. The tags are attached with plastic cable ties and mounted on a spacer—a piece of plastic that acts as a buffer between the plastic housing and the metal of the bottom support of the seat.

During transportation, the seat RFID tag is approximately 40 centimeters above the ground. Therefore, TBN specially designed the RFID interrogator antennas to read the tags within a range of 60 centimeters. The company tested the system in its own workshop before implementing it on site at the airport, Kern says, and the deployed system achieved 100 percent read rates on the tests.

According to Kern, Lufthansa chose RFID because it wanted a solution that worked with limited involvement from employees. For this same reason, the company doesn't use a handheld reader—one that could be easily misplaced or left on a plane—in the warehouse. The only interrogators utilized are the portal readers.

Kern estimates that before the system was implemented, it took about 30 minutes to load 10 seats and collect the associated information. Now, with RFID, that process takes about five minutes. Lufthansa is planning to expand the application to about 80,000 seats at selected airports within the next two to three years, and to use the RFID tags to track their repair status.