Automation offers efficiencies

Operators are looking for ways to deal with ever more baggage

Airport operators are seeking to implement innovative baggage-handling systems that can move luggage much quicker and efficiently through international hubs, as growing passenger demand adds to the pressure on ground handlers.

Efficient systems are therefore needed that cope with the rising volume of passenger luggage without adding to staff overheads or requiring larger facilities.

The solution could be partial or complete automation of the luggage handling process such as the loading and unloading, which is currently done manually at several airports.

This automation would reduce the physical labour required, which will allow employees to focus on other service tasks at higher volumes. At peak times a packer can move luggage weighing a minimum of one tonne. This lifting often leads to injuries and disabilities, increasing staff absenteeism or a higher employee turnover.

Scientists from the Institute for Materials Handling and Logistic Systems at the Fridericianer University of Karlsruhe, Germany analysed airports worldwide to determine which form of automation in the baggage handling process can be the most effective solution.

To assess which technologies could be used the luggage process had to be analysed. This process can vary from airport to airport. The study revealed that larger airports typically have much more complexity and with it the automation of the luggage handling process increases. At small European airports, meanwhile, luggage is handled 100 per cent manually.

The use of an automatic baggage handling system is only of interest on airports with partial automation in the form of a simple or complex baggage conveyor system.

Complete automation means that luggage has to be transported, sorted, identified, loaded and unloaded automatically; the employees would only monitor and maintain the system. While the process of transport, sorting, and identification is currently automated at many airports, a fully automatic loading and unloading process remains rare.

0578373

The automatic baggage handling system from Grenzebach employs a robotic arm to grab items from the conveyor belt and transfer them into a unit load device.

Indeed, only one system is in service worldwide that can load luggage in containers and dollies automatically — at Schiphol Airport in Amsterdam, engineered and built by the Grenzebach Automation Company in Karlsruhe, Germany. This system integrates all loading functions.

The system was installed for tests at Kloten Airport in Zurich, Switzerland and has been in operation at Schiphol since 2005.

With the use of a fully automated baggage-handling system, the luggage coming from the sorter is transported by conveyor belts through a bag analyser. At Schiphol the bag analyser measures volume, weight, and orientation of each bag. These are the parameters of the incoming signal for the control software. Barcode scanners are also installed to automate the luggage reconciliation process. The loading position of each piece of luggage in the unit load device (ULD) is stored to guarantee fast and direct tracking.

The heart of the automated system is an industrial robot with a mounted handling tool, which grabs the pieces of luggage at the end of the conveyor belt and loads them into a container or dolly. To obtain optimal loading the volume of the ULD is scanned after each piece of baggage is loaded. This calculates the position for the next bag in the dolly.

Studies carried out at Karlsruhe show that suppliers of baggage-handling systems can no longer rely on a traditional sales model. Automatic baggage-handling system providers offer build-own-transfer (BOT) models employing different billing methods that avoid the upfront capital costs for the airport and the option to outsource the entire baggage-handling operation.

This may be especially interesting for small and medium-sized airports with a high number of charter flights. These airports typically cannot afford the capital investment required to purchase an automated system. It is more cost effective to utilise an automatic system with luggage from charter flights as there is no need for sortation into first, business and economy class as well as in transit. In this case the system can load all pieces of luggage from one flight.

Academics at Karlsruhe worked out BOT-models and rating matrices, where the costs of an outsourced automated system are calculated under different billing types. These expenses, as well as the airport and independent costs (such as construction works and software costs not borne by the supplier), are compared to manual handling costs to determine if an automatic system is viable. If the decision is to proceed with automation, the supplier and the airport will have to choose the correct billing type based on different risk profiles.

Andre Richter/Simon Arzt ■

RELATED ARTICLE

● **Robots lift more bags and aid safety, *JAR*, 25 November 2005**

Subscribers can access more online

Visit: jar.janes.com – jaes.janes.com