

# RFID in Airport Management

Technologies like RFID will allow air transport companies to better manage operating expenses and provide higher levels of service to customers, while operating more safely and securely

**A**s the global economy grows and the pace of business transactions accelerates, the air transport industry faces greater challenges and demands. Customer expectations for shorter delivery times and better availability of in-transit service continue to grow. To meet these ever-increasing demands, the air transport industry must provide higher levels of service and guarantee higher levels of security. RFID, along with other AIDC technology like Biometrics and GPS, will assist in overcoming some of the barriers presented by current airport processes.

For airports and airlines, what looks like a deceptively simple task is getting ever-more complex as lengthy security procedures, worsening airport congestion, increased interlining and mounting passenger and baggage volumes delays and complicate handling procedures. Routing more traffic through central hubs also means that small problems at one site can rapidly snowball out of control, affecting baggage and passenger transfers at other destinations down the line.

RFID technologies offer many benefits to the air transport industry.

The use of these new technologies will allow air transport companies to better manage operating expenses and provide higher levels of service to their customers while operating more safely and securely.

RFID technology can strengthen airline industry and security by tracking passengers baggage in real time, preventing the improper loading of baggage, preventing baggage loss, preventing baggage cross-pickup, minimizing sorting errors by the baggage handling system, minimizing the time needed to match passengers and baggage, improving maintenance and tracking of unclaimed baggage, checking passenger information regarding dangerous baggage in real time to help identify suspicious people in real time, displaying information about arrived baggage to baggage handlers and tracking man and material in real time.

## Areas of Focus

Some of the areas of concern are baggage management, security (passengers, personnel and baggage), and operations (check-in, boarding pass issue, operating costs, efficient utilization of human resources, and accurate billing).

## RFID Enabled Process

The process starts when personnel enter the entrance of the airport. All employees are given RFID enabled



**RFID implemented process at the Airport entrance**

ID cards that validate the staff at the entrance through the RFID readers installed there.

When passengers check-in at the airport, they would be given boarding passes. The boarding passes would carry data like flight details, personal details, passport number, checked in baggage information (number of bags, weight, etc), and associate passengers that are traveling as a family or in a

## e-Passports

An RFID passport is the same as a traditional passport with the addition of a small RFID embedded in the back cover. The tightening of security required the border control to take steps in cracking down on counterfeit paper passports with the help of the new RFID enabled passports.

The RFID tagged passports will store the same information that is printed on the data page of the passport, including a digitized fingerprint, and will also include a digital picture of the owner, which will facilitate the use of face recognition technology at ports-of-entry, the unique chip identification number and a digital signature to protect the stored data from alteration.

RFID tagged passports have been issued by the US, the UK and many European governments and other countries around the world. Among the very first RFID-based



**RFID-based boarding pass generation**

group.

The system would also read the new RFID enabled passports and validate the information contained in it, and immediately associate the passenger's current flight details to their boarding pass. These details are associated at the secure master database level with the serial number of the RFID tags simultaneously as the employee is generating the boarding pass. Both the passenger and the baggage are tagged, and associated with each other

All baggage, including hand baggage and the passengers would carry RFID enabled tags with the same information as on the boarding pass with the same ID number. If a fam-

ily of four passengers is traveling together or passengers are traveling in a group, they can be associated with each other.

The passenger then proceeds towards the aircraft after the immigration control and security check procedure. The system will update the master database at each check point. If any passenger has not checked in at these stations at the predetermined time before departure, then the system will SMS the passenger that they need to immediately proceed to the specific area.

At the time of boarding the aircraft, the passenger is validated once again on entry to ensure that he/she is boarding the right flight and no unauthorized personnel or baggage is boarding the plane with the help of the RFID hand-held reader. The "passenger-on-board" message is immediately sent to the system. In case of any discrepancy or passengers not checked in alarms are generated and the system starts sending SMS to the passengers that the boarding gate will close in x minutes. The system will also notify the airline personal, as to the last checkpoint the passenger



**RFID implemented passenger-boarding process**

cleared. Enabling the airline employees to physically search of the passenger.

The baggage follows the same procedure and is passed through the conveyor belt. Each tag carries a unique identifier that is read while the bag is transported to conveyor belts to route it to screening machines and then on to the appropriate plane. Also, the weight sensors check the weight of the baggage along the route, if there is any change in weight, the system will place the bag in a temporary holding area and immediately notify the supervisor that the particular bag has been tampered with and at what

passports were issued by the Malaysia government in 1998. The Malaysian RFID passports record the travel history (time, date, and place) of entries and exits from the country in addition to the basic information contained on the visual data page of the passport.

To prevent unauthorized skimming (reading) of the information contained in the RFID chip by readers when the passport is closed, the passports will incorporate a thin metal lining. Skimming is the act of obtaining data from an unknowing end user who is not willingly submitting the sample at that time. Eavesdropping is the interception of information as it moves electronically between the chip and the chip reader.

The International Civil Aviation Organization (ICAO), has set standards for RFID passports are contained in ICAO

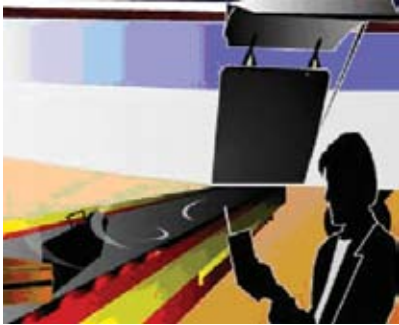
Document 9303, Part 1, Volumes 1 and 2 (6th edition, 2006). ICAO refers to the ISO 14443 RFID chips in e-passports as "contactless integrated circuits". ICAO standards provide for e-passports to be identifiable by a standard e-passport logo on the front cover.

The electronic passport logo is the international symbol for an electronic passport. It signifies that the passport contains an integrated circuit or chip on which data about the passport and passport bearer is stored. The logo will be displayed at border inspection lanes at all airports and transit ports equipped with special data readers for

#### **Electronic Passports**

The special features of an electronic passport are:

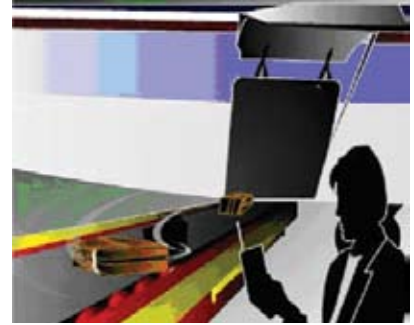
- Securely stored biographical information and digital image that are identical to the information that is visually displayed in the passport
- Contactless chip technology that allows the information stored in an electronic passport to be read by special chip readers at a close distance
- Uses digital signature technology to verify the authenticity of the data stored on the chip. This technology is commonly used in credit cards and other secure documents using integrated circuits or chips
- The electronic passport facilitates travel by allowing automated identity verification and faster immigration inspections
- Greater border protection and security



**RFID enabled baggage-loading process**



**RFID enabled disembarking process**



**RFID enabled baggage-unloading process**

location the bags weight changed and by how much, and that immediate action is necessary. This prevents things being stolen from the passenger bags as well as making sure that no foreign objects are added to the bags after they have been checked in by the passengers.

At the time of disembarking from the plane, passengers are again validated to check for the presence of any unauthorized passengers who might have traveled or passengers who would have disembarked erroneously on some other port. In case of any discrepancy, alarms are generated.

A similar procedure is followed for the baggage again. All baggage's are scanned, and any unauthorized baggage if found is immediately reported.

At the baggage collection area passengers locate their baggage faster and more accurately. RFID readers installed at appropriate locations over the baggage conveyor read the tags on them and this information is displayed on an overhead monitor. The monitors can display the name of the baggage owner through the association created earlier.

Finally as the passenger is exiting the airport, he/she is again validated to check if the passenger is carrying the correct luggage thus ensuring security of the luggage.

Once the passenger exits the airport, the passenger and the baggage RFID tags are deactivated (killed).

The RFID system can provide



**RFID enabled baggage collection process**



**RFID enabled exit system at the Airport**

monitoring and control facilities to ensure that no unauthorized access is possible in high security areas, and personnel have to pass through multiple biometric access points to gain access to those areas. The system can also provide the real-time location of individual passengers, analyze traffic and the behavior of individuals, and observe and record unusual behavior and notify the concerned personnel to take appropriate action.

## Benefits

The usage of RFID in airport management can help in tracking baggage in real time, preventing the improper loading of baggage, preventing baggage loss and cross-pick-up, minimizing sorting errors by the baggage handling system, minimizing the time needed to match passengers and baggage, improving maintenance and tracking of unclaimed baggage, checking passenger information regarding dangerous baggage in real time, checking passenger information to help identify suspicious people in real time, displaying information about arrived baggage to baggage handlers and passengers, hassle free and error-free movement of all passenger baggage, monitoring movement of all internal employees, monitoring the movement of all tagged assets and monitoring the movement of all vehicles belonging to or working for the airport authority, airlines, etc.

Effective air transport management requires timely, accurate information. Gathering the information must be convenient, otherwise operators will tend to skip the step and hence data integrity will be compromised. Our past can open doors to our future. Whether we realize it or not, RFID technology will be an integral part of our life.

—Homi Limbuwala  
 VP, Business Development,  
 SkandSoft Technologies  
 maildqindia@cybermedia.co.in