Roman Screening: a 21st century arena

The city of Rome is steeped in history. A modern, vibrant city life exists alongside some of the world's most famous monuments that have borne witness to some of the greatest technological developments in bygone civilisations. Whilst the Romans of yesteryear may be famous for their roads, the current inhabitants of the city have set into action a plan that could well place them in future history books for their development of another mode of transport's infrastructure. Italian aviation security is prepared for the 21st Century. **Philip Baum** visited Fiumicino to look at their state-of-the-art hold baggage screening system.

Rome will feature in any book on the history of aviation terrorism. Sadly, for all the wrong reasons. Some of the most tragic incidents in the chronology of attacks have centred on the Italian capital – from the check-in massacre to the fateful hijacking of TW847. And so, it is hardly surprising that the authorities are keen to dispel that image and portray themselves as one of the airports that is actively implementing security measures.

AEROPORTI DI ROMA

Fiumicino and Ciampino are the first airports in Italy to bring security checks of passengers and their baggage into line with European practice. Since March 20th, Aeroporti di Roma (ADR), the company that operates the capital's two airports has taken over the responsibility for such checks from the State Police Department.

To this end, ADR has created a new Airport Security Division with a staff of 300 (30% of whom are women), including 220 newly hired personnel on permanent contracts. The new staff members, who were carefully selected on the basis of their psycho-attitudinal and medical profiles, are young high school certificate holders. All have undergone training at ADR's training centre at Ciampino, carried out with the assistance of ICTS International. Furthermore, on-the-job training was conducted by experts from the State Police. Employees have thus acquired all the skills necessary to meet ICAO standards.

Prior to being hired, all trainees underwent a fitness test certified by ENAC (the Italian Civil Aviation Authority). Each staff member also holds a Special Security Guard Licence, issued by Rome Police Headquarters, and wears a special uniform designed to make them easily recognisable to passengers.

The State Police now concentrate on public order issues, deploying the approximately 100 officers replaced by ADR's staff to carry out other important activities relating to passport control, criminal investigations, anti-terrorism and the implementation of measures designed to combat illegal immigration.

Aeroporti di Roma itself was founded in 1974. In 1999, the company handled approximately 25 million passengers and 285,000 air traffic move-

Photo Credit: Aeroporti di Roma

Fiumicino Airport

ments. With its own declared strategy of making Fiumcino the aviation hub connecting Europe with the southern hemisphere, ADR has been heavily investing in airport development. There are three terminals (A for domestic flights, B for Schengen flights and C for international) and a cargo area, known as Cargo City, is under construction. The company has also acquired holdings in Genoa and Lamezia Terme airports, and in March 1998 ADR became a strategic shareholder of Airports Company South Africa (ACSA) which controls 11 South African airports; ADR acquired 20% of its capital.

In Fiumicino itself, the airport has witnessed a growth of over 12% in the last year and has regained lost ground caused by what is locally known as the "Malpensa Effect" (when Alitalia moved the majority of their intercontinental flights to Milan from Rome). In the first week of July this year, the airport handled an average of 81,000 passengers per day – all of whom generate considerable quantities of baggage.

BAGGAGE HANDLING

The baggage handling system (BHS) itself was designed and installed by Elsag and CML Technology and entered into service in October 1997. It is capable of handling 12,000 bags per hour, which is regarded as sufficient capacity to see the airport through until 2005, by which time a further baggage handling system will have been installed. The current system copes using two belts operating at half speed, so that should one fail the other could still cope with the increased demand.

A system of belt conveyors collects bags from the check-in desks and transfers them from four introduction lines to the four primary sorting machines. Here, four sets of Automatic Tag Readers (ATRs), each of which is made up of 16 individual readers, read the ten digit IATA codes that instruct the secondary sorting machines to send bags to the correct chute or early baggage sorting line. All baggage for destinations the system cannot identify automatically (tag not read, tag missing, baggage item unknown by control system) is sent to a manual coding station.

Elsag's BHS communicates with three different IT airport systems:-

AMIS is the Rome Airport Information System from which the BHS gets all the information about arriving and departing flights.

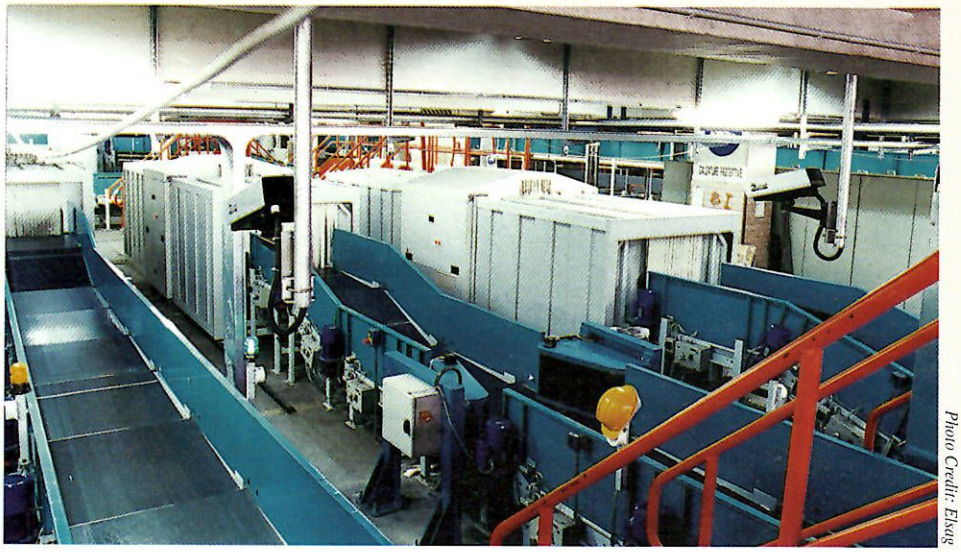

Photo Credit: Elsag

The L3 eXaminer 3DX 6000 installed in Fiumicino's HBS system

CUTE/2 is the system that allows data interchange between the airline's departure control system (DCS) and the check-in systems.

ARCO is the DCS for Alitalia and all other airlines for which Aeroporti di Roma acts as a handling agent. The BHS collects all the information about the baggage from the BSI Unit of CUTE/2 and from ARCO.

Elsag also designed the baggage reconciliation system that includes a radio network of 60 radio mobile terminals that send data to two radio base units.

Elsag are relatively new to the airport game. Other than Rome, their only other international airport project is at Bucharest's Otopeni airport, where they installed a BHS in 1996. That said, the entire sortation system for the Italian Post Office was installed by Elsag, and with the Fiumicino project now complete, they are bound to be in the running to win other airport contracts.

HOLD BAGGAGE SCREENING

The European Civil Aviation Conference (ECAC) deadline for the implementation of 100% hold baggage screening is 31st December 2002. Aeroporti di Roma is, however, prepared well ahead of time and has just completed the adaptation of its baggage handling systems in both Fiumicino and Ciampino.

The system comprises of 11 PerkinElmer Z-Scan X-ray machines, five of L-3's eXaminer 3DX™ 6000 CT scanners and a Dynasafe MECC 5 explosive containment chamber. The contract for the HBS was actually awarded to PerkinElmer. However, for both L3 and

Photo Credit: Elsag

The 100% HBS at Fiumicino

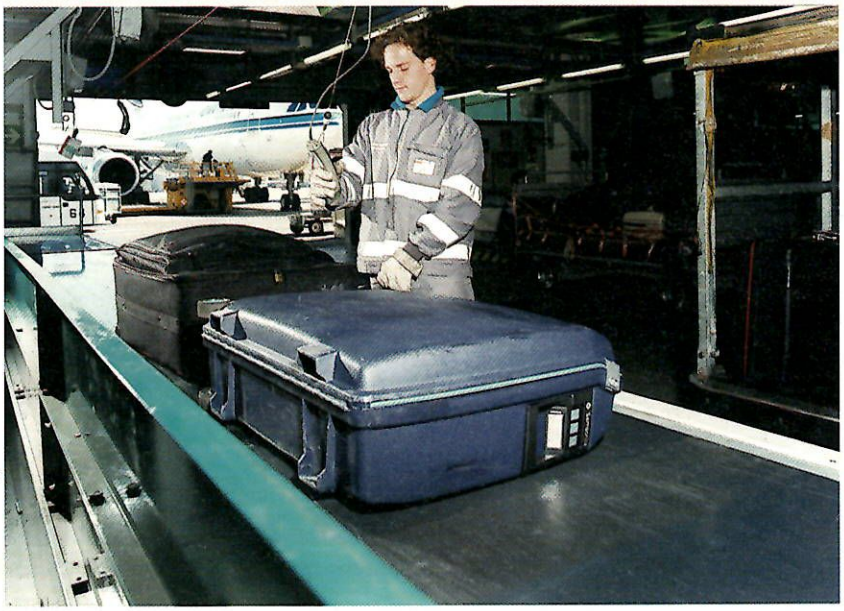

Photo Credit: Elsag

Dynasafe, their participation marked both companies first major installations into an airport's HBS.

The funding for the contract actually came from both the Ministry of Interior and the Ministry of Transport, well ahead of the December 2002 deadline, primarily due to real concerns that Rome might be the target of terrorist activity in the year 2000. With the world's attention focusing on the Vatican and a number of high-profile Papal missions overseas taking place, the threat level warranted early investment.

The Z-Scan systems process around 1,210 bags per hour, 25% which are transferred, using the Elsag BHS, to the L3 CT-scanners at Level 2.

CT SCANNING

It was stipulated during the bid process that a throughput of 450 bags per hour would be required at Level 2. As a result of this, along with FAA certification and a competitive price, L3 was the company chosen to supply Level 2 screening equipment. Whilst there was some concern raised that the equipment was not film safe, the authorities realised that CT-based screening systems cannot be film safe and that, the explosive detection capabilities of L3 equipment were of far greater importance.

Of the 25% of bags screened using CT technology, only 20-25% require operator inspection, being some 5% of

the total number of bags entering the BHS. Of these a minimal number are actually pulled aside for physical search.

When operator intervention is required, the eXaminer's operator is presented with five different images of each bag being simultaneously screened. Three images are stationary views of the threat item viewed from different angles, one image provides for three-dimensional examination as it rotates and the fifth image marks the position of the threat item within the bag.

The operators are being provided with training by an L3 instructor, although the intention is for ADR to handle the training themselves in the future, utilising computer based training techniques.

L3 is represented in Italy by C.I.E.R., a Rome-based importer of aerospace products, established in the Italian market since 1944. Rather than simply being sales agents, they have been actively involved in supporting the installation process. In addition to the five systems installed at Fiumicino, two more systems have been supplied to Ciampino and a decision is awaited from Venezia as to what equipment they will utilise. Cagliari in Sardinia, Bari and Catania in Sicily are also expected to implement 100% HBS in the near future. L3 appreciates that each tender is drawn up separately, however the success of the

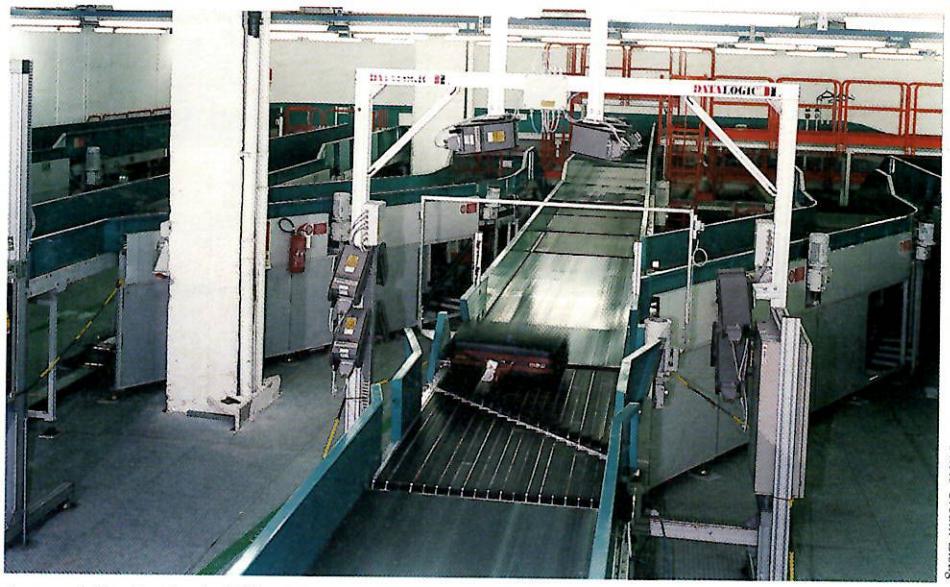

Photo Credit: Elsag

Automatic Tag Readers in BHS at Fiumicino

Photo Credit: Gilardoni

Gilardoni X-ray machines are used for cabin screening at most Italian airports, including Fiumicino and, as hown here, Malpensa 2000

Rome project bodes well for the future.

Rome has certainly proved that L3's eXaminer is set to be a key contender in the aviation security market and, as more and more airports gear up to the ECAC 100% HBS requirements, L3 are optimistic about their potential sales.

As with any new product, trials have been extensive. In the Rome example, the product was selected in February 1999, and the contract awarded in March 1999. Then ADR personnel visited L3's manufacturing plant (Analogic) in Boston to verify performance claims, including throughput rate and explosive detection capabilities. The first machine arrived in Rome for trials in May and, thereafter, for 45 days the Italian authorities put the eXaminer through its paces. The balance of the order was shipped to Rome between November 1999 and March 2000, with the entire HBS going into test phase in April 2000. The final certification of the HBS is expected within weeks.

THREAT BAG CONTAINMENT

Any bag rejected by the operator of the eXaminer is sent for physical search. If the operator feels the threat is very high, the bag can be transferred directly into Dynasafe's Movable Explosive Containment Chamber (MECC). This has been actually integrated into the HBS system and enables the bag to be contained and removed by wheeling the MECC to a safe location. For Dynasafe, this represents their first major installation in a BHS.

There has been some concern raised as to whether total containment is advisable, as it is felt by some that the effects of an explosion inside the MECC could be much worse if the explosive charge is one that is larger than the containment capabilities of the system. To date, fortunately, the system has yet to be used.

The BHS is not yet complete. A tender is soon to be issued for a further three oversize X-ray machines to handle out of gauge baggage.

CABIN BAGGAGE

All screening of cabin baggage at Fiumicino is performed using Gilardoni X-ray equipment. The company is Italian (established in 1947) and is involved in R&D as well as being a manufacturer. Of their $35 million turnover, around a third is the manufacture of medical X-rays, a third is in non-destructive testing, such as ultrasound and a third is in security X-ray.

Within the X-ray manufacturing industry, Gilardoni is unique inasmuch as they actually manufacture their own X-ray tubes. Indeed, Gilardoni supply other X-ray manufacturers.

Gilardoni do not only supply the Italian market. Their products are found in Thai prisons, at installations in Argentina and even Amsterdam Schiphol rented six systems for use during the European Soccer Championships. In Brazil, Gilardoni has recently supplied 55 systems for customs

INSPECTIONS

Together with Frontline International, Gilardoni has developed a training system for airports that, as Gilardoni equipment is PC based, can reside on the X-ray operators actual screen. Furthermore, Gilardoni has developed a PC-based training system together with S.E.A. in Milan that is now being utilised at 33 Argentinian airports.

CONCLUSION

Fiumicino is an impressive airport to the passengers with the good fortune to transit through it. What the passenger does not see, however, is how the authorities are investing not only in building an aesthetically pleasing terminal, but also in ensuring a secure environment that meets European and international standards, both in respect of passenger and baggage screening.

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ASI wishes to express its appreciation to Aeroporti di Roma for facilitating the visit to the HBS system at Fiumicino, especially Giorgio Gregori (Programme Manager, Airport Systems) who conducted the tour of the facility. Our thanks are also due to Joe Paresi of L3, Stefano Bolla of C.I.E.R., Marco Gilardoni of Gilardoni and Serafina Raneri of Elsag for their assistance.