



International Civil Aviation Organization

CAR/SAM Regional Planning and Implementation Group (GREPECAS)

Fourteenth Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/14)

San Jose, Costa Rica, 16 – 20 April 2007

GREPECAS/14 – WP/09

22/02/07

Agenda Item 3: Assessment of development of regional air navigation and security infrastructure

3.2 Report of the AVSEC Committee/5 Meeting

(Presented by the Secretariat)

SUMMARY

This working paper presents to the Meeting the results of the Fifth Meeting of the Aviation Security Committee (AVSEC/COMM) for approval.

Action by GREPECAS 14 is proposed in paragraph 6.

References:

- AVSEC/COMM/5 Report (Buenos Aires, Argentina, 11-13 May 2006).

1. Introduction

1.1 The Fifth Meeting of the GREPECAS Aviation Security Committee (AVSEC/COMM/5) reviewed the work of the AVSEC/COMM/4 Meeting. This working paper presents a summary of the discussions and eight Draft Conclusions adopted by the meeting, which are presented in **Appendix A** to this working paper, for approval by the GREPECAS/14 Meeting. During the meeting, three Task Forces were created, one to work Cargo Security (AVSEC/CARGO/TF), Passenger/Cabin Baggage Screening (AVSEC/PAX/BAG/TF) and Facilitation (AVSEC/FAL/TF); likewise, an Ad Hoc Group was created to review the Hold Baggage Screening (HBS) final report and validate the HBS action plan.

2. Review of the AVSEC/COMM/5 and GREPECAS/13 Meeting Results

2.1 The Meeting reviewed and updated the AVSEC/COMM/5 and GREPECAS/13 meeting conclusions. As a result of the action taken by these meetings, the following conclusions have been **completed** or **superseded**: 12/110 (3/9), 12/117 (3/16), 13/13 (4/11) and 13/14 (4/12).

2.2 The Meeting reviewed the conclusions and noted that the following remain **valid**: 12/103 (3/1), 12/109 (3/8), 12/111 (3/10), 12/112 (3/11), 12/113 (3/12), 12/118 (3/19), 13/7 (4/5), 13/8 (4/6), 13/9 (4/7), 13/10 (4/8) and 13/15 (4/13).

2.3 During the Meeting a survey was conducted to validate five previous conclusions and determine the level of States' compliance with the implementation of the Annex 17 provisions regarding International AVSEC Conventions (12/109), Operators Aviation Security Programme (12/111), National Civil Aviation Security Programme (13/8), National Quality Control Civil Aviation Security Programme (13/9), Cargo Security Programme (13/10). 11 of the 15 States present participated in the survey and indicated that the majority were complying with these AVSEC provisions as noted in these conclusions.

2.4 The results of the AVSEC survey during the meeting were as follows: **Conclusion 12/109 – International AVSEC Conventions:** 9 responded affirmative and 2 responded negative. **Conclusion 12/111 – Operator Aviation Security Programmes:** 8 responded affirmative and 3 responded negative. **Conclusion 13/8 – National Civil Aviation Security Programme:** 9 responded affirmative and 2 responded negative. **Conclusion 13/9 – National Quality Control Aviation Security Programme:** 7 responded affirmative and 4 responded negative. **Conclusion 13/10 – Cargo Security Programme:** 7 responded affirmative and 4 responded negative.

2.5 The Meeting adopted **Draft Conclusion 5/1-AVSEC Implementation Survey**, which required ICAO to conduct a survey by 1 September 2006, to determine CAR/SAM States compliance with these AVSEC provisions. This Draft Conclusion was pre-approved by the ACG fast-track mechanism on 15 September 2006.

2.6 By the end of January 2007, ICAO had received survey responses from ten States, Argentina, Barbados, Belize, Canada, Chile, Colombia, Guyana, Honduras, Nicaragua, and Paraguay. The results indicate that the majority of the States are complying with the Annex 17 provisions regarding these five conclusions. However, the results of the survey indicate that the States are in need of technical assistance to revise their **National Civil Aviation Security Programme, National Civil Aviation Security Quality Control Programme and Cargo Security Programme.**

3. Review of Global and Regional AVSEC Developments and Activities

3.1 The Meeting reviewed the Global and Regional AVSEC Developments and Activities together with the most recent AVSEC provisions such as the Amendment 11 to Annex 17, revision of Doc 8973 - *Security Manual for Safeguarding Civil Aviation against acts of unlawful interference*, restructuring of the Security and Facilitation Branch into two branches, creating the Coordinated Assistance and Development (CAD) and the Specification and Guidance Material (SGM) sections, and the development of an ICAO publication on Machine Readable Travel Documents (MRTD).

3.2 The Meeting adopted **Draft Conclusion 5/2 - Recruitment of AVSEC Professionals** in support of the CAD Section and the Technical Cooperation Bureau (TCB) in launching a strategy to compile a new roster of aviation security professionals as short term experts.

3.3 The Meeting was informed of the ICAO USAP audit schedule and 2006-2007 follow-up visit plan. The Meeting noted that very few States have taken advantage of the ICAO AVSEC assistance mechanism to help States strengthen implementation and cooperation in civil aviation security, particularly in the remedial stage after a USAP visit.

3.4 The Meeting discussed that several States were encountering difficulties in funding travel for their AVSEC/COMM members and national AVSEC officials wishing to participate in these meetings. The Meeting agreed that ICAO should approach the Organization of American States (OAS) Inter-American Committee against Terrorism (CICTE) to determine if fellowships could be provided for members wishing to attend these meetings. The Meeting was informed that the matter was still being discussed with the OAS/CICTE coordinator.

3.5 The Meeting reviewed information of the Phase II ICAO/Canada Training Awareness Programme referred to as “Counter Terrorism Capacity Building Programme,” which includes 50 aviation security workshops, 13 courses and 2 seminars in the CAR/SAM Regions from 2006-2009. The programme is targeted for the Civil Aviation Authorities, airport administrations, air operators and airport police authorities and includes topics such as the National Civil Aviation Security Programme, National Quality Control Programme, passenger/cabin baggage screening, the Cargo Security Programme and human factors.

3.6 The Meeting discussed holding a FAL/AVSEC seminar, which was planned by ICAO CAD Section together with the TCB. The event was coordinated by the Security and Facilitation Branch and the NACC Office, and held in Santo Domingo, Dominican Republic, on 27-30 June 2006. The topics presented were Amendment 11 to Annex 17, Annex 9, quality control, biometrically enhanced e-Passports, hold baggage screening, changes in the Security and Facilitation (S&F) branch, MRTDs, USAP programme, AVSEC/COMM initiatives, air cargo security, border control and clearance, threat and risk assessment, passenger/baggage screening and human factors.

3.7 The Meeting reviewed and discussed a proposal made by Colombia which highlighted the importance of training officials related to MRTD using the ICAO TRAINAIR methodology to establish standardized Aviation Security Training Packages (ASTP) for the CAR/SAM Regions.

3.8 The Meeting adopted **Draft Conclusion 5/3 - ICAO MRTD Initiative**, to have ICAO develop a MRTD ASTP prior to 2010.

4. Development of the AVSEC/COMM Work Programme

4.1 Hold Baggage Screening Task Force Developments (AVSEC/HBS/TF)

4.1.1 The Meeting reviewed the report of the first meeting of the Hold Baggage Screening Task Force (AVSEC/HBS/TF/1) held in Monterrey, Mexico, from 1 to 2 December 2005, where the Task Force analyzed the data presented at the Hold Baggage Screening Seminar for the NAM/CAR/SAM Regions that took place at Monterrey, Mexico, from 28 to 30 November 2005. The Meeting discussed that the objective of the seminar/meeting was to assist States in urgent need of technical information in order for them to implement Standard 4.4.8 of Annex 17 – *Security*, by 1 January 2006.

4.1.2 The AVSEC/COMM/5 decided to establish an ad hoc group to review the HBS report and HBS action plan presented by the Rapporteur of the HBS Task Force. The ad hoc group recommended that the report be summarized and the HBS action plan be validated, as presented in **Appendix B** to this working paper.

4.1.3 The summary of the AVSEC HBS/TF/1 requested by the ad hoc group is presented in **Appendix C** to this working paper for information and corresponding actions by GREPECAS. The Meeting adopted **Draft Conclusion 5/4 - Hold Baggage Screening (HBS) Guidance Material**, which was pre-approved by the ACG fast track mechanism on 15 September 2006.

4.2 Identification and Analysis of Shortcomings in the Implementation of ICAO AVSEC Provisions in the CAR/SAM Regions and Development of Measures to Facilitate their Resolution.

Quality Control Model Programme

4.2.1 The Meeting reviewed an information paper to develop the essential components of a Model National Quality Control Programme. The Meeting agreed that, due to the current development of ICAO guidance material in Doc 8973 of Quality Control and National Civil Aviation Security Training Programme, it was better to wait until that material was published.

4.2.2 The Meeting reviewed quality control programmes by Colombia and IATA on its implementation. Colombia's programme was described as a self-Control system for the management of aviation security and IATA's Security Management System (SEMS) emphasized the value of the self-control system, a component of a more comprehensive Security Management System that facilitated stakeholder cooperation, accountability and implementation of appropriate aviation security measures.

Quality Control Programmes sharing system

4.2.3 The Meeting expressed the need for more education to clarify the quality control concepts, their definition and implications for implementation. The Meeting agreed this would assist States in the adoption of a systems approach to ensure the quality control requirements under Amendment 11 of Annex 17.

4.2.4 The Meeting reviewed and discussed the proposal made by Colombia encouraging States to share information regarding quality control programmes in order to facilitate their implementation. Therefore, the Meeting adopted **Draft Conclusion 5/5 - Identification of Common Criteria in Quality Control Programmes.**

Cargo Security Programme Model

4.2.5 The Meeting established a Cargo Security Task Force to develop a consensus regarding the development of a Cargo Security Programme Model. Bolivia volunteered as the Rapporteur of this Group composed of Argentina, Chile and IATA. The Group established the essential components that should be considered as general guidance for the development of a Model Cargo Security Programme included in **Appendix D** to this working paper. The Meeting noted that the States are in urgent need of cargo guidance to develop their National Cargo Security Programmes and decided to create a **Cargo Security Task Force.**

4.2.6 The Meeting adopted **Draft Conclusion 5/7 - Cargo Security Programme Workshop** as a matter of urgency to assist States in the development of their National Air Cargo Security Programme.

4.3 AVSEC Training Task Force Developments (AVSEC/TRAIN/TF)

AVSEC Instructor/Consultant Directory

4.3.1 The Meeting reviewed a list of qualified AVSEC instructors available in the Regions for future AVSEC training events. Based on the above, States are encouraged to identify qualified AVSEC instructors to be certified by ICAO and to establish a new list. The Meeting also decided that the

AVSEC/TRAIN/TF update and maintain a list of qualified AVSEC instructors available in the Regions and share that list with the ICAO Aviation Security Training Centres for AVSEC training purposes.

Passenger Screening Guidance Material and Passenger/Cabin Baggage Screening Seminar

4.3.3 The Meeting reviewed and discussed a proposal for the creation of a Passenger/Cabin Baggage Screening Task Force (AVSEC/PAX/BAG/TF) to develop a Passenger Screening Programme Model and a Passenger/Cabin Baggage Screening Seminar. The Meeting discussed that in 2005, a number of States requested a passenger screening seminar that would provide States in the CAR/SAM Regions with current information on screening techniques and advance technology to counter new and emerging threats to civil aviation. Antigua and Barbuda volunteered to be the Rapporteur for the group comprised of Argentina, Canada, Jamaica, United States, Venezuela, the Territories of the United Kingdom and IATA.

4.3.4 The Meeting decided to create a Passenger/Cabin Baggage Screening Task Force and developed the terms of reference to conclude its work programme by the AVSEC/COMM/6. The Task Force agreed that the term “model programme” be changed to “guidance material,” and drafted terms of reference which would highlight areas relevant to guidance material for passenger screening in order to expand its scope. The Meeting reviewed a guidance material structure proposed by the Task Force.

4.3.5 The Meeting discussed a proposal made by Jamaica to host the seminar/meeting on 13-15 November 2006, since the Caribbean Region would host the World Cricket Games during March of 2007. The Task Force was to develop an agenda for this 3-day Passenger/Cabin Baggage Seminar in coordination with the ICAO NACC Office. This would facilitate States with current information on passenger and cabin baggage screening techniques and advance technology that would counter the new and emerging threats to civil aviation. A two-day Task Force Meeting would follow the seminar to analyze the presentations, incorporate the data into their framework, and formulate their findings in a report to be presented at the AVSEC/COMM/6.

4.3.6 This seminar was postponed to 18-22 June 2007, at Ocho Rios, Jamaica due to a change in Task Force Rapporteur and changes in the Phase II of the ICAO/Canada Awareness Training Programme that will support this event.

4.3.7 The Meeting reviewed and adopted **Draft Conclusion 5/11 - Passenger/Cabin Baggage Screening Seminar**, which was pre-approved by the ACG fast track mechanism on 15 September 2006.

4.4 Regional Mechanism for Sharing Security Information on Threats to Civil Aviation

4.4.1 The Meeting reviewed and discussed a proposal to that would include a regional mechanism for sharing security information on threats to civil aviation. ICAO had established an Aviation Security Point of Contact (PoC) Network for the communication of imminent threats to civil air transport operations. The Meeting reviewed that the objective of the PoC network was to provide international aviation security contacts within each State, who were designated as the appropriate authority to send and receive communications, at any time of the day or night, concerning imminent threat information, security requests of an urgent nature, and/or guidelines to support security requirements in the case of countering an imminent threat.

4.4.2 The Meeting adopted **Draft Conclusion 5/12 - AVSEC Point of Contact (PoC) Network**, which was pre-approved by the ACG fast track mechanism on 15 September 2006.

4.5 Review and Update of the AVSEC/COMM Work Programme and Terms of Reference

4.5.1 The Meeting reviewed and revised the terms of reference, work programme and composition of the Aviation Security Committee, and its results were included in the report as shown in GREPECAS/14 WP/19.

5. Agenda Item 5 - Other Business

5.1 The Meeting also discussed some of the Facilitation (FAL) initiatives proposed by ICAO and decided to prepare for Annex 9 provisions in support of its implementation by establishing a Facilitation Task Force (AVSEC/FAL/TF) with its terms of reference. Peru was designated as Rapporteur of the AVSEC/FAL/TF.

5.2 The Meeting discussed interest by the United Kingdom Territories in possibly hosting the AVSEC/COMM/6 Meeting in Cayman Islands; nevertheless, this situation could not be confirmed.

6. Coordination between GREPECAS AVSEC/COMM and LACAC AVSEC Group

6.1 The AVSEC/COMM Secretary was informed in February 2007, by the LACAC Secretary, that its Group of AVSEC Experts will not jointly meet with the AVSEC/COMM this year as they will convene a FAL/AVSEC seminar from 5-9 November 2007, in Bolivia.

7. Actions Suggested to the Meeting

7.1 The Meeting is invited to:

- a) note the information contained in this working paper; and
- b) review and approve the Draft Conclusions shown in Appendix A to this working paper, as well as the other Appendices.

APPENDIX A

DRAFT CONCLUSIONS OF THE AVSEC/COMM/5 MEETING

**DRAFT
CONCLUSION 5/1¹ AVSEC IMPLEMENTATION SURVEY**

That ICAO conduct an AVSEC Survey by **1 September 2006**, to determine compliance of Annex 17 Standards regarding the National Civil Aviation Security Programme, National Quality Control Programme, Cargo Security Programme and Operator Aviation Security.

**DRAFT
CONCLUSION 5/2 RECRUITMENT OF AVSEC PROFESSIONALS**

That the States:

- a) review the ICAO prerequisites and forward this information to AVSEC qualified individuals in their administrations; and
- b) encourage qualified individuals to apply to ICAO to assist States with the enhancement of their AVSEC Programmes.

**DRAFT
CONCLUSION 5/3 ICAO MACHINE READABLE TRAVEL DOCUMENT (MRTD)
TRAINING INITIATIVE**

That ICAO:

- a) study the possibility of establishing a course for Machine Readable Travel Documents (MRTD) using the TRAINAIR methodology and in coordination with the Security and Facilitation Branch; and
- b) develop an Aviation Security Training Package for MRTD to assist States in its implementation.

**DRAFT
CONCLUSION 5/4² HOLD BAGGAGE SCREENING (HBS) GUIDANCE MATERIAL**

That the AVSEC/HBS/TF/1 Final Report, included as **Appendix B** to this part of the Report³ be sent to the ICAO CAD Section in order to consider the incorporation of the technical parts within the report in the Security Manual (Doc 8973) as guidance material.

¹ Pre-approved by GREPECAS Members on 15 September 2006.

² Pre-approved by GREPECAS Members on 15 September 2006.

³ Refer to the GREPECAS AVSEC/COMM AVSEC/HBS/TF/1 report, available at GREPECAS website: www.lima.icao.int GREPECAS (username: carsamrpg; password: ccretkode).

**DRAFT
CONCLUSION 5/5**

**IDENTIFICATION OF COMMON CRITERIA IN QUALITY
CONTROL PROGRAMMES**

That ICAO study the feasibility of implementing a secure website for the States to share their Quality Control Programmes with other States.

**DRAFT
CONCLUSION 5/7**

CARGO SECURITY PROGRAMME WORKSHOP

That ICAO develop a Cargo Security Workshop as a matter of urgency to assist States in the development of their National Cargo Security Programme.

**DRAFT
CONCLUSION 5/11⁴**

PASSENGER/CABIN BAGGAGE SCREENING SEMINAR

That ICAO consult with other States and Organizations to support the Passenger/Cabin Baggage Seminar/Meeting scheduled to be held in Montego Bay, Jamaica, from 13 to 17 November 2006, which would provide States with current information on screening techniques and advance technology.

**DRAFT
CONCLUSION 5/12⁵**

AVSEC POINT OF CONTACT (PoC) NETWORK

That the States:

- a) review the criteria and designate the appropriate authority to receive imminent threats to civil air transport operations through this Network;
- b) before **30 September 2006**, sign up with ICAO, using the appropriate form, for the Aviation Security Point of Contact (PoC) Network.

⁴ Pre-approved by GREPECAS Members on 15 September 2006.

⁵ Pre-approved by GREPECAS Members on 15 September 2006.

APPENDIX B

**HBS TASK FORCE
ACTION PLAN PROPOSAL FOR REGIONAL AVSEC EQUIPMENT NEGOTIATION,
ACQUISITION, PARTS, MAINTENANCE, TRAINING**

No.	ACTION ITEM	PROPOSED ACTION(S)	ACTION OFFICE	COMPLETION TIMELINE	CONSTRAINTS	IMPLEMENTATION DATE(S)
1.	Formation of Regional Committee(s)	<p>1. Obtain ICAO agreement for involvement in setting up & assisting in the formation of a Regional Committee for AVSEC equipment negotiation and acquisition.</p> <p>2. Promulgate HBS system research and proposal for Regional negotiation and acquisition of AVSEC screening equipment.</p> <p>3. Letter to ICAO registered State Authorities responsible for AVSEC in the CAR/SAM/NAM Regions requesting formal acceptance of the Regional proposal by a set date.</p> <p>4. Identify and decide on a central location(s) to hold meeting(s) of the interested States, to select persons to sit on the committee (Committee to comprise of or have available: AVSEC specialists, certified screening equipment technicians, an int'l aviation lawyer, a financial expert/negotiator, consultant versed in HBS screening systems & airport design).</p> <p>5. Committee should request manufacturers to include the Regional Committee when advising States and companies of screening equipment upgrades or modifications.</p> <p>6. Consider a sub-committee to assist States that lack technical expertise to determine their needed HBS screening system based on the accepted standard of peak passenger bag throughput plus 30.</p> <p>7. (a) Recommendations of the sub-committee goes directly to the Regional Committee who forwards the proposal to the State's Authority that is responsible for aviation security, with a copy to the relevant airport operator(s). (b) This proposal includes all financial and operational details for State's to make informed decisions.</p>				

No.	ACTION ITEM	PROPOSED ACTION(S)	ACTION OFFICE	COMPLETION TIMELINE	CONSTRAINTS	IMPLEMENTATION DATE(S)
2.	Screening Equipment Manufacturers	<ol style="list-style-type: none"> 1. Establish a list with contact information of screening equipment manufacturers for each type of equipment: conventional X-ray, ATX, EDS, ETD, WTMD, HHMD. 2. Establish list of conveyor providers, contact information and cost for each. 3. Obtain maintenance costs for procurement, depreciation costs, lifespan of the equipment till withdrawn from service. 4. Obtain equipment upgrade capability information and how purchasers are alerted, including costs. 5. In negotiations, factor in the need for equipment redundancy to ensure standards are maintained at all times. 6. New equipment technology and proposed timelines for obtaining State certification should be obtained. <p>Note: Factor in equipment weight and size and the possible need to have airport expansion plans to facilitate the HBS system.</p>				
3.	Security Equipment Maintenance	<ol style="list-style-type: none"> 1. Establish a model maintenance training programme. 2. Establish a model equipment maintenance programme. 3. Establish a model preventive maintenance programme to minimize equipment failure. 4. Establish a model sub-contractors contract detailing requirements for airport operators that don't have personnel for in-house maintenance. 5. Establish a model equipment service record keeping form(s). 6. Establish a "parts inventory" of replacement equipment model <p>Note: A Regional data base should be established to track equipment parts with a high replacement need, manufacturer's timeline for order and delivery of replacements.</p>				

No.	ACTION ITEM	PROPOSED ACTION(S)	ACTION OFFICE	COMPLETION TIMELINE	CONSTRAINTS	IMPLEMENTATION DATE(S)
4.	Screening Equipment Operational Test Pieces	<ol style="list-style-type: none"> 1. Identify the type of Operational Test Pieces (OTP) that are available from each manufacturer. 2. Obtain manufacturers manual on how the equipment is to be used. 3. Obtain cost of purchasing additional OTP or combined test piece equipment. 4. Consider drafting guidance or standards that States, without technical expertise can use to establish and meet calibration, testing and increase threat level standards. 				
5.	Security Equipment Training	<ol style="list-style-type: none"> 1. Determine <u>ideal</u> number of staff needed for the implementation of various HBS screening systems for small/medium/large airports: That is: <ol style="list-style-type: none"> (a) fully automated HBS system; (b) automated system linked with airport CCTV systems; (c) manual system 2. Show the pros and cons for staffing each system. 3. Show the Committee recommendation(s) for type of system and staffing. 4. Show training times for each equipment, who provides the training, who approves the training, etc. 5. Consider developing or having ICAO develop a model equipment training programme. 				
6.	Airports (small/medium/large) with HBS Systems	<ol style="list-style-type: none"> 1. Establish a list of airports meeting the IATA categorization for small/medium/large that recently implemented a HBS screening system. 2. Establish contact persons, etc. with these airports and determine the pros and cons of each equipment type in the operational environment. 3. Determine the equipment training syllabi and times that is given by each manufacturer. 4. Query any negotiated omissions that could have been helpful to the airport. 5. Query airport expansion needs based on the type(s) of equipment being installed. 6. Query electrical voltage needs & impact for contingency planning. 				

**ANALYSIS OF THE ACTION PLAN PROPOSAL FOR REGIONAL AVSEC EQUIPMENT
NEGOTIATION, ACQUISITION, PARTS, MAINTENANCE, TRAINING**

The Ad Hoc Group for Hold Baggage Screening was chaired by ACSA (COCESNA), and supported by Argentina, Canada, Colombia, Jamaica, Peru and IATA. The Group validated six action items on the proposed action plan which contained 1) Formation of Regional Committee, 2) Security Equipment Manufactures, 3) Security Equipment Maintenance, 4) Screening Equipment Operational Test Pieces, 5) Security Equipment Training and 6) Airports with HBS Systems (small, medium and large operations).

Item 1) Committee

The Group suggested that the LACAC Working Group together with AVSEC/COMM jointly prepare the HBS Report and Chile volunteered to coordinate matters between the both groups. The Group agreed that the States should be provided with information on the Group of Experts on Aviation Safety, Security and Assistance (GEASA) www.itho-gespaa.org/es/plantilla.htm, to facilitate information on equipment, acquisition of equipment and funding.

Item 2) Manufacturers, 3) Maintenance, and 5) Training

The Group recommended that that the HBS Task Force provide a list of HBS manufacturers to States, include parameters on the maintenance contract in the NCASP, States accept the state of manufacture certification or provide their own certification to be incorporated into the NCASP.

Item 4) Test Pieces

The Group noted that LACAC Group had an established group to purchase equipment which include test pieces from the manufacturers.

Item 6) Airport Categories

The Group recommended that the States use IATA's matrix for Category A, B and C which using the "Peak Baggage through Put Plus 30" concept.

APPENDIX C

HBS SYSTEMS

1.1 Conventional x-ray equipment

1.1.1 More recently X-ray equipment has increased imaging and detection capabilities and is now used more widely. Hold baggage X-ray equipment is a fast and convenient way of seeing inside without the need to unpack or damage items, as well as, unnecessarily aggravating the already anxious traveller.

1.1.2 The equipment can be bought with various tunnel sizes depending on the types of X-ray screening to be conducted, such as, passenger carry-on baggage, hold baggage and air cargo. This flexible capability allows most objects to be passed through the equipment and produce an X-ray image.

1.1.3 In all modern equipment, independent of size, the image is built up using the linescan principle. As the baggage passes through the tunnel of the X-ray system, the conveyor moves at a constant speed and as each portion of the bag passes through the X-ray beam its image is taken and stored. The image is built up and panned onto the display monitor.

1.1.4 Nearly all modern baggage X-ray equipment has the capability to display material types in different colours. Typically, some explosives, drugs, etc. are displayed in orange; metals such as steel and copper are displayed in blue; and a mixture of organic and metallic, as well as, aluminium and glass are displayed in green. Some items like thick metal absorb a lot of the X-rays and appear black on the image. The indication of the material type helps the system operator decide if certain objects present a threat or could be potential contraband.

1.1.5 Nearly all baggage X-ray equipment and explosive detection systems have several built-in image enhancement features that help the operator to examine the image more effectively. These features allow the operator to modify the contrast of the image allowing it to be tuned for viewing light or dark regions; edge enhancements can be used to define things like wires; and it is possible to view just the organic content or non-organic content. Individual manufacturers will have a range of such features available and more. These can be specified and set on the equipment control console depending on the equipment's intended use.

1.1.6 As with any X-ray system, detection depends on the operator's ability to recognize the components of a bomb, therefore, operators must be given suitable training.

1.2 Advanced Technology Systems

1.2.1 Advancements in X-ray screening technology is steadily improving so that conventional X-rays have been superseded by Advanced Technology (AT) X-ray systems. AT X-ray systems process bags at a high rate and make explosive detection decisions by the addition of Computed tomography of the X-ray (CTX) image. Some AT systems use multiple transmission views and dual energy to help with the explosive detection decisions.

1.2.2 AT is usually placed at Level 1 of an in-line hold baggage screening system which is completely automated. The “Bags per hour (Bags/h) throughput” ranges from a high of 1,800 bags/h to a low of 1,500 bags/h. Manual feed of the bags for X-ray screening, if used as a stand-alone in an airport lobby or basement is drastically reduced to approximately, 160 bags/h. The stand-alone equipment or manual system is labour intensive, slow, and prone to contributing to personnel injuries from their having to lift heavy bags.

1.2.3 This type of equipment cost can run from a high of US\$800,000 to 900,000 – 1800 bags/h with multi-view/dual energy, or a low of US\$400,000 – 160 bags/h, manual operation. An AT system with dual energy alone can cost between US\$350,000 – 1500 bags/h to a low of US\$250,000 – 1800 bags/h.

1.3 Explosive Detection Systems (EDS)

1.3.1 Some types of baggage X-ray equipment are known as explosive detection systems (EDS). This category of system can discriminate, to a degree, between explosives and other materials and indicate this visually, by a number of means, to the operator. These systems, when used in the airport in-line hold baggage screening system, are operated in the “automatic mode” where a detection of an explosive-like material in a bag will activate a diverter and allow the image to be examined by an operator.

1.3.2 These systems are extremely heavy, and costly starting from a high of US\$1.5 million with a 600 bag/h throughput to a low of US\$1 million with a 300/350 bags/h throughput, dependent on the manufacturer. These machines weigh approximately 10,000 pounds and large, measuring on average 24' x 6' x 6'. The advantage of using an EDS over Explosive Trace Detection (ETD) machine is that the threat detection is automated and their throughput rate is much higher. The EDS, however, produces higher false alarms and operators must resolve those alarms by either using on-screen alarm resolution or by using ETD.

1.3.3 Thus far, there is one manufacturer that has recently produced and obtained TSA certification for an EDS which is smaller, light weight, less expensive and uses dual energy and computed tomography. This recently produced EDS costs between US\$300,000-400,000 with a 100 bag/h throughput. Additional advantages of this EDS includes the ability to be used in an automated system as well as a stand-alone unit, needs no airport structural strengthening of floors and runs on single phase power.

1.4 Trace Detection

1.4.1 Trace Detection equipment is capable of detecting explosives and drugs from the vapours they give off or the particulate traces spread when they are handled. As some explosives and drugs are more volatile than others, vapour detection is more appropriate to some materials while trace detection is more appropriate for others. Plastic explosives, for example, are best detected sampling particulate traces.

1.4.2 It is important to note that vapour detecting equipment relies on the presence of explosive vapour and is not capable of detecting explosives which do not vaporize, or if the vapour is contained.

1.4.3 There are three main components in the process when using a vapour and trace detector, which includes: the sampling through vapour gathering or searching for particulate traces by wiping surfaces with a small piece of paper or cloth; an analytical system; and the data processing system which is carried out automatically by computer software which allows an alarm to be generated and the type of drug or explosive to be indicated.

1.4.4 False alarms can occur from a non-target substance, however, it must be noted that the effect of raising the detection threshold is to reduce sensitivity, decreasing both false alarms and detection performance.

1.4.5 Whichever analysis technique is selected, it needs to be able to cope with the dirt and debris that is collected along with any explosive or drugs traces. It needs to be sensitive enough to detect very small quantities of any explosive or drug that are available in many operational scenarios.

1.4.6 Generally, drugs and explosives are too different to allow the same instrument to detect them at the same time. It was noted, however, that ion mobility spectroscopy-based instruments can often be fairly easily switched from explosives detection to drugs detection.

1.4.7 Several companies offer trace detection equipment that are capable of narcotic and explosive detection. They range in cost from as high as US\$60,000 to as low as US\$29,000 and all have a 30-60 bag/h throughput.

1.5 Equipment Maintenance

1.5.1 The correct maintenance of explosive detection equipment is essential if the equipment is to continue to provide the ultimate detection capabilities it is designed for. Maintenance will keep the operational integrity of equipment and ensure a constant performance level.

1.5.2 A strict maintenance management programme should be implemented and adhered to. The programme should include the preventive maintenance schedule to minimize equipment failure through periodic and systematic equipment inspections. Corrective maintenance should also be conducted to repair or remedy any failure, incident or accident that has adversely affected the functioning of the equipment.

1.5.3 Technicians trained and equipped by the manufacturer of the equipment are to be used to conduct maintenance in keeping with the manufacturer's instructions and guidance. Ideally, a maintenance training programme should be included in the sales contract for the equipment, with its content and duration forming part of the initial contract specifications. Where an airport does not have personnel or material resources to organize in-house equipment maintenance, use should be made of a sub-contractor bound by a maintenance contract which includes: a warranty period for the equipment, components, repair work and parts; a minimum response time between the time of the call and the arrival of trained technicians on site; a maximum permissible equipment down time; a preventive maintenance inspection programme (nature and description of associated warranties); identification of the subcontractor's suitably trained and accredited maintenance personnel; and equipment manufacturer's certification issued to the subcontractor and associated warranties.

1.5.4 Equipment service records need to be maintained in keeping with international practices and local laws. A parts inventory of replacement equipment is also required as this will effectively reduce the equipment down time.

1.5.5 Equipment maintenance costs must be factored into the procurement of security equipment systems. The manufacturer and other users of the equipment should be contacted regarding the level of investment needed to ensure the equipment remains serviceable and operationally effective. Provision should be made for the depreciation costs with the expected lifespan of the equipment until it is withdrawn from service or becomes technologically obsolete.

1.5.6 With the rapid growth in technology, security equipment manufacturers usually advise operators and the State's civil aviation authority about modifications or improvements that they have made to their equipment.

1.6 Research & New Development

1.6.1 Manufacturers and States that certify security screening equipment for hold baggage are constantly working to improve the equipment capabilities. Through the United States Transportation Security Administration (TSA) research and development, a software upgrade that enhances the capability of one manufacturer's EDS received certification in 2005. The upgrade provides improved detection, increased throughput capacity, improved reliability and reduced false alarm rates. As mentioned before, another manufacturer has received TSA certification for a lighter, and smaller EDS machine.

1.6.2 In looking ahead, both the United States and Canada are conducting research for improving technology in security-related areas. In the area of screening equipment, upgrades to provide improved detection, increased baggage throughput capacity, improved reliability and reduce false alarm rates are presently being achieved.

1.6.3 Emerging and revolutionary new technologies for the "New Generation" equipment are being encouraged and industry and academia are being challenged to apply innovation in the development of new screening systems. This is a long-term project that would not be deployable in the immediate future.

1.7 Draft Conclusions

1.7.1 A Regional approach to hold baggage screening equipment acquisition is proposed. This can be achieved through the umbrella of the International Civil Aviation Organization (ICAO) to which our States are contracted members. Through the ICAO Technical Cooperation Bureau, screening equipment can be purchased at reduced costs because of the organizations link with the United Nations. It is perceived that with ICAO assistance this facility can be further extended to the Regional acquisition of security screening equipment. If at all possible, this should mean an additional reduction in equipment acquisition costs.

1.7.2 To achieve this end, consideration should be given to establishing Regional Aviation Security Screening Equipment Acquisition Committees in the respective Regions. These Committees should be comprised of, or have available to the committee, AVSEC specialists, certified screening equipment technicians, an international aviation lawyer, a financial expert, and possibly a consultant who is versed in all aspects of hold baggage screening systems and airport design.

1.7.3 A negotiating strategy, central, easily accessible location for meetings and establishment of equipment supplier's Regional office for ease of obtaining replacement parts or gaining service assistance should also be considered.

1.7.4 A sub-committee could possibly be formed to assist States that lack equipment expertise in determining their equipment needs. They could also formulate the proposals that would go from the official Acquisition Committee to the authority responsible to ICAO for civil aviation in the State.

1.8 The most critical aviation security issues facing States today is the quickly approaching deadline for 100% percent hold baggage screening, which is to be implemented by January 1st 2006. The requirement is a result of Amendment 10 to Annex 17 and the expectation is to meet this requirement by employing realistic, reliable mechanisms for screening every bag that is loaded onto an originating international passenger flight.

1.8.1 The challenge is to ensure that the most effective means of baggage screening is used to protect the traveling public. States should be encouraged to consider the probability of detection when evaluating the various means available to achieve 100% hold baggage screening.

1.8.2 Besides that, States from South America and the Caribbean face serious budget constraints that lead them to search for a solution to achieve 100% hold baggage screening that fits with their particular problems. In order to help States choose the best technology available to be implemented, the discussion below presents an overview of each way or technique to best perform this task.

1.9 Hold Baggage Screening Techniques

1.9.1 The screening of hold baggage is a challenging process requiring a high commitment of manpower and resources to detect a small quantity of explosives that may be well concealed among the millions of hold bags that are flown daily.

1.9.2 As defined in Annex 17, the screening process means the use of "technical or other means" to detect prohibited items in hold baggage. This definition is very broad and allows different interpretations. Different types of equipment and methods, such as, Conventional X-ray, canines, Advanced Technology (AT) X-ray, Explosive Detection Systems (EDS), Explosive Trace Detection (ETD), physical searches which depend on high manpower usage, and Computer Tomography (CT) meet the requirements.

1.9.3. As mentioned before, even with the severe financial limitations of the Regions, it is strongly recommended that the adopted solution can provide the warrantee with its effectiveness. Below is an overview of the various technical options available to States with a discussion of their respective strengths and weaknesses. **Attachments 1, 2 and 3** show some equipment used in screening, carry-on baggage, hold baggage and people, respectively, and their characteristics.

1.10 Conventional and Dual Energy (Colour) X-ray Equipment

1.10.1 The use of Conventional X-ray equipment to screen hold baggage continues and is much improved from its development in the 1970s. Dual-energy X-ray models use dual levels of X-Ray energy to distinguish organic materials (low atomic number) that may be explosives from inorganic materials (higher atomic numbers and display each in a different colour. Thick objects that are not fully penetrated are identified to the screener in third colour (typically black). The specific colours used can vary between equipment manufacturers. Some X-rays add Computed tomography (CT) which provides maximum sensitivity and accuracy for material detection and identification. CT can be used to specifically identify explosives and discriminate them from most other innocuous materials. CT images also have improved density resolution compared to Conventional X-ray images. The disadvantages of present CT system designs are their complexity, very high cost, higher package X-ray dose (current models are not film safe) compared to Conventional X-ray and slower operation.

1.10.2 Although advances in technology make it easier to separate metallic clutter from the subtler image of a bomb, the limitations of Conventional X-ray technology remains significant and its use as the main tool to protect civil aviation is limited.

1.10.3 Unlike weapons, bombs have no pre-determined shape. The challenge facing regulators is that the hold baggage screening process is dependent on the training, motivation, perception, and vigilance of the screeners. Performance of the screening system is difficult to measure, and unannounced, random testing often reveals that the system does not attain a level of effectiveness needed to detect explosives. The use of this option as a stand-alone system is not recommended.

1.11 Explosive Trace Detection (ETD)

1.11.1 In the late 1990s, Canada, the United Kingdom, and the United States conducted tests on the expected contamination levels when a careful terrorist builds a bomb, conceals it in an object designed to evade visual inspection, and places the object in a hold bag.

1.11.2 Based on lessons learned from these tests and situations in which explosive trace detection is used for primary screening, the United States devised a strategy that requires a certain portion (percentage) of bags to be inspected on the exterior only; another portion (percentage) of bags to be inspected on both the exterior and interior; and, another portion requiring a complete screening of all objects large enough to conceal a bomb. High labour costs and slow processing times of explosive trace detection equipment limit this mixed strategy.

1.11.3 The challenge is not the speed of the equipment, which provides detection and the identification of the explosive in ten seconds, but rather in bag handling and sample acquisition by the screener. Experts have found that if the sampling process is not done systematically, detections will be missed.

1.11.4 The major trace detection technology involves detection by the technology Ion Mobility Spectrometry (IMS). The collection and analysis of minute, invisible amounts of organic material, called traces, that are microscopic amounts left through contamination or direct contact with explosives. A sample of interest is heated and vaporized; positive and negative ions are formed. Ions of the corresponding polarity are allowed to move into the drift region. The various ions travel at different, but characteristic, speeds according to the ions weight and size. The time required for ions to drift down the tube is precisely known and pre-programmed. So, target substances are detected and identified.

1.11.5 One example of the explosive trace detection using IMS is the Itemiser 3, from General Electric (GE), with a switching system that delivers simultaneous positive and negative ion detection from a single sample for the most comprehensive explosives and narcotics detection available. It achieves this through a proprietary ion “trap” that increases ionisation efficiency, the main factor determining detection sensitivity.

1.11.6 Traditional IMS instruments operate, in general, in either positive or negative mode, but not both modes simultaneously. While negative mode operation detects the majority of explosives, peroxide explosives (TATP) are among the substances more readily detected in positive mode. Therefore to rule out the presence an expanded list of target explosives, conventional IMS detectors require operators to sample and test in one mode, then switch modes and resample and test again.

1.11.7 Another example of ITMS is the VaporTracer2, from GE, where vapours are drawn through a nozzle directly into the detector for analysis or by a detachable vacuum sample wand draws vapours into a sponge-like sample trap, which is then inserted into the equipment for analysis. (RDX and PETN have very low vapour, and are hard to detect with this equipment).

1.11.8 ETD technology should be considered as a complementary tool and its use may be recommended as a second or third technical means to increase the effectiveness of the hold baggage screening process.

1.11.9 The table below shows some available equipment:

Table 1 - Trace Detection Equipment

Model	Company	Technology	Detection	Estimated Bags/h	Estimated Price US\$ x 1,000
Itemiser3	GE	Ion Trap Mobility Spectrometer (ITMS)	Narcotics and Explosives	30-60	45
VaporTracer2	GE	Ion Trap Mobility Spectrometer (ITMS)	Narcotics and Explosives	30-60	29
Ionscan 400B	Smith Detection	Ion Trap Mobility Spectrometer (ITMS)	Narcotics and Explosives	30-60	50
Ionscan 500DT	Smith Detection	Ion Trap Mobility Spectrometer (ITMS)	Narcotics and Explosives	30-60	60
Defender	Thermo Electron	High Speed Gas Chromatography with Differential IMS	Narcotics and Explosives	30-60	60

1.11.10 Advanced Technology (AT) Systems

1.11.10.1 Equipment manufacturers have developed Advanced Technology (AT) X-ray systems that process bags at a high rate and make explosive detection decisions by the addition of Computer Tomography of the X-Ray (CTX) image. Several equipment manufacturers have attempted to achieve automated detection with AT.

1.11.10.2 Note that the term Advanced Technology as used in this paper does not infer that the equipment has been purchased or approved by any state and in particular, should not be confused with same term when used to describe equipment purchased several years ago by the US Federal Aviation Administration for use at US airports.

1.11.10.3 Some of the AT systems employ multiple transmission views and dual energy to help with the explosive detection decisions. Several States have deployed these AT systems as the first level of hold baggage screening followed by on-screen alarm resolution and certified EDS Computed Tomography-based technology.

1.11.10.4 The United States has repeatedly tested this technology and determined that it does not meet the U.S. detection standards for all threat explosive categories. The vulnerability created by undetected critical threats leaves an exploitable gap in explosive detection. A system relying on AT as the first stage contains this vulnerability.

1.11.10.5 Generally, X-ray devices operate by passing X-rays through screened items and projecting an image of the contents being examined on a monitor. Potentially explosive materials are identified by their density, average atomic number, and appearance. The detection capabilities of these devices vary in terms of how the X-ray systems function - for example, by providing cross-sectional images or by using “reflected” energies know as backscatter. The devices also vary in terms of whether the presence of potential explosives is signalled by an automatic alarm or is manually identified by an operator.

1.11.10.6 The use of Advance Technology X-ray as the main resource in the screening process should be considered. The use of AT equipment in conjunction with an ETD, for “small” and “medium” airports, can be a good option that meets Annex 17 requirements. Besides that, airports categorized as “large”, with their high volume of passenger/baggage traffic can use AT X-ray at Level 1 of the five levels of hold baggage screening.

Table 2 - Advanced Technology Systems

Model	Company	Technology	Detection	Bags/h	Estimated Price (US\$ x 1,000)
MVT	L-3	Multi-View (3) Dual energy	Explosives	1,800	800-900
Vivid VIS 108	L-3	Dual energy	Explosives	1,800	250
10080EDS	Smith Detection	Dual energy	Explosives	1,500	300-350
EdtS (Fixed CT – 5 Views)	Smith Detection	Multi-View (5) Dual energy	Explosives	1,800	800-900
10080 EDS-2is	Smith Detection	Multi-View (2) Dual energy	Explosives	1,500	500-600
XRD1000	Rapiscan	Multi-View (2) Dual energy	Explosives	Manual 160	400
MVXR5000	Rapiscan	Multi-View (5) Dual energy	Explosives	1,800	700-800

*Note: Bags per hour (b/hr) is the manufacturers stated maximum when the bags are inserted at an optimal (automatic) rate. Optimal b/hr throughputs depend upon the feed mechanism. (i.e. The AT is integrated into an in-line baggage handling system) The b/hr throughput for bags that are manually fed into AT machine is less than one half of the figures cited.

1.11.11 Explosive Detection Systems (EDS)

1.11.11.1 Several States have adopted Computed Tomography (CT) based automated EDS as the primary method of screening hold baggage. EDS provides a high level of detection across the total threat base coupled with an operationally manageable false alarm rate.

1.11.11.2 The machines are heavy, large, expensive, and generally can be integrated into the baggage handling system to operate most efficiently. Regardless, the deployed systems have been operating reliably and do provide the highest level of protection to the travellers.

1.11.11.3 Some States include certified EDS technology within their baggage screening systems to resolve un-cleared alarms from AT and screener on screen alarm resolution. The problem with this approach is that the level one technology may have any number of missed detections, which could proceed to the aircraft. This must be a risk-based decision made by States recognizing no system has 100% detection.

1.11.11.4 Several States are conducting research and testing to identify more effective and efficient approaches to screening hold baggage and to expand the list of threats addressed. They are exploring combinations of innovative and new technologies.

1.11.11.5 The use of most EDS technology as stand-alone screening equipment in the airport lobby has great financial and operational implications due to the low number of bags that it is possible to screen per hour. This leads to the necessity to have a significant number of EDS units in the airport, which can be extremely expensive and reduce lobby space. The best use of EDS technology is as a supplementary tool, mainly for airports with a high volume of traffic, as a part of a complex and expensive five-level HBS screening system.

1.11.11.6 For medium airports, the new lighter and less costly EDS equipment should be considered as a viable option.

Table 3 - Explosive Detection Systems (Currently US FAA/TSA Certified)

Model	Company	Technology	Detection	Estimated Bags/h	Estimated Price US\$ x 1,000
Examiner 3Dx6500 and 3Dx6000	L-3	CT	Explosives	Up to 600	1,100-1,300
CTX9000 DSI	GE	CT	Explosives	542	1,400
CTX5500 DS	GE	CT	Explosives	-	1,000
CTX2500	GE	CT	Explosives	Manual	Greater than 700
Yxlon 3000	GE	Coherent X-ray Scatter	Explosives	60-80	Greater than 1,500
Yxlon 3500	GE	Coherent X-ray Scatter	Explosives	60-80	Greater than 1,500
Exact 6400	Analogic	Dual Energy CT	Explosives	600	Greater Than 1,000
CT-80	Reveal	Dual Energy CT	Explosives	100	300-400

*Note: Bags per hour (b/hr) is the manufacturers stated maximum when the bags are inserted at an optimal (automatic) rate. Optimal b/hr throughputs depend upon the feed mechanism. (i.e. The EDS is integrated into an in-line baggage handling system) The b/hr throughput for bags that are manually fed into EDS machine is less than one half of the figures cited.

1.11.12 **Research Development**

1.11.12.1 The hold baggage screening equipment technologies already presented are undergoing improvements to provide improved detection, increased throughput capacity, improved reliability and reduced false alarm rates. Other technology being developed by some countries, such as Argentina and Russia, is based on Quadrupole Resonance Analysis (QRA).

1.11.12.2 QRA is a technique related to magnetic resonance imaging (MRI) used in hospitals. QRA, unlike MRI, uses low intensity tuned radio frequency pulses to probe for the molecular structure of the target materials. Although QRA is a precise technique, it is limited to detecting a small range of explosives and does not produce an image, so it must be used in conjunction with Conventional X-ray imaging systems or manual/physical search. The advantage of QRA is that the configuration of the explosive, whether in bulk, sheet, distributed, etc. is irrelevant to detection and there is no performance degradation when detecting thin explosives. The primary disadvantage of the QRA method is the inability to detect materials enclosed in a metal container or foil. Iron or large amounts of non-ferrous metals in a package cause field distortion and reduce effectiveness.

1.11.13 **Recommendation**

1.11.13.1 At last, we recommend that the group should consider for discussion the following proposal:

As described during the paper, many issues should be considered in making a decision regarding the type of HBS screening system that is required and justified for the individual airport. However, one of the most important aspects is related to the effectiveness of the option selected. Considering the Mexico presentation at the HBS Seminar, as a preliminary step we recommend the following options for an international airport with:

- (average of the top 30 annual peak-hour passengers) ≤ 250
The use of a Conventional X-Ray, ETD and/or pre-established random physical search.
- (average of the top 30 annual peak-hour passengers) > 250
The use of AT, CTS and ETD automated system and pre-established some random physical search; or
- The use of CTX and ETD on an automated system and pre-established some random physical search.

1.11.13.2 Because of the challenge of screening 100% hold baggage, the actual choice of systems must be based on a detailed airport evaluation, to include: establishment of the peak baggage throughput plus 30, aircraft sizes, baggage characteristics, including possible seasonal variations, etc. which may modify the basic recommendations.

ATTACHMENT 1 – BAGGAGE CARRY-ON

Baggage Carry-on				
TRACE				
Use/Technology	Type	COMPANY	Status/Applicability	Comments
IMS	Desktop	GE, Smiths,	most deployed, mature technology	-
	Handheld	GE, Smiths,	less applicable	sensitivity and selectivity
GC	Desktop	Thermal Detection	COTS but limited deployment	-
MS	Desktop	Hitachi	COTS but emerging	-
BULK DETECTION				
Use/Technology	Type	COMPANY	Status/Applicability	Comments
X-Ray	B&W	Various	Not applicable	has no materials discrimination
-	Dual Energy	Smiths, L3, Rapiscan, Guillardoni	strong deployment	-
AT DUAL ENERGY				
Use/Technology	Type	COMPANY	Status/Applicability	Comments
-	single view	L3	size an issue, not normally deployed for this use	-
-	multi-view	L3, Smiths	size an issue, not normally deployed for this use	-
CT X-Ray	single energy	GE, L3	size an issue, not normally deployed for this use	-
-	dual energy	Analogic, L3, Reveal	size an issue, not normally deployed for this use	-
-	Non-rotating	Securescan	size an issue, not normally deployed for this use	-
QR	-	Rapiscan, G E, Argentina	emerging, limited pilot project deployment	some new models emerging coupled with dual energy X-ray for enhancing carry-on screening

ATTACHMENT 2 – HOLD BAGGAGE

Hold baggage				
TRACE				
Use/Technology	Type	COMPANY	Status/Applicability	Comments
IMS	Desktop	GE, Smiths,	deployed to enhance security value of dual energy and AT X-ray	Frequently used at level 4/5 of multi-level systems to assist in resolution of uncleared bags
-	Handheld	GE, Smiths,	less applicable	sensitivity and selectivity
GC	Desktop	Thermal Detection	COTS but limited deployment	-
MS	Desktop	Hitachi	emerging but COTS	-
BULK DETECTION				
Use/Technology	Type	COMPANY	Status/Applicability	Comments
X-Ray	B&W	various	Not applicable	no materials discrimination
	Dual Energy	Smiths, L3, Rapiscan, Guilardoni ...	some deployment for HBS but usually with some additional hand search and trace detection	on its own has limited explosives detection capability
AT DUAL ENERGY				
Use/Technology	Type	COMPANY	Status/Applicability	Comments
-	single view	L3, (Smiths?)	deployed quite widely	"older" technology
-	multi-view	L3, Smiths	newer, enhanced performance	
CT X-Ray	single energy	GE, L3		
-	dual energy	Analogic, L3, Reveal	newly COTS, being deployed	better image clarity, lower threat weight detection, better materials selectivity
-	Non-rotating	Securescan	under development	performance specs not known
QR	-	-	emerging, limited pilot project deployment	normally good for detection of RDX and PETN, other explosives can be very problematic. May not provide location data for alarm resolution

ATTACHMENT 3 – PEOPLE SCREENING

PEOPLE SCREENING			
PORTALS			
Type	COMPANY	Status/Applicability	Comments
trace	GE, L3	emerging, pilot deployments	limited throughput, so normally selectee screening only, size an issue
X-Ray backscatter	AS&E, Secure 1000	emerging, pilot deployments	limited throughput, so normally selectee screening only, size an issue
millimeter wave	Safe View, Qinetiq	emerging, pilot deployments	limited throughput, so normally selectee screening only, size an issue
terra-hertz	? (UK and US)	under development	-
TRACE			
Type	COMPANY	Status/Applicability	Comments
Document scanner	GE, Smiths,	COTS but emerging, pilot deployment	-
"hand, finger" scanner	GE	COTS but emerging, pilot deployment	-

2. Quality Control of Equipment**2.1 Factory acceptance/site acceptance Tests**

2.1.1 Manufacturers of Hold Baggage Screening Equipment are required to have an objective assessment of their specifications and performance claims through the State of Manufacturer's testing and certification of each piece of equipment before they are offered on the market. The two State standards that are recognized and accepted are the United States Transportation Security Administration (TSA) and European Civil Aviation Committee (ECAC).

2.1.2 Once the screening equipment has been certified, the manufacturer should be asked to confirm in writing that the machine meets the requirements before purchase. Acceptance of the equipment by the purchaser should be dependent on the equipment meeting the requirements when installed.

2.1.3 Upon delivery of the equipment to a prospective purchaser, the manufacturer will conduct site tests. These include calibration of the equipment and testing of the screening equipment using a combined test piece (CTP) supplied by the manufacturer. The purchaser will decide how many "test pieces" they require and order these from the manufacturer. These test pieces are marked with the manufacturer's code and serial number.

2.1.4 Basic training of the purchaser's operators in calibration and testing of the screening equipment upon delivery is a part of the sales and delivery service of such equipment.

2.2 Performance Testing

2.2.1 Presently conventional x-ray equipment is still being used to support hold baggage and other AVSEC screening, supplemented by hand searches. With the rapid advancement in technology, the States and airport authorities have moved to using x-ray screening equipment which incorporates the best features of current technology, leaving scope for further development in their HBS planning designs.

2.2.2 Performance testing of screening equipment by State, airport and air operators is conducted with a CTP to determine whether the x-ray machine meets the standards established by the State of the Manufacturer and/or the State in their AVSEC Quality Assurance programme, in terms of image quality parameters.

2.2.3 During performance testing, both metallic and non-metallic objects are required to be detected

2.3 Routine Performance Tests

2.3.1 A combined test piece (CTP) has been designed for routine testing of x-ray equipment to ensure that performance requirements for x-ray equipment are met and maintained. Both hardware and software tests are required to be conducted daily and weekly, with records maintained by the operators.

2.3.2 The routine test procedure is not intended to be used on x-ray equipment that can detect the presence of explosive material or the components of an explosive device when the machine is used in the fully automatic mode. If the equipment, however, is used so that it requires an operator to make a decision based on an image (indicative mode), this image must be to the same standard as a conventional x-ray machine.

2.4 Draft Conclusion

2.4.1 A Quality Control template for screening equipment testing should be developed to assist States.

2.4.2 The AVSEC/COMM should conduct a quality control workshop in conjunction with ICAO Member States in the NAM/CAR/SAM Regions.

2.5 QUALITY CONTROL

2.5.1 States should develop a Quality Control Programme as a key component in the successful application of civil aviation security measures to ensure that controls are continually applied in a manner that provides effective and sustainable security.

2.5.2 States should ensure that formal written procedures, legislation and regulations are contained in such a programme valid for a period of time determined by the State, after which the State or Operator has to provide the necessary refresher training and recertification of personnel.

2.5.3 Objective

2.5.3.1 States should ensure the effective implementation and administration of aviation security measures. The effectiveness of such a programme should be measured by conducting tests, surveys, audits and inspections.

2.5.4 Recruitment

2.5.4.1 It is necessary to ascertain that the recruit is a suitable character and has sufficient integrity to carry out aviation security duties.

- 2.5.4.2 Background checks:
- Education
 - Previous employer
 - Community
 - Training
 - Criminal Record
 - Physical and Mental Fitness

2.5.5 Training

- Initial training/OJT
- Computer-based training
- Manufacturers training
- Assessment
- Certification – equipment/personnel
- Refresher training
- Re-certification

2.5.6 Security Inspection and Audits for Effectiveness of HBS System

- Inspection
- Security Audits/Surveys
- Testing

2.5.7. Airport Design

- Planning criteria
- Airport Threat and Risk Assessment
- Layout of Facility
- Position of screening equipment
- Support operation – for threats
- Cargo & Mail handling facilities – monitoring 70% on passenger aircraft
- Power-supply (backup) & temperature

2.5.8 Detection Technologies and Equipment

- Health and Safety issues
- Type of explosives and detection sensitivity – privacy issues
- Procurement Consultation
- X-ray detection equipment
- Other forms of detection (dogs) and their certification

2.5.9 Baggage Security

- Off airport check in
- Protection of screened baggage
- Passengers baggage reconciliation and authorization
 - Procedures to ensure that only accompanied baggage and unaccompanied baggage which have been subjected to the necessary controls are loaded onto the aircraft.

2.5.10 Human Factors

- Human Factors – ICAO Doc 9808
- Working Conditions

2.5.11. Conclusion

2.5.11.1 A Quality Control template should be developed to assist States.

2.5.11.2 The AVSEC/COMM should conduct a quality control workshop in conjunction with ICAO Member States in the NAM/CAR/SAM Regions.

3. Conveyor Systems

3.1 General Consideration

3.1.1 In designing the airport in-line system, look at the system that is needed, keeping it simple and including redundancy in the design to ensure that all bags are screened to the same standard, especially when there is equipment down-time.

3.1.2 Research suppliers of conveyor systems before selecting and check all references, as there are several companies available. Be aware that airport consultants might also be able to design a cost effective conveyor system based on the needs of the specific airport.

3.1.3 Ensure that flexibility is built into the system for Explosive Detection Systems (EDS) so that there is adequate spacing between bags. This is based on the average bag size and that provisions are made for over-size or long bags, such as golf bags.

3.1.4 The conveyor system must be able to integrate the different screening equipment used at the five levels of the in-line Hold Baggage Screening (HBS) system.

3.1.5 One person should be made responsible to resolve problems that arise with screening equipment and baggage handling in the HBS system.

3.2 CONVEYOR SYSTEMS - GENERAL CONSIDERATIONS

3.2.1 During the Regional ICAO CAR/SAM Hold Baggage Screening Seminar conducted in Monterey, Mexico from November 28-30, 2005 presentations were given by companies that provide conveyor systems that are currently in use at airports around the world as a part of the in-line hold baggage screening system.

3.2.2 Conveyor Companies

3.2.2.1 The conveyor companies that made presentations included Siemens Conveyor Systems and Glidepath, both providing international services of their conveyor systems. They can assist airports in planning and conceptualizing integration of screening equipment and implementation of hold baggage screening system.

3.2.3 Services

3.2.3.1 The companies offer a wide range of services including baggage management, from check-in to delivery, and connections of the bags. They will assist airports in new terminal development to minimize the impact of baggage screening on the overall airport operations. In the case of existing terminals that tend not to have enough space for the screening equipment and levels of screening required, they will assist the airport in coming up with the solutions to their problems.

3.2.3.2 The conveyor companies provide and stock spare parts for simple conveyors, to more complex systems, such as, carousels used for baggage delivery. High speed conveyor delivery is possible and provided at large airports where bags are moved from one terminal to another in less than 20 minutes so that bags can connect. One of the company's that presented indicated its capability to integrate the passenger and bags at all times through their baggage handling system.

3.2.3.3 Maintenance services are offered and ranges from specialists assistance, software, preventative maintenance and 24-hour emergency assistance. Maintenance response times are, however, dependent on the contract, and the type of maintenance – hardware or software. Conveyor systems are being enhanced with touch screen and graphics to assist the operator who is watching the baggage screening process. These companies have successfully merged the various baggage screening equipment that are used at the different levels during the in-line screening process; systems, such as, L-3, Smiths and G.E. In-vision. They are able to track the bags, in keeping with IATA requirements and provide multiplexing (*different layers of conveyor and tracking systems*).

3.2.3.4 New products, such as a high speed diverter for bags to move from one lane to another along the in-line conveyor system has been introduced by one company. This replaces the use of the "pusher" which was used before and caused damage to a high number of bags. Damage resulted in dissatisfaction to the traveler and replacement costs to the airport/airline operators involved.

3.2.4 Financing & Costs

3.2.4.1 The conveyor companies have the capability to offer its clients financing for all phases of the project.

3.2.4.2 It must be borne in mind that costs are dependent on several factors, such as, the size of the conveyor system, the passenger through put at the airport, the levels of screening, the mix of equipment being used to screen the bags, and the width of the conveyor.

3.2.4.3 When designing a system it is important to note that the IATA standard from check-in to delivery of the bags to the aircraft is 9 minutes. This time can increase from 10-15 minutes, depending on the layout of the baggage screening system.

3.2.5. Factors to Consider

3.2.5.1 When designing an integrated in-line hold baggage screening system, it is important to consider internationally accepted standards for baggage screening time, such as, those established by the Transportation Security Administration and European Civil Aviation Conference.

4. Best Practices by States – Research, Development & Training

4-1 Possible Locations for Hold Baggage Screening & Considerations During Airport Planning Stage

4.1.1 This paper was presented by IATA and attached to it was Section 5 “Possible Locations for Screening of Hold Baggage” and Section 6 “Planning HBS Facilities”. These are extracts from the IATA Position Paper on 100% Hold Baggage Screening.

4.1.2 WP/10 and the comments by States and Consultants are attached to this part of the Report as **Appendices A** and **B** respectively.

4.2 Current Best Practices by States

4.2.1 This was a second paper which gave an overview of the “Best Practices” of States that were presented at the Seminar, and included information gleaned from Mexico and Chile. Transport Canada’s research developments for improving air cargo and mail security, as well as, the performance based approach by IATA which includes the Security Management System (SEMS) were presented.

4.2.2 The lessons learnt by States like Mexico and Spain who had already installed in-line hold baggage systems were invaluable and will assist other States in not making the same mistakes. Some of these considerations included:

- the airport design and planning for the HBS system, must take in all the security considerations;
- equipment selection, climates with extreme cold/heat have to consider this as these temperatures affect equipment performance;
- integration of the various machines so that they all work as required;
- airport installation considerations to include: location, other systems, light, air conditioning for the equipment, fire, elements for down-line maintenance, re-enforcement of the structure to support the equipment;
- motors, etc, were not to be linked to other systems as these will prevent optimum performance of the equipment;
- baggage tray selection was important, they should be of plastic so the material does not set off alarms and the manufacturer has to validate the material of these trays;

- planning for placement of redundancy equipment; and
- preventive, scheduled maintenance should be scheduled for nights to prevent disruption to airport operations and passenger facilitation.

4.3 Research Developments

4.3.1 Air cargo transportation concerns were aired and the new technological research that was being conducted by Transport Canada was discussed. Cargo screening and technology for tracking cargo during its journey is a part of this development. The new research technology for mega Computer Tomography (CT) for cargo would not be ready until another five (5) years.

4.3.2 Research was also being conducted by Transport Canada into security systems that would include access control/physical security using biometrics for personnel. The system would also be capable of operating mechanical access control gates.

4.3.3 It was also brought out during the Seminar and Task Force Meetings that the USA is conducting and advancing research in several areas of technology, such as, in security screening equipment upgrades to provide improved detection, increased baggage throughput capacity, improved reliability and reduced false alarm rates. They are also conducting research and development on the next generation technology solutions to further expand our capabilities to detect weapons and explosives.

4.4 IATA Categorization of Airport Sizes

4.4.1 It was determined from the presentations that during airport planning for the HBS system, the airport size needed to be looked at. IATA has established a categorization for airports which are:

- **Small Airports (under 1 million Passengers p.a)**
- **Medium Airports (1-5 million Passengers p.a)**
- **Large Airports (5 ≥ Million Passengers p.a)**

4.4.2 It was reiterated that the peak baggage throughput plus 30, however, is the primary factor that is used to determine and justify the types of hold baggage security screening equipment that individual airports need. (*Refer to Agenda Item 8 Report "Advantages and Disadvantages of Equipment Technology" for details*)

4.5 BEST PRACTICES BY STATES

4.5.1 During the period November 28 till the 30, 2005 the ICAO Hold Baggages Screening Seminar was held in Monterrey, Mexico. Presentations were made by government agencies, international organizations, manufactures and experts highlighting various concepts of "best practices" approach.

4.5.2 Best Practice Approach

4.5.2.1 It is important to note that in the process of formulating a Best Parctice approach, this will vary from Territory to Territory since it is dependent on :

- Threat levels;
- Airport size (Small, Medium and Large);
- Economic impact;
- Passenger flow (P/Hr and P/Yr);
- High risk Flights;
- Technical and Human support;
- Training demands;
- Oversight mechanism; and
- Management system.

5. RESOURCES

5.1 Funding, Funding Alternatives & Technical Assistance

5.1.1 Project funding and technical expertise are made available to individual States that request assistance from the International Civil Aviation Organization (ICAO) Technical Cooperation Bureau. Both the funding and technical expertise are provided by other Member States of ICAO. Ten per cent of the project funding is retained by the Technical Cooperation Bureau to defray their services.

5.1.2 The ICAO Technical Cooperation mechanism supports Regional initiatives in all areas, including equipment purchase. The Technical Cooperation mechanism extends to international procurement for leasing or purchasing security equipment. The advantages of using this mechanism is that ICAO can control prices, there is transparency, impartiality, and ICAO is committed to pay for the equipment purchased. Money is also saved in costs because of the ICAO link with the United Nations.

5.1.3 The Inter-American Committee on Terrorism/Organization of American States on the other hand primarily provide training, technical assistance and cooperation, in conjunction with other international organizations, such as ICAO. They fund training, fellowships to attend Seminars and Workshops and will also provide funding for certain State assessments and technical assistance.

5.1.4 The International Air Transport Association (IATA), directly or indirectly through tender bids, is able to assist airports to design hold baggage screening (HBS) systems, provide technical support, procure new and modified HBS systems, and provide project management at a cost to the State or airport operator.

5.1.5 Manufacturers/suppliers of HBS and conveyor systems have the capabilities to provide project financing, equipment financing and leasing to respective clients, on a client to client basis.

5.1.6 Assistance is also extended to States and airport operators through the Inter-American Development Bank (IDB) and Multi-lateral Investment Fund (MIF) for strengthening aviation security at national and airport levels. The project is put to international tender and awarded. The disadvantage here is that as a part of this arrangement, the State's security-related documents are required by the bank as proof that the work has been done.

5.2 Consultants

5.2.1 There are internationally recognized consultants of Hold Baggage Screening and Baggage Handling systems that can work with States and/or airport operators. These consultants can provide a range of expertise in the selection and procurement of Explosive Detection Systems, Computer Tomography, Advanced Technology and Explosive Trace Detection Systems, conveyor systems, as well as, providing installation oversight for the project.

5.3 Conclusion

5.3.1 Developing States should strongly support the Regional approach for funding and hold baggage screening equipment acquisition. States should avail themselves of the options that are open to them and be cognizant of the need for proper due diligence in obtaining funding and acquiring services before committing themselves.

5.4 RESOURCES :FUNDING & TECHNICAL ASSISTANCE

5.4.1 During the Regional ICAO CAR/SAM Hold Baggage Screening Seminar conducted in Monterey, Mexico from November 28-30, 2005 presentations were made by the ICAO Technical Corporation Bureau for the Americas and the Inter-American Committee against Terrorism (CICTE), highlighting the financial and technical assistance available to member States for training, scholarships, assessments, technical assistance missions, acquisition of security equipment, technical corporation, project management and financing.

5.4.2. ICAO Technical Corporation Bureau

5.4.2.1 The ICAO Technical Corporation Bureau provides a wide range of technical and financial assistance to member States through its seven regional offices across the globe. These Offices are independent and autonomous in each State and provides staff and equipment to train at local and international levels, human resource development and procurement services to hire or purchase for best conditions.

5.4.2.2 More specifically, the mechanism is pursuant to the Standards and Recommended Practices of Annex 17. It includes help to member States to solve corrective actions identified in the ICAO Universal Audit Security Programme, such as, Annex 17 Standard 4.4.8 – Screening of Hold Baggage, regional and national financing and funding for ICAO ASTP training.

5.4.2.3 The mechanism extends to international procurement for leasing or purchasing Security equipment. Privatized airports within States may benefit from the mechanism with the knowledge of the national authority with responsibility for civil aviation.

5.4.2.4 Technical Cooperation Bureau of ICAO will undertake projects in member States, including total financing from which a percentage is retained for services. Several advantages can be obtained through the use of this mechanism. These include: ICAO controlling prices, transparency, impartiality, and commitment by ICAO to pay for equipment. Also, through the United Nations, money can be saved in costs.

5.4.3 Inter-American Committee on Terrorism / Organization of American States

5.4.3.1 The Inter-American Committee on Terrorism (CICTE) work in collaboration with the Organization of American States and coordinate training and technical assistance through a single point of contact within the State. Primarily, they provide training and technical assistance and international cooperation working with International Organizations such as the ICAO. It noted that these Organizations cannot fund equipment and salaries, but can fund training, fellowships and funding for certain assessments and technical assistance missions.

5.4.4 International Air Transport Association (IATA)

5.4.4.1 International Air Transport Association (IATA) is willing to assist Airports to design HBS Systems and can provide expert technical support, procurement of new and modified HBS Systems, project management and technical oversight of the project and can also develop and implement HBS.

5.4.5 Manufactures of HBS and Conveyor Systems

5.4.5.1 Some manufactures of HBS and Conveyor Systems have the capabilities to provide to their respective clients for project financing, financing and equipment leasing. This facility is made on a client by client basis.

5.4.6 Consultants for Hold Baggage Screening and Baggage Handling Systems

5.4.6.1 States need to be aware of the availability of Consultants who are internationally recognized in the field of Hold Baggage Screening and Baggage Handling Systems. These Consultants can work with States Airport design team to provide a range of expertise in the selection and procurement of EDS/CT, AT and ETD, including installation oversight of the project.

6. ADVANTAGES AND DISADVANTAGES OF HBS EQUIPMENT TECHNOLOGY

6.1 Procurement vs. Rental

6.1.1 Hold Baggage Screening equipment purchase and rental are both available to States, and the relevant option should only be pursued once the appropriate due diligence has been conducted. The options to purchase or rent equipment are available through international organizations, such as ICAO et al and Suppliers of hold baggage screening equipment, on a client by client basis.

6.1.2 It must be borne in mind that should a Regional approach to acquisition of hold baggage and other screening equipment be taken there are the advantages of lowering purchase and maintenance costs, spare parts would be more readily available through the possible relocation of equipment supplier service personnel within the Region for timely repairs. Equipment upgrades and acquisition of new equipment technology should be built into the Regional contracts for States that choose this option.

6.2 Decisions on the Type of Technology to Select & Install

6.2.1 State and airport operators need to look at their individual airports to make a determination regarding the type of technology to be installed. These decisions are based on the passenger baggage through put plus 30 (*the established norm that is used in the industry*).

6.2.2 The decision for equipment technology should be based on the International Air Transportation (IATA) categorization for bags per hour (b/hr) through put:

Category “A” <999b/hr	Manual Sortation, Low technical, Semi-automatic;
Category “B” $\geq 1000 < 4999$ b/hr	Medium/High, Automatic;
Category “C” ≥ 5000 b/hr	High Technology, Fully automatic

6.2.3 A Hold Baggage Screening Solutions decision tree, prepared by Ashcote Consulting is attached as **Attachment** for guidance to States in establishing the type of technology that is needed for their airport.

6.2.4 The decision should be based on: the size of the airport, the long-term plan, to include the existing airport terminal facilities and possible expansion plans; the passenger and baggage through put, projected growth of the airport over the next ten plus years, the likely contents of passenger baggage based on their geographical location and experience, the number and types of equipment needed, including their initial and maintenance financial costs and training needs.

- Category C: an in-line hold baggage system, with five (5) levels of hold baggage screening which integrates different screening equipment technology (AT X-ray, EDS CT) used at different levels, operator viewing stations, conveyor systems and redundancy (extra equipment) for equipment down time. (Suitable for large airports with ≥ 5000 b/hr);
- Category A-B-C: a stand-alone Explosive Detection System (EDS) Computer Tomography (CT) or advanced technology (AT) X-ray which can be installed in the check-in concourse or in the baggage system “downstream” of check in; or
- Category A: other cost effective security measures such as physical hand search and/or Conventional X-ray and Explosive Trace Detection (ETD). (Suitable for low volume locations – small airports <999b/hr).

6.3 Maintenance

6.3.1 It is important to ensure that States factor in the need for scheduled maintenance programmes for their screening equipment, based on the suppliers’ recommendations. Unscheduled maintenance down time should also be borne in mind and, as stated before, the need for redundant screening equipment to be available so that all hold bags are consistently screened to the established standard.

6.3.2 The airport operator should have an inventory of the equipment parts that wear out and require replacement, the availability of spare parts, including the timeframe for delivery of such parts once they become defective should be ascertained during contract negotiations.

6.3.3 Apart from the suppliers’ technicians who may have to be called in for major equipment servicing, as a part of the contract, States should ensure that airport operators acquire training and certification of maintenance personnel that will be responsible for routine scheduled and non-scheduled servicing of the screening equipment. The need for technician up-grade training to match technology changes is to be factored into the negotiations.

6.3.4 All hold baggage screening equipment maintenance schedules and servicing records, including service personnel training records are required to be maintained and be available for inspection.

6.4 Hold Baggage Screening Solutions – Decision Tree

6.4.1 Description for Use

6.4.1.1 Overview

6.4.1.1.1 The ACL decision tree is a simple tool designed to assist member states in focusing on the initial strategic decisions about which screening standards should be adopted at each airport and from this, what alternatives are open for them in terms of practical screening systems.

6.4.2 Application

6.4.2.1 The tree is simply read from left to right beginning at the green Start position.

Step 1 – Destination Traffic Mix. The first branch is a consideration of what are the airports current and future destinations, as the controlling authority there will generally dictate what standard should be applied to inbound flights. If the airport has a mix of flight destinations to differing regions and bags for each cannot be separated, then the highest standard will apply. For instance; if the major routes from an airport are to Asia but a few go to the US and bags cannot be segregated, then step 1 must be USA.

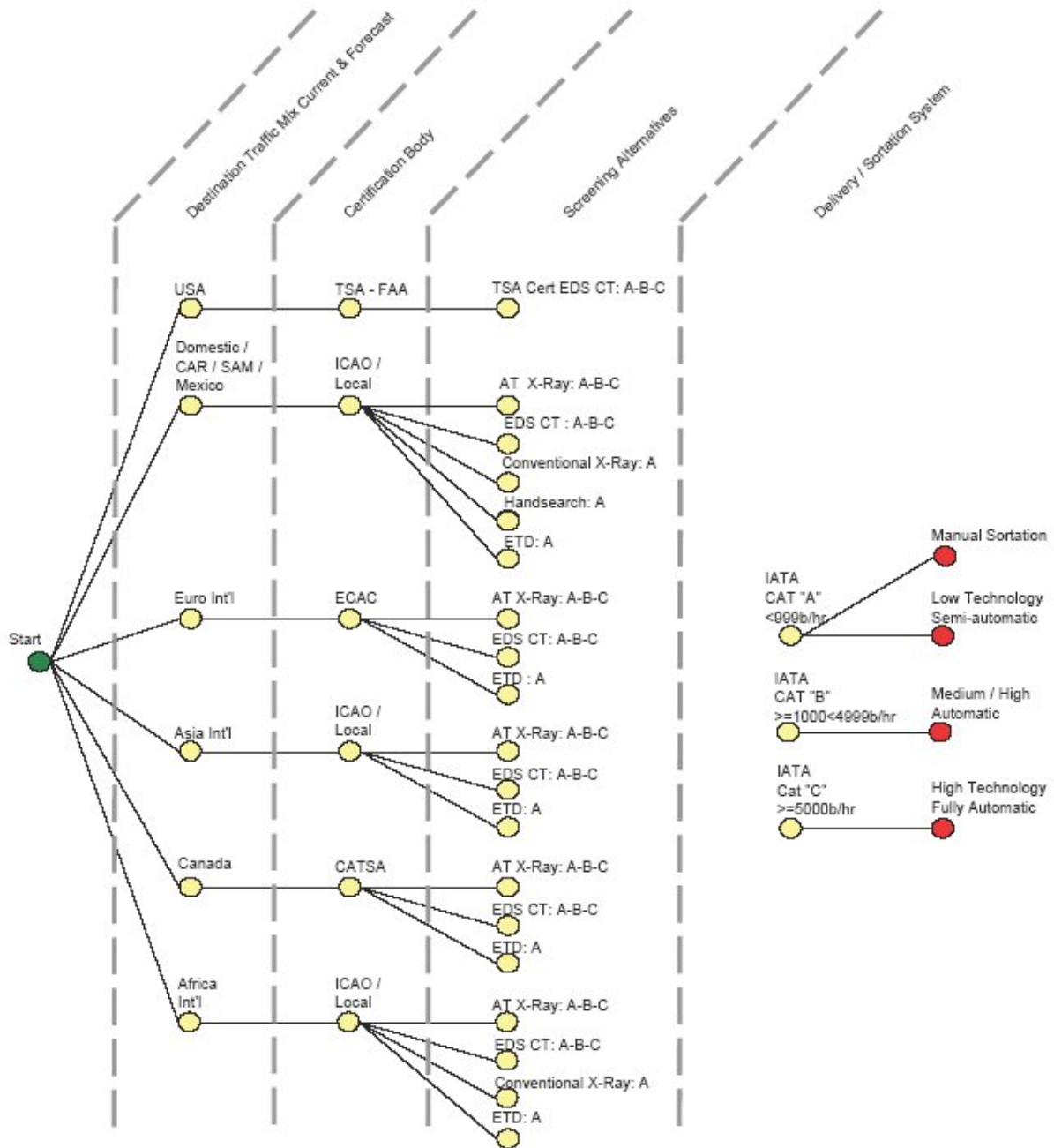
Step 2 – Certification Body. From Step 1 the tree shows which certification body / regulator applies for each region as it is their security requirements which will need to be met. For example: If all flights from the airport are destined for the US, then the regulator there (the Transportation Security Administration – TSA) dictate that the baggage aboard inbound flights to the US must have been screened in accordance with TSA standards which will be shown in the next step.

Step 3 – Screening Alternatives. Depending on the regulator / certification body's requirements, the tree branches to show what screening technologies can be utilised and an indication of what category of size / demand each can accommodate. Using the previous example; the TSA only approve the use of Certified Explosive Detection Systems (EDS) using Computed Tomography (CT) scanning techniques. Thus this technology is the only one that can be used for screening bags inbound to the US and must be used for all categories of demand from IATA Cat A to Cat C. If, however one of the alternative destinations apply, for example: Domestic/CAR/SAM/Mexico, then the regulators (local and ICAO) would accept the use of either Advanced Technology x-ray, EDS CT, Conventional x-ray, handsearch or Explosive Trace Detection (ETD). Each of these technologies has differing throughput capacities and therefore depending on demand, some cannot be usefully applied. Eg: ETD, Handsearch and conventional x-ray are only suitable for small, low demand airports in Cat A, whereas AT x-ray has the capacity to be used in Cat A, B & C.

Delivery / Sortation System. This part of the tree simply defines the IATA Categories of airport / Baggage system size and what broad baggage handling / sortation systems apply:

- Cat A BHS systems less than 999 bags per hour. Can use manual sortation or low technology semi-automatic
- Cat B BHS demand of between 1000 and 4999 bags per hour. Requires medium to high technology and automatic sortation
- Cat C BHS demand over 5000 bags per hour. Will require a highly complex , fully automated sortation system

Hold Baggage Screening Solutions - Decision Tree



6.5 - LA PROBLEMÁTICA DE COMPRA O ARRIENDO

6.5.1 El cumplimiento de la norma 4.4.8 del anexo 17 por parte de los Estados y que entra en vigencia el 01 enero del 2006, pone a estos ante un nuevo escenario con mas interrogantes y dudas que soluciones, por ejemplo: que equipo va utilizar, quien lo va operar (Estado, concesionario o el explotador aéreo) y lo más importante como el financiamiento de los sistemas a utilizarse.

6.5.2 Análisis

6.5.2.1 La norma establece que es responsabilidad de cada Estado y esto significa que lo primero que hay que hacer es un análisis de las realidades operacionales de cada aeropuerto (itinerarios, cantidad de pasajeros por hora en horas pico, tipos de aeronaves etc.). Posteriormente se podría establecer que tipo de sistema de inspección vamos a instalar (AT, EDS, ETD) y finalmente como lo vamos a financiar, el Estado, concesionario, explotador aéreo o los pasajeros.

6.5.3 Adquisición vs. arriendo

6.5.3.1 Si la autoridad aeronáutica es la que tiene que instalar el equipo, se debe considerar los siguientes factores:

- La ubicación geográfica en la región.
- Empresa conocida en el mercado con representación en el país.
- Referencias en otros aeropuertos.
- La modalidad de implementación.
- Los niveles de mantenimiento.
- El entrenamiento requerido.

6.5.3.2 Si la implementación considera, la adquisición por parte del Estado o los operadores, esta modalidad presenta mas desventajas que ventajas, en este aspecto hay que destacar el alto costo, la desactualización de los software, tiene que considerarse alternativas por las fallas, necesariamente debe considerar todos los niveles de mantenimiento y finalmente el reemplazo del equipo.

6.5.3.3 Una de las alternativas más viables siempre y cuando se cuente con mecanismo de financiamiento seguro, es el arriendo del equipo y esta presenta como única desventaja el no haber elegido una empresa responsable, en cuanto las ventajas estas serian mas, como por ejemplo la inversión no seria nuestra, se puede actualizar el software como el equipo acorde a la nueva tecnología, se puede exigir que el respaldo sea de iguales características y finalmente remplazar el equipo que haya aparecido en el mercado con una mejor tecnología, esta modalidad si requiere considerar la inspección, supervisión y evaluación constante por parte del Estado para verificar que se cumplan las especificaciones técnica del contrato.

6.5.4. Mantenimiento y repuestos

6.5.4.1 Se debe tener presente que en este tipo de equipos necesariamente requiere tener un mantenimiento permanente en virtud a que son vitales y no pueden fallar, por lo tanto debe estar asociado a la compra de servicios a la misma empresa ya que nos aseguraría un mejor tiempo de repuesta, por parte de la autoridad aeronáutica requiere tener claro cual es el nivel de falla mas común que tipo de piezas o dispositivo que más falla, de tal manera se evalúa las debilidades y las fortalezas del sistema.

6.5.4.2 En lo referido a los repuestos si se tiene el análisis de cual es el repuesto que mas falla es ese el que hay que tener en stock, si el equipo es único en la región el tiempo de respuesta es más largo, afectando la operatividad del sistema. De la misma manera si se dispone de los mismos equipos en la región es más factible que la empresa cuente con un stock de repuestos, beneficiando en forma significativa la continuidad del servicio.

6.5.5 Conclusión

6.5.5.1 Para cumplir esta norma se debe buscar la compatibilidad de los conceptos de la eficiencia y eficacia, por tal motivo debemos analizar y estudiar todas las alternativas, buscando las soluciones que sean mas acorde a nuestras realidades y lo mas importante tratar de cumplir las normas porque esta forma estaremos cumpliendo con lo establecido con la seguridad de la aviación civil.

7 - ESTABLECIMIENTO DE UN MODELO DE LOS PROCEDIMIENTOS ESTÁNDARES DE OPERACIÓN PARA LA INSPECCIÓN DE EQUIPAJE DE BODEGA

7.1 Contar con procedimientos genéricos mínimos para la inspección del equipaje de bodega, asegura la eficacia, la eficiencia de la medida de seguridad, y la coordinación de esfuerzos entre los Estados para obtener niveles de seguridad similares en ella, lo cual a su vez conlleva a la facilitación del tránsito de los usuarios por los aeropuertos y su abordaje en las aeronaves, estandariza en lo posible los tiempos de las transferencias, unifica los criterios de tratamiento de los artículos prohibidos y peligrosos, y los aplicados a los pasajeros que los transportan en su equipaje de bodega.

7.2 Concordar el contenido mínimo de los procedimientos de inspección proporciona una base firme para crear cooperación, entendimiento y equivalencias entre la seguridad de la aviación civil de diversos Estados.

7.3 Propuesta de contenido mínimo de los Procedimientos de Operación para la Inspección.

7.3.1 Objetivos y alcances de los procedimientos.

7.3.2 Definiciones y abreviaturas.

7.3.3 Disponibilidad y actualización del documento.

7.3.4 Métodos de inspección.

7.3.5 Estructura organizacional para la inspección.

7.3.6 Responsabilidades en la inspección (inspectores, inspectores en jefe, supervisores, medios de comunicación y coordinación, controles de contaminación de equipos ETD, filmación y/o fotografía de la inspección, operación, calibración, prueba y mantenimiento de los equipos, bitácoras de los equipos y de eventos en la inspección; equipo y herramientas para seguridad industrial; requisitos para la seguridad operacional).

7.3.7 De la apertura de las facilidades para la inspección y cierre (antes y después de una jornada de trabajo, después de un mantenimiento, después de una contingencia o emergencia, etc.).

7.3.8 Procedimientos de inspección (incluyéndolos en el documento por cada tipo de equipo, definición de situaciones específicas durante la inspección como su rechazo, y procedimientos especiales

tales como los dedicados a valijas diplomáticas, animales vivos, objetos religiosos, evidencia judicial, órganos humanos para donación, etc.).

- 7.3.9 Procedimientos de inspección física de equipajes y artículos específicos.
- 7.3.10 Procedimientos de inspección alternos con definición de circunstancias de aplicación.
- 7.3.11 Materiales peligrosos, sus procedimientos de inspección y excepciones.
- 7.3.12 Control de calidad de la inspección de equipaje de bodega: Evaluaciones, Auditorias y Pruebas (dirigidas al recurso humano y al recurso material).
- 7.3.13 Procedimientos para resolución de alarmas y coordinación en su caso con las autoridades policiales y de manejo de explosivos.
- 7.3.14 Coordinación con otras medidas de seguridad al equipaje de bodega, antes y después del proceso de inspección.

7.4 IMPLEMENTATION OF GLOBALLY ACCEPTED STANDARD OPERATING PROCEDURES FOR THE SUCCESSFUL IMPLEMENTATION OF 100 PER CENT HOLD BAGGAGE SCREENING

7.4.1 Introduction

7.4.1 The air transport industry operates in an extremely complex environment. In order to properly service their customers, air carriers must operate a multiplicity of routes, through numerous transfer and transit points involving numerous States, airports and often air carriers.

7.4.1.2 Superimposed on this already complex network are decisions made by individual States regarding the security and facilitation standards that they require within their territories as well as security and facilitation measures to be adopted by their registered air carriers when they operate in another State. This regulatory/operational environment has been made even more complex and difficult since the tragic events of 11 September, 2001.

7.4.1.3 This makes it essential for industry to participate with the regulatory and border control agencies and other security related organizations in their States at an early stage in the planning process so as to ensure that hold baggage screening (HBS) is introduced in the most cost-effective way and to avoid unnecessary costs which may otherwise be imposed upon them.

7.5 STATES WITH 100% HBS ALREADY IMPLEMENTED

7.5.1 ICAO Annex 17 - Security Standard 4.4.8 states: "From 1 January 2006, each Contracting State shall establish measures to ensure that originating hold baggage intended to be carried in an aircraft engaged in international civil aviation operations is screened prior to being loaded into the aircraft." This is currently a Recommended Practice in Annex 17. IATA full supports implementation of 100% HBS as a critical element of the aviation security system.

7.5.2 Numerous States have already implemented 100% HBS, however the efficiency and effectiveness of these systems varies substantially from State to State and often from airport to airport within a State.

7.5.3 The efficiency and effectiveness of the HBS system in a particular airport can have a major impact on facilitation of passengers. As an example, the speed with which hold baggage is processed has a direct impact on originating passenger processing time as well as the Minimum Connect Time (MCT) for those passengers transiting or transferring through a particular airport.

7.5.4 The impact of HBS systems on passenger processing not only directly impacts on the efficiency with which passengers can be handled and therefore the customer service that they receive, but also on the operational efficiency of the air carriers. Longer processing times place restrictions on the number of flights that an air carrier can operate out of a certain airport in a given period of time, which in turn has a direct financial impact on that air carrier.

7.5.5 Additionally the efficiency of an HBS system often has a direct impact on the screening effectiveness of the system. The industry has learned through years of experience that there is often a direct correlation between the efficiency of a particular HBS system and its effectiveness in screening out potential threat items.

7.5.6 The implementation of an efficient and effective 100% HBS system will also facilitate the implementation of the so-called "one-stop security" concept not only on a regional basis but globally. Key to implementation of such a concept, from industries point of view, is the exemption from the need to screen transfer and transit bags. This not only provides tremendous benefits to industry in the form of shorter MCTs but also to States and their designated screening authorities who are able to free up resources for other tasks.

7.5.7 The screening authority (be it airport operator or other specified screening authority) should be responsible for all elements of the HBS system. This would include the baggage reconciliation system (BRS), as appropriate, which preferably should be automated and run concurrent with the technical screening systems.

7.6 STATES IN THE PROCESS OF IMPLEMENTING 100% HBS

7.6.1 The deadline for ICAO Annex 17 Security Standard 4.4.8 to come into effect is fast approaching and some States have yet to completely implement 100% HBS. However, in many cases States have reported that they have implementation plans that will be completed by 1 January 2006.

7.6.2 IATA encourages States to implement an HBS system that is suitable to the configuration of the airport as well as to the operational requirements (baggage throughput, etc.). States should also consider projected increased capacity when determining the most suitable HBS option. Implementing 100% HBS, may result in temporary disturbances of normal airport operations, frequent refurbishment should, as far as practicable, be avoided.

7.6.3 IATA hopes that States and Airport authority will consider implementing permanent solutions immediately rather than utilize temporary measures to meet the ICAO proposed deadline date of 1 January 2006 and then develop permanent solutions later on. Whilst installation of temporary 100% HBS would probably only cause slight disturbance to airport operations, it would nonetheless cause a duplication of operational disturbance and resources allocated to this project. Also, temporary HBS system may not be as effective as permanent solutions as they may not be perfectly suited to their environment.

7.6.4 IATA encourages States to meet the ICAO deadline of 1 January 2006 as some States have indicated that they would not allow air carrier to service Stations within their State if they are departing from States where there is no 100% HBS system in place.

7.6.5 IATA wishes to reiterate that implementation of 100% HBS should be a State responsibility and whilst air carrier could potentially be most directly affected by non-compliance to this Standard, all stakeholders would ultimately be penalized.

7.7 HBS STANDARD OPERATING PROCEDURES

7.7.1 The most important factor when determining what procedures should be developed to facilitate the Hold Baggage Screening process is that they assist all involved in meeting the screening standards determined by the State

7.7.2 Standard Operating Procedures, whilst always designed to meet globally harmonized and accepted screening standards, should be developed according to the operational environment of the particular airport.

7.7.3 As such, whilst the Appropriate Authority for Aviation Security should have oversight and quality assurance roles in the establishment of screening procedures, the procedures themselves should be developed by the entity responsible for performing the screening (often known as Screening Authority) at the particular airport, in co-operation with all other stakeholders affected by the introduction of Hold Baggage Screening which includes but is not limited to air carriers, airport authority and the Appropriate Authority for Aviation Security.

7.7.4 All Standard Operating Procedures should have a common goal of providing screening personnel tools and methods to ensure that no un-cleared baggage are loaded on an aircraft, and provide the screening personnel with the procedures to inspect and clear all types of hold baggage in an efficient and effective manner.

7.7.5 Standard Operating Procedures also need to be developed for all stakeholders with an indirect role in the Hold Baggage Screening Process, to ensure that their daily activities and duties do not interfere negatively with the screening of hold baggage.

7.7.6 Screening Procedures should be developed in a manner that does not negatively impede on the safety, inherent speed of civil aviation and the service level provided to air carriers and other airport tenants.

APPENDIX D

ESSENTIAL COMPONENTS THAT SHOULD BE CONSIDERED AS GENERAL GUIDANCE FOR THE DEVELOPMENT OF A MODEL CARGO SECURITY PROGRAMME

- ✎ TITLE
- ✎ PURPOSE
- ✎ DEFINITIONS AND ACRONYMS
- ✎ GENERALITIES
- ✎ NORMATIVE BACKGROUND
- ✎ COMPETENT AUTHORITY
- ✎ INVOLVED ACTORS
- ✎ FUNCTIONS AND RESPONSIBILITIES
- ✎ PLANS CONTENTS (ACCREDITED AGENTS AND CARRIERS)
 - SECURITY PLAN
 - CONTINGENCY PLAN
 - EMERGENCY PLAN
- ✎ EVALUATION PROCEDURE AND PROGRAMME'S APPROVAL
- ✎ THREATS EVALUATION TO THE TRANSPORT OF AIR CARGO
- ✎ SECURITY MEASURES AND CONTROL (EXCEPTIONS)
 - PREPARATION
 - TRANSPORT
 - ACCEPTANCE PROCEDURE (NECESSARY DOCUMENTATION)
- ✎ CARGO CLASSIFICATION
 - RECOGNIZED DISPATCH.
 - ACCREDITED CARGO AGENT.
 - NON-RECOGNIZED DISPATCH CARGO.
 - SPECIAL CARGO CATEGORIES.
- ✎ STORAGE
- ✎ CARGO HANDLING
- ✎ INSPECTIONS PROCEDURES
- ✎ BOARDING
- ✎ MAIL AND COURIER
- ✎ ACCREDITED AGENT
 - ACCREDITED PROCEDURE
 - REGISTER OF ACCREDITED AGENT
- ✎ TRAINING
- ✎ PROSECUTION
- ✎ PENALTY SYSTEM

- END -