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INTERNATIONAL CIVIL AVIATION ORGANIZATION

Collaborative Momentum

The 2010 ICAO Assembly and Sixth MRTD Symposium establish unprecedented global consensus on aviation security, propelling a new era of State-tailored identity management and border control advances

In this issue:

2010 Assembly Resolution and Security Declaration
Sixth MRTD Symposium Review - High-Level Addresses and Summaries
OSCE Interview: Raphael Peri • China becomes newest ICAO PKD Member
MRTD and e-Passport Capacity-Building: Montevideo and Maputo





**ICAO MRTD REPORT
VOLUME 6, NUMBER 1, 2011**

Editorial

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The *MRTD Report* encourages submissions from interested individuals, organizations and States wishing to share updates, perspectives or analysis related to global civil aviation. For further information on submission deadlines and planned issue topics for future editions of the *MRTD Report*, please contact Mauricio Siciliano, managing editor at: msiciliano@icao.int

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The publishers extend their thanks to the companies, organizations and photographers who graciously supplied photographs for this issue.

Published by

International Civil Aviation Organization (ICAO)
999 University Street
Montréal, Québec
Canada H3C 5H7

The objective of the *ICAO MRTD Report* is to provide a comprehensive account of new developments, trends, innovations and applications in the field of MRTDs to the Contracting States of ICAO and the international aeronautical and security communities.

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Printed by ICAO

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Technical Advisory Group on Machine Readable Travel Documents (TAG/MRTD)

Member	Nominated by	Member	Nominated by
Mr. R. M. Greenwood	Australia	Mr. J. Verschuren	Netherlands
Mr. G. K. McDonald	Canada	Ms. A. Offenberger	New Zealand
Ms. M. Cabello	Chile	Ms. I.O. Sosina	Nigeria
Mr. M. Vacek	Czech Republic	Mr. C. Ferreira Gonçalves	Portugal
Ms. M. Pujau-Bosq	France	Mr. O. Demidov	Russian Federation
Dr. E. Brauer	Germany	Mr. S. Tilling	Sweden
Mr. A. Manickam	India	Mr. R. Vanek	Switzerland
Mr. J. Nugent	Ireland	Mrs. K. Mitchinson	United Kingdom
Mr. N. Kawamura	Japan	Mr. M. Holly	United States

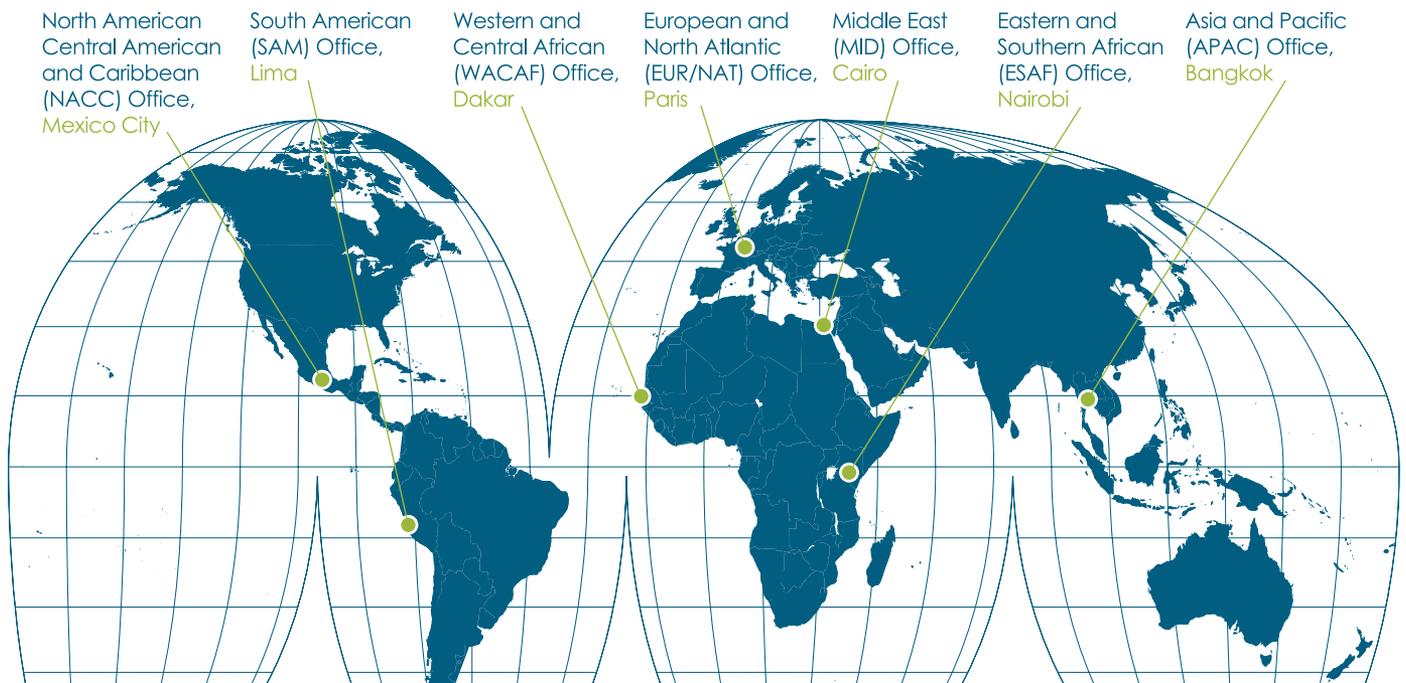
The TAG/MRTD is appointed by the Secretariat, which reports on its progress to the Air Transport Committee.

The TAG/MRTD develops specifications for machine readable passports, visas and official travel documents, electronic machine readable travel documents and guidance material to assist States in implementing these specifications and exploiting modern techniques in inspection systems

Observer organizations

- Airports Council International (ACI)
- European Commission (EC)
- International Air Transport Association (IATA)
- International Criminal Police Organization (INTERPOL)
- International Labour Organization (ILO)
- International Organization for Standardization (ISO)
- Organization for Security and Cooperation in Europe (OSCE)
- International Organization for Migration (IOM)
- United Nations (UN)
- Organization of American States (OAS) - Inter-American Committee on Terrorism (CICTE)

ICAO's Global Presence





2010: A Year of Noteworthy Accomplishments

As of the deadline set by ICAO in Annex 9, more than 180 States had issued Machine Readable Passports (MRPs) in conformity with ICAO specifications as of 1 April 2010. According to the Implementation and Capacity-Building Working Group (ICBWG) of the Technical Advisory Group on Machine Readable Travel Documents (TAG/MRTD), some five States had not introduced MRPs by the end of 2010. The MRTD programme has been working closely with the ICBWG in identifying related assistance needs and outlining capacity-building support activities in this regard.

New Technology Working Group

The New Technology Working Group (NTWG) of the (TAG/MRTD) continued assisting the Secretariat in developing and maintaining the relevance of the specifications contained in Machine Readable Travel Documents (Doc 9303), developing new MRTD specifications and issuing related guidance material. Regular updates were provided through Supplements (Release 8, formally approved in June 2010), which is to serve as basis for the update of all parts of Document 9303.

Following the Resolution adopted at the ICAO 37th Assembly, the NTWG work has expanded significantly to include developing specifications and guidelines for the evidence of identity. Another key area of work, as reconfirmed by the Assembly Resolution, is updating the specifications of e-MRPs and other MRTDs to keep them up to date in the light of technological advances.

Enhanced Cooperation and Capacity-Building

The Secretariat, together with the Implementation and Capacity-Building Working Group (ICBWG) of the TAG/MRTD, provided assistance to numerous States and international organizations on matters related to MRTDs. The main focus of capacity-building efforts continued to be assistance projects for States unable to meet the 1 April 2010 deadline for the introduction of ICAO-compliant MRPs. Additional focus was on security vulnerabilities related to the evidence of identity (birth certificates, national ID cards, etc.) required to apply for travel documents, and the

introduction of automated migrant processing systems equipped with passport readers.

Ongoing close cooperation and consultations were maintained with other UN and non-UN bodies, including the UN Counter-Terrorism Committee Executive Directorate (UN CTED), the United Nations Counter-Terrorism Implementation Task Force (CTITF), INTERPOL, the International Organization for Standardization (ISO), Airports Council International (ACI), the International Air Transport Association (IATA), the Organization of American States' Secretariat of the Inter-American Committee Against Terrorism (OAS CICTE), the Organization for Security and Co-operation in Europe (OSCE) and the International Organization for Migration (IOM).

Numerous States were assisted in 2010, ranging from clarifying MRTD specifications and interpreting their requirements, to full-scale assessments, consultations or training sessions. Capacity-Building activities included:

- Technical consultations and workshop on e-Passport issuance in Uzbekistan (jointly with the OSCE).
- Workshop on travel document security for the South of Latin America in Uruguay (jointly with OAS CICTE — *please also see the Regional Progress article in this issue on page 20*).
- Technical consultations with Interpol on enhancing joint travel document security activities.
- Workshop on 'Promoting the ICAO Public Key Directory' (PKD) in Vienna for 53 OSCE States (jointly with OSCE and ICAO PKD Board — *for more on ongoing ICAO/OSCE cooperation please see the Raphael Perl interview on page 26*).
- ICAO Regional Seminar on MRTDs and Biometrics in South America (Montevideo, Uruguay, July 2010).
- OSCE/ICAO/IOM Assessment Mission for e-Passport Issuance, Integrity and Identity Management (Tajikistan, July 2010).
- Regional Seminar on Machine Readable Travel Documents (MRTDs), Biometrics and Security Standards for Africa and the Middle East (Maputo, Mozambique, November 2010).

The MRTD programme has been expanding its capacity-building work through the Implementation and Capacity-Building Working Group (ICBWG), which held 2010 meetings in Warsaw and Dublin. Ongoing work includes intensifying donor liaison, project development and seeking external funding for MRTD capacity-building projects.

Additionally the ICBWG has been developing an MRTD ICAO-compliance certification mechanism, developing PR and information dissemination materials on MRTD specifications and available technical assistance, and developing specific assistance activities to States.

Training

The MRTD programme has also developed a strategy to launch an MRTD training initiative, and specific training modules are now being developed within the framework of the ICBWG and in close cooperation with Frontex — the European Union's border control agency. The ICAO *Guide for Assessing Security of Handling and Issuance of Travel Documents* has been completed in English and French and posted on the MRTD Web site. It can be used as a resource for ICAO assessments and workshops.

Sixth MRTD Symposium

The MRTD Symposium was held in Montreal from 1 to 4 November 2010 and was attended by 574 participants from 73 Contracting States and 10 international organizations. The meeting benefited from presentations by the Secretary General of Interpol, the Chairman of the Counter-Terrorism Implementation Task Force of the United Nations, the Director of Strategic Planning Directorate of INTERPOL, and other senior representatives from States and various international and regional organizations. It also served as a platform to confirm ICAO's leadership in the development of the MRTD Programme as an essential tool in combating terrorism and trans-border crime, and to update the international community on new developments to be implemented by ICAO as instructed by the 37th Assembly.

To improve access to information, the MRTD web site was comprehensively updated, providing Member States and users, including TAG/MRTD working groups, with extended reference



material and powerful new networking tools. The Secretariat also developed an on-line directory of service and product vendors (<http://mrtd.icao.int>). The MRTD Community web site provides easy reference to States about private sector vendors producing passports, other travel documents and related security materials and equipment.

MRTD Report

The *MRTD Report* magazine continues to be published three times per year and, along with the MRTD symposia and regional seminars, serves to effectively promote and educate Contracting States on MRTD developments and biometric specifications.

Public Key Directory (PKD)

Since its establishment in March 2007, the number of participants in ICAO's Public Key Directory (PKD) has increased to 26 Member States, with more expected to join. The PKD Board reached its maximum number of fifteen Members — Australia, Canada, China, France, Germany, India, Japan, Czech Republic, Korea (Republic of), New Zealand, Nigeria, Singapore, Switzerland, United Kingdom and United States.

ICAO Declaration on Aviation Security

The ICAO Declaration on Aviation Security, which was unanimously approved at the ICAO 37th Assembly, provided guidance for the future of the MRTD programme. In addition to traditional aviation security measures such as use of new technologies in passenger and cargo screening, the Declaration also stressed

the importance of travel document security, identity management and data sharing as part of an enhanced comprehensive aviation security regime for the 21st century.

In particular, the Declaration called for intensified and expanded use of the ICAO Public Key Directory and INTERPOL's Stolen and Lost Travel Document Database, two key instruments in preventing and combating identity fraud. Also, it placed particular emphasis on information collection, analysis and timely sharing, and urges States to share best practices in consolidating travel document security and fraud detection. All these issues are directly related to MRTDs and identity management.

Other Priorities

The MRTD programme will continue with the implementation of Doc 9303 specifications and best practices worldwide as a key instrument to enhance aviation security, as well as counter terrorism and trans-border crime. In particular, it will continue its work on updating and enhancing Doc 9303 specifications or related technical reports, as required, in response to the emerging needs of States. The Programme will also be working on new challenges and technological developments, including the development of best practices for evidence of identity. Lastly it will continue to respond to requests for information and guidance from States and industry on various MRTD-related matters, providing pertinent expertise and advice on MRTD-related matters to the Council and its committees, as well as any other external entities. ■

Establishing Clear International Consensus

The following is the final text of Appendix D — Facilitation, Section II, to the Resolutions adopted by the Delegates to the 37th ICAO General Assembly held in the fall of 2010.

ICAO Member States established a clear and strong consensus on this occasion regarding the need for all States to advance their national travel documents to conform to the newest ICAO International Standards in this area.

The Assembly also confirmed the important need for all ICAO Members to begin cooperating more effectively with other States and international law enforcement agencies, and to work toward enhancing the security and integrity of their breeder document and the related identity management systems which so fundamentally support today's international identity, border control and mobility regimes.

Section II. International cooperation in protecting the security and integrity of passports

Whereas the passport is the basic official document that denotes a person's identity and citizenship and is intended to inform the State of transit or destination that the bearer can return to the State which issued the passport;

Whereas international confidence in the integrity of the passport is essential to the functioning of the international travel system;

Whereas the veracity and validity of machine readable travel documents (MRTDs) depends on the documentation used to establish identity, confirm citizenship or

nationality and assess entitlement of the passport applicant (i.e. 'breeder' documentation);

Whereas Member States of the United Nations have resolved, under the Global Counter-Terrorism Strategy adopted on 8 September 2006, to step up efforts and cooperation at every level, as appropriate, to improve the security of manufacturing and issuing identity and travel documents and to prevent and detect their alteration or fraudulent use;

Whereas Resolution 1373 adopted by the United Nations Security Council on 28 September 2001, decided that all States shall prevent the movement of terrorists or terrorist groups by effective border controls and controls on issuance of identity papers and travel documents, and

through measures for preventing counterfeiting, forgery or fraudulent use of identity papers and travel documents;

Whereas high-level cooperation among States is required in order to strengthen resistance to passport fraud, including the forgery or counterfeiting of passports, the use of forged or counterfeit passports, the use of valid passports by impostors, the use of expired or revoked passports, and the use of fraudulently obtained passports;

Whereas the use of stolen blank passports, by those attempting to enter a country under a false identity, is increasing worldwide; and

Whereas ICAO provides assistance to States in all matters related to MRTDs including project planning, implementation, education, training and system evaluation services, and has set up the Public Key

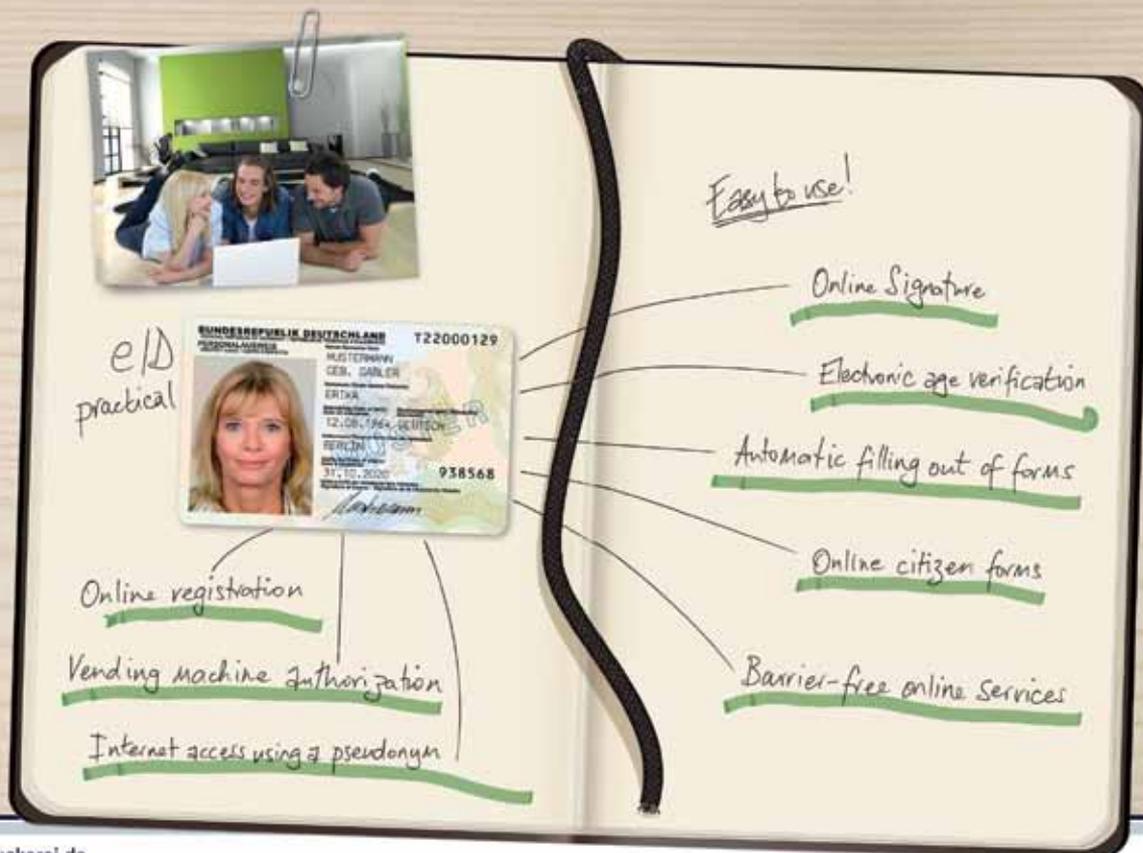
Directory (PKD) to strengthen the security of biometrically-enhanced MRPs (ePassports):

The Assembly:

1. Urges Contracting States to intensify their efforts to safeguard the security and integrity of the breeder documentation;
2. Urges Contracting States to intensify their efforts to safeguard the security and integrity of their passports, to protect their passports against passport fraud, and to assist one another in these matters;
3. Urges those Contracting States that have not already done so, to issue machine readable passports in accordance with the specifications of Doc 9303, Part 1;
4. Urges Contracting States to ensure that the expiration date of non-machine readable passports falls before 24 November 2015;
5. Urges those Contracting States requiring assistance in implementing

MRTD standards and specifications to contact ICAO without delay;

6. Requests the Council to take appropriate measures to establish guidance on breeder documentation;
7. Requests the Council to continue the work on enhancing the effectiveness of controls on passport fraud by implementing the related SARPs of Annex 9 and developing guidance material to assist Contracting States in maintaining the integrity and security of their passports and other travel documents;
8. Urges those States issuing e-Passports to join the ICAO PKD; and all receiving States to verify the digital signatures associated with the passports; and
9. Urges those Contracting States that are not already doing so, to provide routine and timely submissions of lost and stolen passport data to Interpol's Automated Search Facility/Stolen and Lost Travel Document Database. ■



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Clear Resolve and Strong Commitment

Under ICAO's leadership, aviation security around the world has improved markedly in recent years. Despite this progress, civil aviation is likely to remain a target of terrorism, considering its nature as an essential mode of transport that contributes significantly to worldwide economic and social development.

As a testament to their commitment to prioritize security-related issues moving forward, ICAO Member States unanimously adopted the following Declaration on Aviation Security at the 37th Session of the ICAO Assembly in recognition of the continuing threats to civil aviation. It represents a clear and high-level commitment by States to strengthen aviation security worldwide through enhanced international cooperation.

It's noteworthy that the Declaration was the product of a comprehensive consensus-building exercise, reflecting the outcome of a series of Ministerial-level regional conferences on aviation security, held with ICAO's participation, during the first half of 2010.

While convened in several locations—specifically Mexico City, Tokyo, Abuja and Abu Dhabi—participants in these conferences expressed common concerns. In brief, they underscored the need to enhance information collection and sharing, including the sharing of sensitive threat information, among Member States and between concerned entities within States. They also stressed the need for effective security technology and strong international Standards, as well as the importance of Capacity-Building assistance for States that experience difficulty in addressing security shortcomings. The Declaration is more than a statement of political will in the sense that it enumerates the key activities considered necessary to address the evolving threat in a proactive way.

Security threats, and in particular acts of terrorism, transcend national boundaries. An effective global response requires commitment as well as action. The Declaration on Aviation Security serves this purpose by emphasizing the collective responsibility for taking appropriate action to address a worldwide problem.

37th Assembly: Declaration on Aviation Security

The Assembly, recognizing the need to strengthen aviation security worldwide, in light of the continuing threat to civil aviation, including the attempted sabotage of Northwest Airlines flight 253 on 25 December 2009; and acknowledging the value of the joint declarations on civil aviation security emanating from regional conferences held with a view to enhancing international cooperation, hereby urges Member States to take the following actions to enhance international cooperation to counter threats to civil aviation:

1. Strengthen and promote the effective application of ICAO Standards and Recommended Practices, with particular focus on Annex 17 — Security, and develop strategies to address current and emerging threats.
2. Strengthen security screening procedures, enhance human factors and utilize modern technologies to detect prohibited articles and support research and development of technology for the detection of explosives, weapons and prohibited articles in order to prevent acts of unlawful interference.
3. Develop enhanced security measures to protect airport facilities and improve in-flight security, with appropriate enhancements in technology and training.
4. Develop and implement strengthened and harmonized measures and best practices for air cargo security, taking into account the need to protect the entire air cargo supply chain.
5. Promote enhanced travel document security and the validation thereof using the ICAO Public Key Directory (PKD) in conjunction with biometric information, and the commitment to report on a regular basis, lost and stolen passports to the INTERPOL Lost and Stolen Travel Documents Database to prevent the use of such travel documents for acts of unlawful interference against civil aviation.
6. Improve Member States' ability to correct deficiencies identified under the Universal Security Audit Programme (USAP) by ensuring the appropriate availability of audit results among Member States, which would enable better targeting of Capacity-Building and technical assistance efforts.
7. Provide technical assistance to States in need, including funding, Capacity-Building and technology transfer to effectively address security threats to civil aviation, in cooperation with other States, international organizations and industry partners.
8. Promote the increased use of cooperation mechanisms among Member States and with the civil aviation industry, for information exchange on security measures in order to avoid redundancy, where appropriate, and for early detection and dissemination of information on security threats to civil aviation, including through the collection and transmission of advance passenger information (API) and passenger name record (PNR) data, as an aid to security, whilst ensuring the protection of passengers' privacy and civil liberties.
9. Share best practices and information in a range of key areas, such as: screening and inspection techniques, including assessments of advanced screening technology for the detection of weapons and explosives; document security and fraud detection; behaviour detection and threat-based risk analysis; screening of airport employees; the privacy and dignity of persons; and aircraft security.



“I commend the International Civil Aviation Organization for adopting yesterday’s Declaration on Aviation Security, which forges a historic new foundation for aviation security that will better protect our world from evolving terrorist threats. Following the attempted December 25th terrorist attack, at my direction, the Department of Homeland Security has worked with ICAO, our international partners, and representatives ranging from airline CEOs to aviation industry trade associations in an unprecedented effort to strengthen international aviation security. The extraordinary global collaboration demonstrated by the nearly 190 ICAO countries during the ICAO General Assembly in Montreal has helped to bring about a truly 21st century international aviation security framework that will make air travel safer and more secure than ever before.”

– President Barack Obama

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Travel Documents and Identity Management: Toward a More Effective Security Regime



The Sixth Symposium on ICAO Machine Readable Travel Documents (MRTDs), Biometrics and Security Standards, was held in Montreal from 1 to 4 November 2010. It benefitted from the tremendous momentum on security-related matters generated by the 37th Assembly's unanimous adoption of a new Declaration on Aviation Security. The highly-successful Sixth MRTD Symposium was attended by 579 participants from 91 Contracting States and seven international organizations.

The meeting benefitted from presentations by the Deputy Director of US-Visit Program, the Chairman of the United Nations Counter Terrorism Implementation Task Force, the Director of the Strategic Planning Directorate of INTERPOL and other senior representatives from States and various international and regional organizations. It also served as a platform to confirm ICAO's leadership in the development of the MRTD Programme as an essential tool in combating terrorism and transborder crime, and to update the international community on new developments to be implemented by ICAO as instructed by the 37th Session of the ICAO Assembly.

In these opening remarks to the Symposium's participants, ICAO Secretary General Raymond Benjamin strongly reaffirmed the importance of, and his personal commitment to, the MRTD Programme, stressing his appreciation to the TAG/MRTD Working Group for its tremendous efforts in the successful progressing of developments in this area and highlighting the need for increased MRTD capacity-building efforts and stakeholder cooperation.

This year's Sixth MRTD Symposium takes on particular significance given the very positive results of the 37th ICAO Assembly, held in this very room just over three weeks ago.

A record number of Assembly participants, from 175 Member States, unanimously adopted a special Declaration on Aviation Security which urges them to reaffirm their commitment to security and to engage in greater international cooperation when addressing complex and evolving threats to aircraft and air transport systems.

What I find particularly relevant to this MRTD Symposium is the emphasis placed by the Assembly Aviation Security Declaration on travel document security, identity management and data sharing as vital components of an effective and over-arching security strategy.

For example, the Declaration calls for intensified and expanded use of the ICAO Public Key Directory and

INTERPOL's Stolen and Lost Travel Document Database in combating identity fraud. It also calls for more intelligent aviation security processes—in terms of information collection, analysis and timely data sharing among and between agencies and States. States are encouraged to share expertise and apply best practices to consolidate travel document security and fraud detection.

Overall, I see the Declaration being perfectly in line with two major trends in the ongoing evolution of the ICAO MRTD programme.

The first is a widening scope for the programme. The latest meeting of the Technical Advisory Group on MRTD's, or TAG/MRTD, and the recent Assembly both recognized that the original objectives of the programme have largely been achieved. MRTD norms have been established and there exists a sustainable mechanism for updating specifications to meet evolving needs. The MRTD Programme's focus on preventing transborder crime and terrorism is gradually shifting to document pre- and post-issuance phases.

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“What I find particularly relevant to this MRTD Symposium is the emphasis placed by the Assembly Aviation Security Declaration on travel document security, identity management and data sharing as vital components of an effective and over-arching security strategy.”

This is where serious vulnerabilities remain.

In the pre-issuance stage, civil registry documents used to establish identity, as well as the document issuance process itself, reveal weaknesses that can be exploited for criminal purposes. A fraudulent birth certificate, for example, can easily be used when applying for a passport in another name.

In the post-issuance phase, significant security challenges remain with regard to border controls, travel document fraud, forensic examination and detection, and cross-border intelligence sharing.

Unless all of these concerns are addressed in a proactive manner — an initiative that requires political will, effort and resources—they will seriously undermine the core MRTD Programme.

The second trend is an increasing requirement for MRTD capacity-building efforts worldwide. Current MRTD specifications can be readily implemented by most developed States yet a number of less developed States experience difficulty in achieving compliance. This is due mainly to the lack of technical expertise, funds, or both.

Such capacity shortfalls compromise the universal implementation and effectiveness of MRTDs. The answer is to instil closer dialogue with States that

need assistance, intensify liaison with donor agencies and thereby significantly expand Capacity-Building measures. ICAO is currently exploring ways to better help States in building their MRTD implementation capacity.

In this process, the MRTD Programme receives invaluable support from the TAG/MRTD and its working groups. The New Technologies Working Group continues to develop and maintain MRTD and e-MRTD specifications in light of emerging technologies. The Implementation and Capacity-Building Working Group established two years ago has been gaining momentum, and is expanding its activities in project development and implementation. It

has become an effective international intermediary that increasingly matches the needs of States with available technical expertise and donor funding.

I would like to take this opportunity to thank the TAG/MRTD working group participants for all their efforts. Your ongoing contribution to ICAO's work is essential to the future success of the MRTD Programme.

Before I conclude, I would also like to mention that this year marks the thirtieth anniversary of the distribution of ICAO Machine Readable Travel Documents, also known as Doc 9303. It has become the authoritative publication containing specifications for machine-readable passports, visas and ID cards, including biometric travel documents. No longer limited to rules on how to produce and personalize MRTDs, Doc 9303 now addresses the integrity of the issuance process, identity fraud prevention and the incorporation of robust security features. It will continue to evolve through the years to reflect the dynamic reality in which we must operate.

Again, I sincerely want to thank you for having taken the time to join us here this week, and I wish you all a very engaging and successful Symposium. ■

“There is an increasing requirement for MRTD capacity-building efforts worldwide... The answer is to instil closer dialogue with States that need assistance, intensify liaison with donor agencies and thereby significantly expand capacity-building measures. ICAO is currently exploring ways to better help States in building their MRTD implementation capacity.”

Adoption of New Security Roadmap Signals Key Step in Countering Terrorism

The adoption of a roadmap by 14 ICAO Member States to further protect global air transport from terrorist and other security threats was praised recently by ICAO Secretary General Raymond Benjamin at the conclusion of a two-day regional aviation security conference in New Delhi.

Among the measures included in the roadmap are actions that States will take to strengthen security screening procedures by ensuring that professionals are appropriately trained and equipped. Air cargo security will be enhanced through working with Customs authorities on common goals. Capacity-Building assistance to States in need in cooperation with ICAO, other States and the aviation industry is emphasized in the roadmap.

The conference was the first in a series on implementing the ICAO Declaration on Aviation Security, unanimously adopted by the Organization's Assembly last October to deal with known, new and emerging threats to civil aviation.

"The challenge, OUR challenge, is to turn commitment into action. Terrorism is a global problem that requires global

solutions," Benjamin emphasized when urging participants to develop the roadmap during the opening of the conference.

"This roadmap is a key step in addressing the security challenge and can serve as a model for other regional aviation security conferences, culminating in a global security conference planned for next year at ICAO Headquarters in Montréal," Benjamin indicated.

In support of the roadmap's initiatives, Benjamin pointed to ICAO's ongoing collaboration with the air transport industry on a security checkpoint of the future concept to improve the effectiveness of passenger and carry-on baggage screening at airports. ICAO is also working with the World Customs Organization to establish best practices for air cargo security.

The Government of India, through the Minister of Civil Aviation, is to play a leading role in the implementation of the roadmap in the region through technical cooperation and other initiatives. ■

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ICAO's Leadership Role in Setting Global MRTD SARPs and Specifications



ICAO's work in the area of machine-readable travel documents began as far back as 1968, culminating in the first edition of the world's now guiding work in this domain: ICAO Doc 9303. Since 1984, efforts in this area have further evolved based on the research and guidance of the Organization's TAG/MRTD Working Group and the key individuals who have demonstrated extraordinary commitment through their work for this body over recent decades.

On the occasion of the Sixth MRTD Symposium and the 30th anniversary of the publishing of the first edition of Doc 9303, Folasade Odutola, Director of the ICAO Air Transport Bureau, extends the gratitude of the Organization to the individuals who have helped ICAO realize this tremendous global achievement and looks toward a future where identity management and other advances promise to improve even further the security and convenience of the travelling public.

I am delighted to have this opportunity to address this distinguished audience and provide some reflections on the past and the future of the ICAO MRTD Programme.

As mentioned just a moment ago by the Secretary General, this year marks the thirtieth anniversary of the publication of ICAO Doc 9303, the 'body of knowledge' that outlines specifications for machine-readable passports, visas and ID cards, including biometric travel documents. The first edition, issued in 1980, described the basic principles of a machine-readable passport. Today's Doc 9303 is comprised of three comprehensive parts that elaborate on state-of-the-art technical specifications for machine-readable and biometric travel documents and, as we shall see, will continue to expand and evolve in response to future needs.

It's worthy to note that ICAO's work on machine-readable travel documents actually began long before the appearance of Doc 9303—with the establishment of the ICAO Panel on Passport Cards in 1968. The Panel was tasked with developing recommendations for a standardized passport book or card that would be machine readable, thus facilitating the clearance of passengers through passport controls. Its recommendations took into account the cost effectiveness and reliability of different technologies, and culminated in the first edition of Doc 9303, then titled *A Passport with Machine-Readable Capability*. In those early days, Doc 9303 served as the guideline for issuing machine-readable passports in Australia, Canada and the United States.

Today, of course, it guides all of the world's States.

In 1984, ICAO established the Technical Advisory Group on Machine-Readable Travel Documents, or TAG/MRTD for short. This group is comprised of government officials who specialize in

border controls and, more specifically, the issuance of passports and other travel documents. The TAG/MRTD had an initial mandate of taking over the activities of the Panel on Passport Cards and, subsequently, the group's mandate was expanded to include machine-readable visas and cards.

For this Symposium we have the honour of having among the participants two very important players in the establishment and development of the MRTD Programme: Rod Heitmeyer, former Chief of the ICAO Joint Financing and Facilities Management Branch; and René Pouliot, Former Chief of the Organization's Facilitation Section and first Secretary of the TAG/MRTD. I would like to take this opportunity to thank these key players for their essential and important work in support of the MRTD Programme. The efforts and vision of these and other early TAG/MRTD contributors from ICAO, State governments and the ISO provided the firm foundation for this very successful programme as we know it today.

As an example of the work achieved in the early days, I hold in my hands the very first copy of Doc 9303. This working copy contains hand written notes from René Pouliot and we understand it was the same copy that was sent to the ISO for the purposes of homologating the standards and specifications established therein. We will continue to keep this precious document in our archives.

But enough of history. Let us focus on the current agenda, and today's realities.

Past accomplishments raise a fundamental question: How do we maximize the benefits of the MRTD Programme and ensure its continued relevance?

Very often we are asked whether the MRTD Programme is part of ICAO's facilitation work. At the dawn of the MRTD programme, the emphasis was indeed on passenger facilitation. Air passenger traffic was surging and the immediate concern was how to carry out border formalities more quickly and economically, in order to not hinder civil aviation operations. It was only logical on this basis that the early MRTD-related Standards and Recommended Practices (SARPs) were incorporated in Annex 9 – *Facilitation*, as is still the case.

Things changed fundamentally after 9/11, however. The facilitation agenda remains relevant and important, but in today's global security environment, the

The events of 11 September 2001 highlighted the need for States to adopt innovative and proactive approaches for combating terrorism and related trans-border crime. Many new approaches were tried, with some working better than others. But true global consensus was evident in the recognition that effective counter-terrorism measures have to be based on intelligence. Security threats are posed by individuals and groups. Knowledge about those persons and their intentions helps to predict the level of threat and empowers law enforcement agencies.

But unfortunately, intelligence applications can be circumvented by false identity. Even if a database indicates, say,

measures combined with effective use of intelligence and reliable identity management. While passenger screening certainly has a role to play, it remains just one layer of defence which, on occasion, can prove insufficient to ensure security.

As a result of incidents such as the NWA flight 253 bombing attempt, the 'security of the future' is likely to be more comprehensive, with numerous security layers reinforcing each other. However, there is no need to reinvent the wheel. Border security and law enforcement have been intelligence-led for decades, relying heavily on information collection, analysis and timely dissemination to front-line officers. It may be feasible to integrate border security best practices

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main focus of the MRTD Programme includes combating terrorism and transborder crimes by enhancing border security.

This brings us to another fundamental question. How did the MRTD Programme, which started as a set of technical specifications for globally interoperable passports and other travel documents, become a centre point in the contemporary global security agenda?

that John Smith is a suspected terrorist, no alert will be generated when this person crosses the border using someone else's name. This is why reliable identity management is the cornerstone of global intelligence-based counter-terrorism measures. And robust MRTD and identity management can be achieved only by complying with the relevant standards developed so successfully by ICAO. To prevent security incidents, we require passenger screening

with the aviation security process, enhancing both.

This, certainly, is food for thought—and I trust this Symposium will serve as an important forum for eliciting various views on where the MRTD Programme should move in the future. The programme's roadmap is our common concern, and the views of industry and government stakeholders will assist immensely with our policy review. ■



Confronting Risks and Maximizing Abilities

The following are the closing remarks of Barry J. Kefauver as presented to the attendees of the fall 2010 Sixth Symposium on ICAO MRTDs, Biometrics and Security Standards. Kefauver stressed the need for progress in this domain to be led by and tailored to specific government needs, noting that the hard work of ICAO and other stakeholders over the past decade has engendered a travel document and identity environment that is characterized by an unprecedented critical mass of expertise and technology to help meet all State priorities moving forward.

Those of you who have attended any or all of the preceding five Symposia will have seen by now that the nature and content of this year's Symposium has been different from any of those. The fundamental goal of this year's format was to look out over the next decade or so and develop a sense of purpose and direction and especially the needs of

Governments in the travel document and border control and security arenas. I think the speakers have not disappointed us in meeting these goals.

At this point, nearing the conclusion of our time together, I would like to draw some of these pieces into a something of a coherent whole, with that emphasis coming full circle to looking out over the coming decade to assess the roles and functions and purposes of travel documents, the next generation.

Summary of the Symposium

There is no doubt that Santayana's time-worn saying "those who do not learn from history are doomed to repeat it" has great relevance on where we stand today with respect to looking out over the time horizon toward the next generation of travel documents.

There have been so many significant issues and food for thought raised over the past several days. I will single out seven specific themes, but there are far too many to do justice to what we have learned at this Symposium. However, I will cite very briefly what I feel are those seven recurring themes.

First, what I will characterize as **Travel Authorizations**, within the generic frame of visas whether of an electronic context or not. Yesterday afternoon's very spirited discussion of these issues brought the substance of these areas home graphically. While not a new area of work focus for the ICAO Working

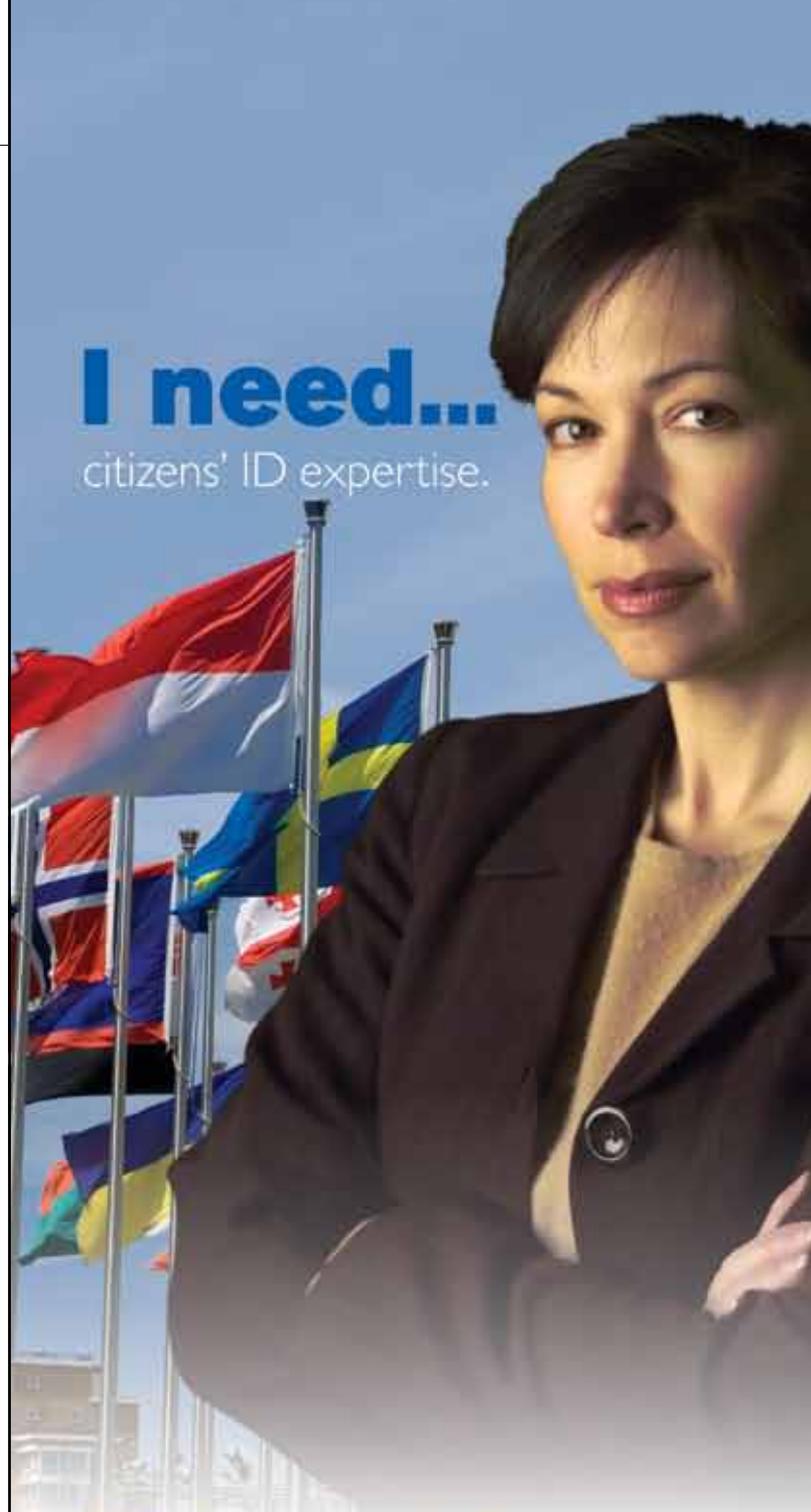
Groups, yesterday's discussion underscores anew the interest in the travel document community for attention to these concerns. Controversial and somewhat alien to the usual posture of shying away from the ways in which sovereign entities manage their borders, I heard a call yesterday asking to seek something of a middle ground that will assess the use of electronic and other means to accomplish travel authorizations that might lend more efficiency and effectiveness to what we now generically call the visa function.

*Second, **Inspection, Examination and the Use of Tools Such as PKI and PKD***, was cited by several speakers as important concerns that demand more and broader focus and attention by all of us. The time, effort, resources and emotion that we have all expended in the current generation of passports has resulted in over 250 million e-Passports in circulation and each day that number grows. The message from this Symposium is that now is the time for all to begin using the "e" in the e-Passport and reap the benefits of enhanced security and facilitation.

Third, the subject of **Evidence of Identity** was a thread that ran through a number of presentations, graphically conveying the need to address the foundations on which our travel documents are issued. I suggest that this important area of focus falls into both the passport as well as the visa spheres. The vulnerabilities that abound in the ways in which we determine eligibility and entitlement are many and varied and the pressures on these foundations are growing. Ranging from the civil registry systems that record births on through those that document death, and all of life that lies in between, all of these sources of identity data need shoring up with process improvements, best practices and where we can, the use of standards.

*Fourth, **capacity-building*** resonates in this Symposium hall as an area in which strides have been made and yet so much more yet to be done. The fact that almost all of the world's passport volume is now being issued as machine readable is a quantifiable and huge success. The concerted efforts of ICAO and its many partnerships in reaching this goal deserve commendation. However, those were yesterday and this is today, with a world filled with the needs of capacity enhancement. The success thus far merely whets the appetite for more. The scarcity of resources is a fact of life that must be acknowledged, but once having done so, all the more need to redouble the efforts and define carefully chosen priorities to insure that those scarce resources are targeted to the greatest areas of genuine need.

Fifth, the concept of **Integrity** was woven throughout the fabric of this Symposium by a number of speakers in a number of settings. While integrity is an umbrella factor that includes other considerations such as evidence of identity, I chose to single this as a conceptual and conscious theme unto itself.



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“Ranging from the ways in which we handle the raw materials that eventually comprise a passport book, through to the methods by which we deal with human resources, storage and processing facilities, and lastly how we structure the required legal frameworks for breaches such as passport and identity fraud, the issue of integrity is fundamental and absolute.”

Ranging from the ways in which we handle the raw materials that eventually comprise a passport book, through to the methods by which we deal with human resources, storage and processing facilities, and lastly how we structure the required legal frameworks for breaches such as passport and identity fraud, the issue of integrity is fundamental and absolute. The shifting face of threats such as document fraud, now segueing into identity fraud, has facilitated new and perhaps unknown methods of making mischief. Just as we have rallied ourselves to develop the world's most secure passport, so must we now gird to make certain that the systems on which those documents rely for their credibility are equally sound.

Sixth, the **Partnerships** that have been the building blocks of our past accomplishments must be reinforced, strengthened and expanded. We heard this from the UN CTITF, INTERPOL, OAS, CARICOM, ICMPD, OSCE, ISO and others who have not been able to attend this Symposium. The mortar that bonds these relationships must be continually renewed as we are facing up to dwindling resources and never ending travel document community needs. We heard about some success stories of meaningful and significant

accomplishment, particularly in the arena of capacity-building in its largest sense. I sense that we will be called upon even more over the coming months and only through that bond of singularity of purpose can we hope to meet the demands. Also, in the same sense that the foregoing are institutional partnerships, the Sixth Symposium, especially the speakers on the first day, called upon all of us, the multilateral dimensions of these partnerships to work harder and better to share critical data and information to make our borders stronger and the traveling public safer and sounder in their journeys. These are partnerships that we ourselves can forge and nurture.

Finally, *seventh*, and perhaps most loudly and most clearly was the cry of **Challenge that must be met with Commitment**. Several speakers used these exact words, while others by implication raised the same specter: That we face many challenges; together we must commit ourselves in order to meet them. To me, the first day was especially significant for this Symposium. On that day we heard from very senior people that what ICAO has done is important to the world and that which has yet to be done is even more important.

Now, usually we hear those kinds of pronouncements at gatherings such as the Symposium. However, this year among others I heard ICAO Secretary General Raymond Benjamin pledge his personal and institutional commitment to getting this job done. The speakers who followed over the next few days all have said that we will not let him down in carrying out that commitment.

The Future

As shaped by this Sixth Symposium, in my view we are poised on a very delicate and important point in the history of travel document standards, issuance and inspection. At last year's Symposium, it was observed that ICAO took a risk in entering the uncharted seas of biometrics, but that risk has paid off. I think we are going to encounter yet more areas of risk in the coming years. We need to prepare ourselves to be able to confront these risks and maximize our abilities to deal with them. The stakes have never been higher.

Throughout the Symposium I have tried to be attentive to threads and themes of continuity that might help shape a bit of what the future holds and give us something of an edge in dealing with

the unknowns. I have covered those in very skeletal fashion, but I think that is the role of a summary. However, there is one important and crucial thread that holds all of the rest together: ICAO is the fulcrum around which the implementation of travel document and border management programs revolves. The Annex 9 and other related provisions acceded to by all 192 Member States clearly look to ICAO as the center of the travel document universe.

Always important, but now more than ever before, the work of ICAO and its partnerships will revolve around policy directions, the determinations of what the world's governments need from travel document functionality and from that the kinds of technologies that will best make those goals into realities. To assist in this, this coming year will see the work begin for the issuance of the next ICAO Request for Information, which is the medium through which the travel document community as a whole can communicate with industry, spell out what needs to be done and to seek the kinds of technologies to carry it out. The first RFI in 1995 specifically sought biometrics and data carrying media and resulted directly in facial recognition and contactless chips.

This was a direct result of the Governments collaborating and deciding that the global priorities were to be focused on



biometrics and the kinds of ways in which that data could be carried in travel documents. It is now time to develop that vision of the future to be able to clearly articulate those emerging and new long term needs and the kinds of Government policy objectives that need to be served by industry.

We have great travel document challenges ahead. As well, within the ICAO community we have a greater and more cohesive critical mass than we have ever had before to meet those challenges. I thank all of you for your time and attention throughout the Symposium and I look forward to the next steps of our next travel document generation. ■

A man in a dark suit and light blue tie is looking to his right. He is holding a red Datacard ID card. The background is a blurred airport or travel setting with other people in the distance.

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Placing Renewed Priority on MRTD and Related Capacity-Building Efforts

Current MRTD specifications, as reflected in the latest version of Doc 9303, are elaborate and effective and in line with the practices now established in the world's most developed States. Given the complexity of the related technologies and processes needed to implement them, however, numerous States in less-developed areas of the world are still struggling to comply with them due to a lack of local technical expertise, funding or both.

In this review of two important Capacity-Building events held during 2010 in Montevideo, Uruguay and Maputo, Mozambique, the *MRTD Report* reviews the need for increased efforts by ICAO, States and partnering specialized agencies to improve the quality and level of assistance available to less-advanced nations as all stakeholders in this important global security and mobility regime seek to better fortify today's worldwide travel document and border security framework.

The ICAO Machine-Readable Travel Document (MRTD) programme has gained considerable momentum since its inception four decades ago. It continues today to provide global leadership in setting and maintaining standards and specifications on MRTDs as contained in Document 9303 (Doc 9303), which remains its core function.

Doc 9303 currently consists of five solid and comprehensive volumes, covering machine-readable passports, visas and ID cards. It is no longer limited to specifications

covering how to produce and personalize MRTDs but rather increasingly addresses the integrity of issuance processes, identity fraud prevention, robust security features, etc., all in a much more proactive manner than had been the case when it was first conceived.

Doc 9303 covers not just MRTDs but also e-MRTDs, i.e. travel documents enhanced with biometric data stored on a chip. This introduction of biometric data was a great leap forward in MRTD evolution and has significantly enhanced passenger facilitation while simultaneously

buttressing security benefits by dramatically reducing identity fraud.

The Case for Increased Capacity-Building Globally

An urgent need has developed in recent years for MRTD and e-MRTD capacity-building efforts worldwide. The current MRTD specifications, as reflected in the latest version of Doc 9303, are elaborate and effective and in line with the practices of the most developed States. Given the complexity of the related technologies and processes required, however, numerous States in less-developed areas of the world have been struggling with implementing them due mainly to a lack of local technical expertise, funding or both.

Border control and identity management concerns also illustrate a strong need for improved State outreach by ICAO, notably in close collaboration with States



Participants at the Maputo Regional Seminar on Machine Readable Travel Documents (MRTDs), Biometrics and Security Standards, held in November 2010. Advocacy of MRTD standards and technical consultations to assist States with their related implementations are a vital part of ICAO's MRTD Capacity-Building efforts.

“The Americas and Caribbean have a long history of cross-border migration and, in many instances, weaknesses in border control and identity management. For the past decade, population mobility and effective border controls have become a matter of even greater concern for governments in the region, due largely to the rise of irregular migration and trans-border crime.”

and partner security and law enforcement organizations. While the more effective border and identity controls that result from these efforts may not eliminate terrorism and related trans-border crime, they do reduce related risks dramatically and offer a powerful tool to mitigate and counter such threats.

The 9/11 and Bali terrorist attacks and the failed terror plot of 25th December 2009, among others, have clearly highlighted the importance of effective travel document security, identity management and intelligence-led passenger processing for preventing and combatting such crime. The use of false identities and fraudulent travel documents remains an important modus operandi that tends to be exploited by trans-border criminal networks, with deficiencies in these areas in any State having direct implications on today's global security agenda.

All of these factors, taken together, have been compromising the benefits of universal MRTD implementation and weakening global security and law enforcement efforts. This situation has led to a call for a closer and more comprehensive technical dialogue with States in need, intensified liaison with donor agencies and expanded capacity-building programmes in general.

Focus on the Americas and Caribbean

The Americas and Caribbean have a long history of cross-border migration and, in many instances, weaknesses in border control and identity management. For the past decade, population mobility and effective border controls have become a matter of even greater concern for governments in the region, due largely to the rise of irregular migration and trans-border crime.

In addition, the linkages between national (and regional) security and

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Participants at the Montevideo Seminar were also provided with a technical exhibition by industry suppliers featuring some of the latest travel document and border security developments.

border controls have prompted governments to factor international organized crime and terrorism threats into the measures being taken to strengthen their migration and identity management systems. The resulting need for enhanced border and identity capacity-building strategies has emerged as a priority for both individual governments and regional bodies.

As a direct result of these needs, ICAO has been working closely with regional agencies in the Americas, particularly those with a direct mandate to combat terrorism and trans-border crime. In June 2010, ICAO therefore undertook a joint effort with the Organization of American States' (OAS) Secretariat of the Inter-American Committee against Terrorism (CICTE) in organizing a Sub-regional Workshop for the South Cone on Best Practices in Document Security and Fraud Prevention in Montevideo, Uruguay.

The objective of ICAO's participation in the Montevideo Workshop was to provide the Sub-regional American South Cone States with practical and 'hands-on' MRTD technical expertise. The Organization provided support to the OAS/CICTE by jointly organizing the Workshop and through the provision of detailed technical consultations on MRTD and identity management

matters. Lastly, ICAO worked with the OAS/CICTE to help identify remaining capacity gaps in the region and to explore the prospects of developing further joint ICAO-OAS/CICTE activities in the future.

The main messages that emerged from Montevideo Workshop discussions and working group recommendations included:

- That the main MRTD-related and border security challenges in the region are:

1. Breeder documents and civil registries.
2. Insufficient inter-agency and cross-border data sharing to prevent and combat identity fraud.

- The importance of establishing greater continuity when organizing these regional workshops, including strengthening inter-agency and cross-border cooperation and data sharing in the Southern part of Latin America specifically.

It was suggested to focus on these two priority fields when developing future MRTD capacity-building activities in the Mercosur region. All Contracting States in the region have ICAO-compliant Passports and do not require particular assistance in this area.

As a compliment to the June Montevideo Workshop, ICAO and the Latin American Civil Aviation Commission (LACAC), with the support of the OAS/CICTE, also held the first ICAO/LACAC Regional Seminar on Machine Readable Travel Documents (MRTDs), Biometrics and Security Standards for the Americas, in Montevideo the following month. The event was attended by over 160 participants from 28 States, mainly those local to the region, but with additional participants in attendance from Africa and Asia.



Attendees to the Montevideo Capacity-Building event in the Americas. The main MRTD-related and border security challenges in the region were identified as breeder documents and civil registries, in addition to insufficient inter-agency and cross-border data sharing to prevent and combat identity fraud.

“The diversity of the participants in attendance at the Maputo Seminar and Workshop highlighted the importance that both government agencies and the private sector place on travel documents, border security, combating terrorism and trans-border crime.”

Participants to the July 2010 Seminar included senior officials from appropriate departments in national administrations, including civil registry and identification card authorities, passport issuing offices, immigration, customs and other border control and security authorities. Officials from airlines and airports involved in passenger service systems and the handling of travel documents also benefited from the event.

The Seminar was designed to highlight the role of the ICAO MRTD Programme in ensuring MRTD interoperability, promoting enhanced facilitation, increasing confidence in the reliability of travel documents, and contributing to national and international security. The event also promoted ICAO-compliant secure travel

documents and a robust identity management regime as powerful tools in preventing and combating terrorism and transnational crimes.

Seminar participants were briefed on the progress made with local Machine Readable Passport (MRP) issuance projects in Paraguay and Colombia. INTERPOL additionally provided a presentation on its related programmes and global database law enforcement support systems. An exhibition, as well as presentations from eight participating vendors, complemented the Seminar, highlighting important products and services related to MRTDs, biometric identification, security applications and border inspection systems.

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In her opening remarks to the Maputo participants, Folasade Odutola, Director of the ICAO Air Transport Bureau, stressed the emphasis placed by the 37th Assembly Declaration on Aviation Security on travel document security, identity management and data sharing as vital components of an effective security strategy.

Focus on Maputo

ICAO, with the support of the Government and Civil Aviation Authority of Mozambique, also held a Regional Seminar on Machine Readable Travel Documents (MRTDs), Biometrics and Security Standards last November in Maputo. Close to 100 government officials from 35 States in Africa and the Middle East took part in the Seminar and its complementary capacity-building workshop.

The main agencies represented at the Maputo Seminar were local State passport and immigration officials, law enforcement agencies and border control stakeholders, Ministries of the Interior, airport authorities and embassy staff. The Seminar addressed ICAO MRTD specifications, identity management norms and related border security issues with a particular focus on issues and developments relating to Africa and the Middle East.

The final day was devoted to capacity-building challenges, with particular reference to travel document and border security gaps in the region which could be assisted by the international community

through more robust and comprehensive technical cooperation projects.

In her opening remarks to the Maputo participants, Folasade Odutola, Director of the ICAO Air Transport Bureau, stressed the emphasis placed by the 37th Assembly Security Declaration on travel document security, identity management

and data sharing as vital components of an effective security strategy.

She highlighted that the Declaration calls for intensified and expanded use of the ICAO Public Key Directory and INTERPOL's Stolen and Lost Travel Document Database in combating identity fraud, and that it also calls for more intelligent aviation security processes in terms of information collection, analysis and timely data sharing among and between agencies and States. Odutola encouraged States to share their expertise and apply best practices to strengthen travel document security and improve fraud detection.

Odutola also recognized that the event was particularly privileged to have David Philp, Chair of the TAG/MRTD Implementation and Capacity-Building Working Group (ICBWG), in attendance to facilitate the Maputo capacity-building workshop.

In the event's closing remarks, Geoffrey Moshabesha, former ICAO Regional Director, Nairobi, noted that the Seminar and Workshop proceedings had presented an opportunity for participants to discuss practical ways to collaborate on and strengthen MRTD



Geoffrey Moshabesha, former ICAO Regional Director in Nairobi, highlighted how the diversity of the participants at the Maputo Seminar and Workshop demonstrated the importance that both government agencies and the private sector place on the security and facilitation concerns that were under discussion.

implementation and border security capacities in the region, so that States and their societies could benefit from enhanced security and facilitation that the MRTD programme offers.

Moshabesha also stressed how the diversity of the participants in attendance at the Maputo Seminar and Workshop highlighted the importance that both government agencies and the private sector place on travel documents, border security, combating terrorism and trans-border crime. He commented that although much had been achieved in Maputo, much more still remained to be done and that the goal must remain universal implementation of the strongest specifications and programmes available.

In closing Moshabesha thanked Antonio Pinto, Representative of Mozambique to ICAO, for his outstanding efforts in helping to coordinate and carry out the Maputo Seminar.

A Key Asset in Present and Future Capacity-Building Efforts: The TAG/MRTD ICBWG

An important asset in supporting ICAO MRTD capacity-building work has been the TAG/MRTD ICBWG. Established

in May 2008, the ICBWG has become an international framework that helps developing States to address their capacity gaps in travel document security, identity management and border security through providing technical expertise and developing capacity-building interventions. The ICBWG has been proactive in engaging States in need of assistance, the donor community and other partner international agencies in tackling the identity management and border control challenges in a concerted and cooperative manner.

Advocacy of MRTD standards and technical consultations to assist States with their related implementations are also a vital part of MRTD capacity-building efforts. Some capacity gaps require longer-term structural reforms and significant resources from the international community, which can be delivered through technical cooperation projects.

The ICAO MRTD programme has been consolidating and expanding MRTD capacity-building globally, including in Africa and the Americas, in order to be able to deliver technical assistance to States in need. This includes strengthening the MRTD programme's project implementation capacity, intensifying project development and donor liaison, and capitalizing on the ICBWG's ongoing support in identifying capacity gaps worldwide. ■



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The *MRTD Report* recently spoke with Raphael F. Perl, OSCE Head on Anti-Terrorism Issues, concerning his Organization's ongoing cooperation with ICAO and its current priorities in the areas of travel documents, border security and facilitation. Perl was joined on the occasion by Christopher Hornek and Ben Hiller, of the Organization's Action against Terrorism Unit (ATU), who provided substantive input and background during the course of this discussion.

ICAO MRTD Report: What are the main objectives of the OSCE mandate concerning Travel Document Security (TDS)?

Raphael F. Perl: The OSCE, as the world's largest regional security organization, brings together 56 countries who together work on security from the perspective of political-military, economic, environmental and human elements. We bring a unique vision to all security-related issues, including travel document security, since for us it is not only about countering crime or fighting trafficking, it is also about improving economic trade flows and facilitating the movement of people.

Improving travel document security throughout the OSCE region is a core activity of our Organization's counter-terrorism agenda and makes key contributions in fighting other transnational threats such as organized crime, illegal migration and trafficking in human beings. Everything in this regard began in 2001, when the Bucharest Plan of Action provided the foundation of our mandate. In the Plan, the OSCE States decided to prevent the movement of terrorist individuals or groups through more effective border controls and improved management of the issuance of identity papers and travel documents. The Plan of Action also includes measures to ensure the security of identity

papers and travel documents while preventing their counterfeiting, forgery and fraudulent use.

The OSCE therefore has two primary objectives: facilitating the work of international organizations and major specialized agencies, such as ICAO and INTERPOL; and providing a platform for raising awareness and establishing direct assistance opportunities for OSCE States.



Raphael F. Perl

Has this mandate changed since it was first introduced?

Absolutely. The OSCE travel document security mandate has significantly changed since it was first introduced. Over the years it has grown into a very substantial and comprehensive programme.

Building on the Bucharest Plan of Action, subsequent OSCE Ministerial Councils decisions have given our work a more practical dimension. These decisions have focused on turning ICAO standards and INTERPOL solutions into concrete OSCE commitments.

The most recent development in our mandate came in 2009 when the OSCE States took note of the wide scale implementation of e-MRTDs and decided to consider participating in the ICAO Public Key Directory (PKD). Subsequently, the ATU and ICAO,

in cooperation with the PKD Board, co-organized an expert workshop designed to raise awareness amongst OSCE members for participating in and employing the ICAO PKD.

Would the OSCE foresee any further improvements or adaptations in the near future?

Looking to the future, two main areas emerge. **Bringing border control systems up to speed** so that they can take full advantage of the inspection tools presented by e-MRTDs. In particular, this means proving the authenticity of electronic travel documents via the ICAO PKD. If the biographic and biometric content of an e-MRTD can be trusted, it opens the way for introducing kiosks to automate aspects of border clearance. The checking of databases such as INTERPOL's should also be integrated into the inspection process.

The second main area involves **strengthening the evidence of identity approach** by reinforcing the vetting processes taking place when citizens apply for travel documents. This includes modernizing civil registry systems and other media used to prove identity. Identity fraud not only has negative effects for travel security, but also for a number of domestic functions and social services, which represent the basis for a well-functioning state infrastructure. Improving these conditions will strengthen the rule of law and help address long-term conditions that terrorists exploit.

How important does the OSCE feel that ICAO's PKD will be to the viability of the future e-MRTD border control environment?

The PKD will be very important to the viability of the future e-MRTD border control environment. When the OSCE

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and ICAO co-organized the PKD Workshop in Vienna in May 2010, our organizations co-developed the principle that: *“e-MRTDs and participation in the ICAO PKD are an indivisible component of document and border security”*. We still believe that this statement rings true today and that it clearly emphasizes the importance of the ICAO PKD.

Promoting participation in the PKD enhances trust in e-MRTDs. This in turn facilitates faster and more secure cross border movements. The PKD is central to strengthening the security and trustworthiness of any State’s e-MRTD framework and has benefitted from years of development and operation.

I believe one of the most important messages that ICAO and the OSCE can send is that modern techniques should be used when inspecting e-MRTDs. This means reading the chip and validating its data via the ICAO PKD. Otherwise, when the document is being checked, only part of the security potential is utilized. Lack of e-MRTD validation will in the long-run undermine the security potential of the document and could even erode trust in e-MRTDs altogether. That is why it is important that we promote the use of the PKD.

Of course, these techniques are by no means designed to replace police work: they do, however, provide police with additional and useful tools to make the process secure and fast.

Although many States already issue e-MRTDs, not all of them are prepared to validate them. However, an increasing number of States is beginning to prepare themselves for this type of inspection. I believe that participation in the ICAO PKD will grow and will become the norm for validating e-MRTD data. The alternative method of exchanging certificates bilaterally is simply error prone, cumbersome and ineffective.

What are the most challenging areas presently facing the OSCE and ICAO with respect to greater PKD adoption and participation by States?

The two most challenging areas facing our Organizations with respect to PKD are, one, communicating technical issues at the policy level and, two, encouraging a policy of introducing e-MRTDs in parallel with participation in the PKD.

One of the main challenges will be to effectively communicate very complex issues—the PKD, Public Key Infrastructure schemes and e-MRTDs—at both the policy and practical implementation levels. We need to do so without losing the attention to detail needed in matters of technical standards and interoperability. A prime example of this type of communication work is the ATU’s Policy Brief on the ICAO PKD, which was posted on the ICAO web site.

MAIN OBJECTIVES OF THE OSCE ATU



The Action against Terrorism Unit’s (ATU) Travel Document Security programme has four main objectives:

- Promoting technological upgrades of ICAO compliant e-MRTDs and participation in the ICAO Public Key Directory (PKD).
- Safeguarding identity through the promotion of the ICAO minimum security standards for the handling and issuance of passports, as well as other travel documents.
- Facilitating real-time connection to INTERPOL databases at border control, including those for lost and stolen travel documents and wanted individuals.
- Training border personnel in forged document detection, in cooperation with the Austrian Ministry of the Interior.

We also need to encourage a policy of introducing e-MRTDs in parallel with participation in the PKD. From the outset, States should plan and budget for participating in the ICAO PKD as they are undergoing their e-MRTD upgrade projects. A related policy challenge is combining document upgrades with the development of robust identity protection systems and modern civil registries. This will enhance a country’s ability to prevent terrorists or other criminals from obtaining a genuine e-MRTD under a false identity.

All of the above will help to protect the foundations of identity security and will promote broader national security and mobility objectives in areas such as aviation, trade and social services.



How valuable has ICAO's assistance and support been to the OSCE's objective of promoting more effective TDS?

ICAO's assistance and support has been very valuable and has clearly enhanced the OSCE's objective of promoting more effective Travel Document Security. The OSCE and ICAO have an effective partnership

and our organizations mutually reinforce each others' activities.

ICAO in this regard serves as the global fulcrum around which the international travel document community revolves. The OSCE, meanwhile, is a regional organization within the UN system and ICAO's standard setting for e-MRTDs and its PKD represents the point of

area. Our aim and remit is to transmit standards from the global level to the sub-regional and national levels. Think of the OSCE as a conveyor belt.

ICAO has been very supportive in this process, both as a facilitator and as a consultative mechanism on strategic matters and processes. The expert support from the ICAO Secretariat

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has been invaluable for the OSCE during our joint OSCE-wide workshops in Vienna in 2004, 2007 and 2010, as well as other regional and national seminars.

Equally important, however, is the support the OSCE provides ICAO. For example, the 2010 PKD workshop in Vienna centered on promoting participation in the ICAO PKD. Over the years, we have consistently promoted ICAO e-MRTDs standards and specifications.

The OSCE sees itself as a multiplying force in terms of outreach and capacity-building for ICAO. I am confident that ICAO similarly receives significant benefits and returns through partnering with the OSCE.

What plans does the OSCE have to partner further with ICAO in this area?

The ICAO PKD, the inspection of e-MRTDs and the Evidence of Identity approach are all areas where we look forward to expanding our partnership with ICAO.

Moreover, requests for OSCE travel document security assistance are increasing and we want to meet these requests in cooperation with ICAO. Naturally, in a busy year such as the last one, it would have been impossible to include the ICAO Secretariat in every capacity-building activity, especially considering ICAO's other global responsibilities and programmes.

The efficient division of labour between the OSCE and ICAO is a positive example of how our organizations have created tailor-made approaches to implement the UN Global Counter-Terrorism Strategy. This was underscored by the last UN General Assembly discussions regarding this matter, which highlighted the role of regional organizations in the implementation of global standards.

Certainly we have an excellent working relationship. However even the best of partnerships can be improved upon. We look forward to working closely with ICAO on travel document security, an issue which is central to the functioning of our modern, globalized world. ■

China Imports its PKD Country Signing Certificate Authority



On 30 November 2010, China Imported its Country Signing Certificate Authority (CSCA) in the PKD. The ceremony took place in the ICAO PKD Operations Center.

By importing its CSCA into the PKD, China will enable the validation of its e-Passports and ensure that these travel documents are genuine and unaltered.

The representatives attending the Ceremony were, from left to right: Han Xiaoxi; Sun Xiaowu, First Secretary of the Ministry of Foreign Affairs; Christiane DerMarkar, Joint Financing Officer, Air Transport Bureau; Claude Gauthier, Acting Chief, Joint Financing, Air Transport Bureau; Tao Ma, Representative of China on the ICAO Council; Zheng Xuan; and Chunyu Ding, Alternate Representative of China on the ICAO Council.

Mark Your Calendar!

Seventh ICAO Symposium on ICAO MRTDs, Biometrics and Security Standards

12–15 September 2011, ICAO HQ, Montreal, Canada

ICAO will hold its Seventh Symposium and Exhibition on ICAO MRTDs, Biometrics and Security Standards from 12–15 September 2011. An Exhibition will complement the Symposium and highlight important products and services related to MRTDs, biometric identification and border inspection systems.

The 2011 Symposium follows last year's successful event, attended by approximately 600 participants from national governments, international organizations, companies and institutions. It will be of particular interest to officials of passport and official ID document issuing agencies, immigration, customs, and other border control and security authorities. Officials from airlines and airports involved in passenger service systems, handling of travel documents, facilitation and aviation security would also benefit by attending.

TAG-MRTD/20

7–9 September 2011, ICAO HQ, Montreal, Canada

ICAO's Technical Advisory Group on Machine Readable Travel Documents (TAG-MRTD) is responsible for the development of specifications for travel documents with the goal of global interoperability. In addition, the TAG-MRTD seeks to advise ICAO on technology issues related to the issuance and use of machine-readable travel documents.

New Technologies Working Group 2010/11 Request for Information (RFI)

The International Civil Aviation Organization (ICAO) Technical Advisory Group on Machine Readable Travel Documents (TAG-MRTD) is responsible for the development of specifications for travel documents with the goal of global interoperability. In addition, the TAG-MRTD seeks to advise ICAO on technology issues related to the issuance and use of machine readable travel documents.

The TAG-MRTD, through its New Technologies Working Group (NTWG), issues an RFI every three years in order to keep abreast of new and improving technologies from vendors. Relevant information gathered during the RFI process is summarized and shared among the 190 ICAO Contracting States. ICAO also considers this information when international standards are developed.

For more information and registration, please visit <http://mrt.d.icao.int>

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This glossary is included to assist the reader with terms that may appear within articles in the ICAO MRTD Report. This glossary is not intended to be authoritative or definitive.

Anti-scan pattern An image usually constructed of fine lines at varying angular displacement and embedded in the security background design. When viewed normally, the image cannot be distinguished from the remainder of the background security print, but when the original is scanned or photocopied the embedded image becomes visible.

Biographical data (biodata) The personalized details of the bearer of the document appearing as text in the visual and machine readable zones on the biographical data page of a passport book, or on a travel card or visa.

Biometric A measurable, physical characteristic or personal behavioural trait used to recognize the identity, or verify the claimed identity, of an enrollee.

Biometric data The information extracted from the biometric sample and used either to build a reference template (template data) or to compare against a previously created reference template (comparison data).

Biometric sample Raw data captured as a discrete unambiguous, unique and linguistically neutral value representing a biometric characteristic of an enrollee as captured by a biometric system (for example, biometric samples can include the image of a fingerprint as well as its derivative for authentication purposes).

Biometric system An automated system capable of:

1. capturing a biometric sample from an end user for a MRP;
2. extracting biometric data from that biometric sample;
3. comparing that specific biometric data value(s) with that contained in one or more reference templates;
4. deciding how well the data match, i.e. executing a rule-based matching process specific to the requirements of the unambiguous identification and person authentication of the enrollee with respect to the transaction involved; and
5. indicating whether or not an identification or verification of identity has been achieved.

Black-line/white-line design A design made up of fine lines often in the form of a guilloche pattern and sometimes used as a border to a security document. The pattern migrates from a positive to a negative image as it progresses across the page.

Capture The method of taking a biometric sample from the end user.

Certificating authority A body that issues a biometric document and certifies that the data stored on the document are genuine in a way which will enable detection of fraudulent alteration.

Chemical sensitizers Security reagents to guard against attempts at tampering by chemical erasure, such that irreversible colours develop when bleach and solvents come into contact with the document.

Comparison The process of comparing a biometric sample with a previously stored reference template or templates. See also “One-to-many” and “One-to-one.”

Contactless integrated circuit An electronic microchip coupled to an aerial (antenna) which allows data to be communicated between the chip and an encoding/reading device without the need for a direct electrical connection.

Counterfeit An unauthorized copy or reproduction of a genuine security document made by whatever means.

Database Any storage of biometric templates and related end user information.

Data storage (Storage) A means of storing data on a document such as a MRP. Doc. 9303, Part 1, Volume 2 specifies that the data storage on an ePassport will be on a contactless integrated circuit.

Digital signature A method of securing and validating information by electronic means.

Document blanks A document blank is a travel document that does not contain the biographical data and personalized details of a document holder. Typically, document blanks are the base stock from which personalized travel documents are created.

Duplex design A design made up of an interlocking pattern of small irregular shapes, printed in two or more colours and requiring very close register printing in order to preserve the integrity of the image.

Embedded image An image or information encoded or concealed within a primary visual image.

End user A person who interacts with a biometric system to enroll or have their identity checked.

Enrollment The process of collecting biometric samples from a person and the subsequent preparation and storage of biometric reference templates representing that person’s identity.

Enrollee A human being, i.e. natural person, assigned an MRTD by an issuing State or organization.

ePassport A Machine Readable Passport (MRP) containing a contactless integrated circuit (IC) chip within which is stored data from the MRP data page, a biometric measure of the passport holder and a security object to protect the data with Public Key Infrastructure (PKI) cryptographic technology, and which conforms to the specifications of Doc. 9303, Part 1.

Extraction The process of converting a cap-tured biometric sample into biometric data so that it can be compared to a reference template.

Failure to acquire The failure of a biometric system to obtain the necessary biometric to enroll a person.

Failure to enroll The failure of a biometric system to enroll a person.

False acceptance When a biometric system incorrectly identifies an individual or incorrectly verifies an impostor against a claimed identity.

False Acceptance Rate (FAR)

The probability that a biometric system will incorrectly identify an individual or will fail to reject an impostor. The rate given normally assumes passive impostor attempts. The false acceptance rate may be estimated as $FAR = NFA / NIIA$ or $FAR = NFA / NIVA$ where FAR is the false acceptance rate, NFA is the number of false acceptances, NIIA is the number of impostor identification attempts, and NIVA is the number of impostor verification attempts.

False match rate Alternative to “false acceptance rate;” used to avoid confusion in applications that reject the claimant if their biometric data matches that of an enrollee. In such applications, the concepts of acceptance and rejection are reversed, thus reversing the meaning of “false acceptance” and “false rejection.”

False non-match rate Alternative to “false rejection rate;” used to avoid confusion in applications that reject the claimant if their biometric data matches that of an enrollee. In such applications, the concepts of

acceptance and rejection are reversed, thus reversing the meaning of “false acceptance” and “false rejection.”

False rejection When a biometric system fails to identify an enrollee or fails to verify the legitimate claimed identity of an enrollee.

False Rejection Rate (FRR)

The probability that a biometric system will fail to identify an enrollee or verify the legitimate claimed identity of an enrollee. The false rejection rate may be estimated as follows: $FRR = NFR / NEIA$ or $FRR = NFR / NEVA$ where FRR is the false rejection rate, NFR is the number of false rejections, NEIA is the number of enrollee identification attempts and NEVA is the number of enrollee verification attempts. This estimate assumes that the enrollee identification/verification attempts are representative of those for the whole population of enrollees. The false rejection rate normally excludes “failure to acquire” errors.

Fibres Small, thread-like particles embedded in a substrate during manufacture.

Fluorescent ink Ink containing material that glows when exposed to light at a specific wavelength (usually UV) and that, unlike phosphorescent material, ceases to glow immediately after the illuminating light source has been extinguished.

Forgery Fraudulent alteration of any part of the genuine document, e.g. changes to the biographical data or the portrait.

Front-to-back (see-through) register

A design printed on both sides of the document or an inner page of the document which, when the page is viewed by transmitted light, forms an interlocking image.

Full frontal (facial) image A portrait of the holder of the MRP produced in accordance with the specifications established in Doc. 9303, Part 1, Volume 1, Section IV, 7.

Gallery The database of biometric templates of persons previously enrolled, which may be searched to find a probe.

Global interoperability The capability of inspection systems (either manual or automated) in different States throughout the world to obtain and exchange data, to process data received from systems in other States, and to utilize that data in inspection operations in their respective States. Global interoperability is a major objective of the standardized specifications for placement of both eye readable and machine readable data in all ePassports.

Guilloche design A pattern of continuous fine lines, usually computer generated, and forming a unique image that can only be accurately re-originated by access to the equipment, software and parameters used in creating the original design.

Heat-sealed laminate A laminate designed to be bonded to the biographical data page of a passport book, or to a travel card or visa, by the application of heat and pressure.

Holder A person possessing an ePassport, submitting a biometric sample for verification or identification while claiming a legitimate or false identity. A person who interacts with a biometric system to enroll or have their identity checked.

Identification/Identify The one-to-many process of comparing a submitted biometric sample against all of the biometric reference templates on file to determine whether it matches any of the templates and, if so, the identity of the ePassport holder whose template was matched. The biometric system using the one-to-many approach is seeking to find an identity amongst a database rather than verify a claimed identity. Contrast with “Verification.”

Identifier A unique data string used as a key in the biometric system to name a person’s identity and its associated attributes. An example of an identifier would be a passport number.

Identity The collective set of distinct personal and physical features, data and qualities that enable a person to be definitively identified from others. In a biometric system, identity is typically

established when the person is registered in the system through the use of so-called “breeder documents” such as birth certificate and citizenship certificate.

Image A representation of a biometric as typically captured via a video, camera or scanning device. For biometric purposes this is stored in digital form.

Impostor A person who applies for and obtains a document by assuming a false name and identity, or a person who alters his physical appearance to represent himself as another person for the purpose of using that person’s document.

Infrared drop-out ink An ink which forms a visible image when illuminated with light in the visible part of the spectrum and which cannot be detected in the infrared region.

Inspection The act of a State examining an ePassport presented to it by a traveler (the ePassport holder) and verifying its authenticity.

Intaglio A printing process used in the production of security documents in which high printing pressure and special inks are used to create a relief image with tactile feel on the surface of the document.

Issuing State The country writing the biometric to enable a receiving State (which could also be itself) to verify it.

JPEG and JPEG 2000 Standards for the data compression of images, used particularly in the storage of facial images.

Laminate A clear material, which may have security features such as optically variable properties, designed to be securely bonded to the biographical data or other page of the document.

Laser engraving A process whereby images (usually personalized images) are created by “burning” them into the substrate with a laser. The images may consist of both text, portraits and other security features and are of machine readable quality.

Laser-perforation A process whereby images (usually personalized images) are created by perforating the substrate with a laser. The images may consist of both text and portrait images and appear as positive images when viewed in reflected light and as negative images when viewed in transmitted light.

Latent image A hidden image formed within a relief image which is composed of line structures which vary in direction and profile resulting in the hidden image appearing at predetermined viewing angles, most commonly achieved by intaglio printing.

LDS The Logical Data Structure describing how biometric data is to be written to and formatted in ePassports.

Live capture The process of capturing a biometric sample by an interaction between an ePassport holder and a biometric system.

Machine-verifiable biometric feature A unique physical personal identification feature (e.g. an iris pattern, fingerprint or

facial characteristics) stored on a travel document in a form that can be read and verified by machine.

Match/Matching The process of comparing a biometric sample against a previously stored template and scoring the level of similarity. A decision to accept or reject is then based upon whether this score exceeds the given threshold.

Metallic ink Ink exhibiting a metallic-like appearance.

Metameric inks A pair of inks formulated to appear to be the same colour when viewed under specified conditions, normally daylight illumination, but which are a mismatch at other wavelengths.

Microprinted text Very small text printed in positive and or negative form, which can only be read with the aid of a magnifying glass.

MRTD Machine Readable Travel Document, e.g. passport, visa or official document of identity accepted for travel purposes.

Multiple biometric The use of more than one biometric.

One-to-a-few A hybrid of one-to-many identification and one-to-one verification. Typically the one-to-a-few process involves comparing a submitted biometric sample against a small number of biometric reference templates on file. It is commonly referred to when matching against a “watch list” of persons who warrant detailed identity investigation or are known criminals, terrorists, etc.

One-to-many Synonym for “Identification.”

One-to-one Synonym for “Verification.”

Operating system A programme which manages the various application programmes used by a computer.

Optically Variable Feature (OVF) An image or feature whose appearance in colour and/or design changes dependent upon the angle of viewing or illumination. Examples are: features including diffraction structures with high resolution (Diffractive Optically Variable Image Device (DOVID), holograms, colour-shifting inks (e.g. ink with optically variable properties) and other diffractive or reflective materials.

Optional data capacity expansion technologies

Data storage devices (e.g. integrated circuit chips) that may be added to a travel document to increase the amount of machine readable data stored in the document. See Doc. 9303, Part 1, Volume 2, for guidance on the use of these technologies.

Overlay An ultra-thin film or protective coating that may be applied to the surface of a biographical data or other page of a document in place of a laminate.

Penetrating numbering ink Ink containing a component that penetrates deep into a substrate.

Personalization The process by which the portrait, signature and biographical data are applied to the document.

Phosphorescent ink Ink containing a pigment that glows when exposed to light of a specific wavelength, the reactive glow remaining visible and then decaying after the light source is removed.

Photochromic ink An ink that undergoes a reversible colour change when exposed to UV light.

Photo substitution A type of forgery in which the portrait in a document is substituted for a different one after the document has been issued.

Physical security The range of security measures applied within the production environment to prevent theft and unauthorized access to the process.

PKI The Public Key Infrastructure methodology of enabling detection as to whether data in an ePassport has been tampered with.

Planchettes Small visible (fluorescent) or invisible fluorescent platelets incorporated into a document material at the time of its manufacture.

Probe The biometric template of the enrollee whose identity is sought to be established.

Rainbow (split-duct) printing
A technique whereby two or more colours of ink are printed simultaneously by the same unit on a press to create a controlled merging of the colours similar to the effect seen in a rainbow.

Random access A means of storing data whereby specific items of data can be retrieved without the need to sequence through all the stored data.

Reactive inks Inks that contain security reagents to guard against attempts at tampering by chemical erasure (deletion), such that a detectable reaction occurs when bleach and solvents come into contact with the document.

Read range The maximum practical distance between the contactless IC with its antenna and the reading device.

Receiving State The country reading the biometric and wanting to verify it.

Registration The process of making a person's identity known to a biometric system, associating a unique identifier with that identity, and collecting and recording the person's relevant attributes into the system.

Relief (3-D) design (Medallion)
A security background design incorporating an image generated in such a way as to create the illusion that it is embossed or debossed on the substrate surface.

Score A number on a scale from low to high, measuring the success that a biometric probe record (the person being searched for) matches a particular gallery record (a person previously enrolled).

Secondary image A repeat image of the holder's portrait reproduced elsewhere in the document by whatever means.

Security thread A thin strip of plastic or other material embedded or partially embedded in the substrate during the paper manufacturing process. The strip may be metallized or partially de-metallized.

Tactile feature A surface feature giving a distinctive "feel" to the document.

Tagged ink Inks containing compounds that are not naturally occurring substances and which can be detected using special equipment.

Template/Reference template Data which represent the biometric measurement of an enrollee used by a biometric system for comparison against subsequently submitted biometric samples.

Template size The amount of computer memory taken up by the biometric data.

Thermochromic ink An ink which under-goes a reversible colour change when the printed image is exposed to heat (e.g. body heat).

Threshold A "benchmark" score above which the match between the stored biometric and the person is considered acceptable or below which it is considered unacceptable.

Token image A portrait of the holder of the MRP, typically a full frontal image, which has been adjusted in size to ensure a fixed distance between the eyes. It may also have been slightly rotated to ensure that an imaginary horizontal line drawn between the centres of the eyes is parallel to the top edge of the portrait rectangle if this has not been achieved when the original portrait was taken or captured (see Section 2, 13 in this volume of Doc. 9303, Part 1).

UV Ultraviolet light.

UV dull substrate A substrate that exhibits no visibly detectable fluorescence when illuminated with UV light.

Validation The process of demonstrating that the system under consideration meets in all respects the specification of that system.

Variable laser image A feature generated by laser engraving or laser perforation displaying changing information or images dependent upon the viewing angle.

Verification/Verify The process of comparing a submitted biometric sample against the biometric reference template of a single enrollee whose identity is being claimed, to determine whether it matches the enrollee's template. Contrast with "Identification."

Watermark A custom design, typically containing tonal gradation, formed in the paper or other substrate during its manufacture, created by the displacement of materials therein, and traditionally viewable by transmitted light.

Wavelet Scalar Quantization
A means of compressing data used particularly in relation to the storage of fingerprint images. ■

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