FACILITATION (FAL) DIVISION — TWELFTH SESSION

Cairo, Egypt, 22 March to 2 April 2004

Agenda Item 2: **Facilitation and security of travel documents and border control formalities**
2.2: **Biometrics**

**BIOMETRIC TECHNOLOGY IN MACHINE READABLE TRAVEL
DOCUMENTS - THE ICAO BLUEPRINT**

(Presented by the Secretariat)

1. **INTRODUCTION**

1.1   The deployment of biometric technology in passports and other travel documents, for purposes of machine-assisted identity confirmation, is one aspect of the ICAO strategy to improve border clearance processes with machine readable travel documents and associated technology. Moreover, ICAO Assembly resolution A32-18 (adopted in 1998 and updated in 2001) 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.

1.2   Passport integrity is a significant factor in the security of the global travel system, and confidence in the integrity of a State's travel documents on the part of border control authorities promotes facilitation of border control formalities. In ICAO, biometric identification is considered an important tool for States to use to strengthen the security of their documents and increase the level of that confidence. Through the work of the Technical Advisory Group on Machine Readable Travel Documents (TAG/MRTD), ICAO is currently developing detailed specifications for biometric-enabled, machine readable passports, visas and other official travel documents.

1.3   On 22 May 2003 the Air Transport Committee of the Council approved a four-part recommendation from the TAG/MRTD which subsequently became known as the ICAO "Blueprint". The recommendation entailed selection of *facial recognition* to be used worldwide for machine-assisted identity confirmation; use of a *contact-less integrated circuit* (IC) (chip), with a minimum capacity of 32K bytes of data, as the medium for storage of electronic data, including biometric(s), on a travel document; programming of the IC using the instructions set out in the specified *logical data structure* (LDS); and use of a modified *public key infrastructure* (PKI) scheme for the implementation of digital signatures to secure the electronic data against unauthorized alteration.

2.   PROGRESS OF ICAO WORK IN BIOMETRIC
   TECHNOLOGY APPLICATIONS

2.1   Research and development of specifications relevant to the incorporation of machine readable biometric data in travel documents has been in progress since 1997 in the TAG/MRTD. The work began with defining optional data storage technologies that might be included in an MRTD to expand its machine readable data capacity beyond that of the classic, mandatory Machine Readable Zone (MRZ) of 2 or 3 lines of OCR-B. With the objective of providing the capacity for machine assisted identity confirmation (with biometrics) specifications were drafted for the application of a bar code, magnetic stripe, optical memory, integrated circuit chip with contacts, and/or contact-less integrated circuit(s) to a TD-1 (wallet-size) card.

2.2   For paper-based documents such as passports and visas, options for expanding data storage to accommodate biometric data were initially confined to two-dimensional bar codes, and the fourth edition of Doc 9303, Part 1, *Machine Readable Passports*, published in 1999, included a specification for this option, along with detailed specifications and guidance material related to confirming identity of the rightful holder of the passport with machine assistance. Also in 1999 work was begun to develop what is now known as LDS to provide precise programming instructions in standardized sequence, compatible with the complete range of optional data storage technologies to ensure global interoperability in the interchange of the coded data while accommodating the diverse data needs of issuing States. The following year, recognizing advancements in chip technology, the TAG/MRTD began to study and work on applications of IC(s) beyond TD-1 size cards, to passports and visas.

2.3   During the same period the TAG/MRTD conducted an extensive study of the various biometric technologies in use today to discern and quantify their compatibility with the issuance and inspection processes relevant to MRTDs, in order to determine whether one or more technologies could/should be adopted as the international standard for application in MRTDs.

2.4   The structured assessment of the compatibility of biometric technologies sought to evaluate each currently available biometric technology from a comprehensive system requirements perspective. The study considered that a biometric technology must support both verification and identification, defined as follows:

> **Verification**   *confirming identity* by comparing identity details of the person claiming to be a specific living individual against details previously recorded on that individual.

> **Identification**   *determining possible identity* by comparing identity details of the presenting person against details previously recorded on a number of living individuals.

2.5   Verification and/or identification must be feasible in the various processes, including first issuance of an MRTD (as defined by the practices of the issuing State or organization), renewal of an existing MRTD, and inspection of the MRTD and the person holding it for purposes such as border control or airline check-in. In addition the group sought to quantify compatibility against the criteria of redundancy, global public perception, storage capacity requirements and performance. In this evaluation, face achieved the highest compatibility rating (greater than 85%) while finger(s) and eye(s) emerged with a second-level compatibility rating (near 65%).

3.   **ICAO BLUEPRINT ELEMENTS**

3.1   Thus the blueprint specifies the selection of facial recognition as the globally interoperable biometric technology for machine-assisted identity confirmation. A technical report explaining the technical and practical considerations in deploying biometric technologies in MRTDs lists the reasons for this choice. At the same time, the report acknowledges that States may elect to add fingerprint and/or iris recognition to supplement facial recognition to support machine-assisted verification and/or identification. The technical report specifies that the chosen biometric(s) be stored on the document as images rather than templates, in the interests of global interoperability.

3.2   The blueprint further specifies a high-capacity (minimum 32 kilobytes) contactless integrated circuit chip as the electronic data storage technology to be employed for the deployment of biometrics in MRTDs. Compressed images of one or more biometrics will require a high-capacity storage medium, and the contactless IC was chosen because of its use in paper documents has recently been demonstrated to be feasible. Moreover, contactless IC(s) technology is in the public domain, covered by ISO standards. The Fifth Edition of Doc 9303, Part 1 (2003) includes a specification for insertion of a contactless IC in a machine readable passport.

3.3   Technical reports elaborating on each of the four components of the blueprint have been prepared as precursors to formal specifications, and are available to administrations upon request, in CD-ROM format, as companions to Doc 9303 - *Machine Readable Travel Documents*, Part 1, Fifth Edition (2003) and Part 3, Second Edition (2002). These reports are working documents on which States can base their procurement of the requisite technologies to implement the blueprint.

3.3   In due course formal specifications based on the technical reports will be incorporated in Doc 9303 and eventually will be processed for adoption as updated ISO standards.

4.   **ACTION BY THE DIVISION**

4.1   The Division is invited to recommend adoption of the following new Standards and Recommended Practice in Chapter 3 of Annex 9:

>   3.9   **Recommended Practice.!** *Contracting States should incorporate biometric data in their machine readable passports, visas and other official travel documents, using one or more optional data storage technologies to supplement the machine readable zone, as specified in Doc 9303,* Machine Readable Travel Documents.

>   3.___   Contracting States choosing to incorporate biometric technology in their machine readable passports for purposes of identity confirmation shall use facial recognition as the primary biometric technology in the interests of global interoperability.

>   3.___   Contracting States wishing to supplement facial recognition with a secondary biometric technology in support of identity confirmation with MRTDs shall select fingerprint and/or iris recognition in the interests of global interoperability.

>   [*Note concerning compliance with ICAO policy on patented technology*]

>   3.___   Contracting States incorporating biometric data in their machine readable passports shall store the data as image(s) in a contactless integrated circuit, specified in ISO/IEC 14443, programmed according to the logical data structure as specified by ICAO.

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