



**TECHNICAL ADVISORY GROUP ON MACHINE READABLE
TRAVEL DOCUMENTS (TAG/MRTD)**

TWENTIETH MEETING

Montréal, 7 to 9 September 2011

Agenda Item 2: Activities of the NTWG

Agenda Item 2.4: 2010/11 ICAO Request for Information (RFI)

2010/11 ICAO REQUEST FOR INFORMATION (RFI)

(Presented by the NTWG)

1. INTRODUCTION

1.1 This paper is intended to provide a final report to the ICAO TAG/MRTD outlining key areas of interest from the ICAO NTWG Request for Information (RFI) presentations that took place from 6 June to 10 June 2011 at the Joint Research Centre of the European Commission in Ispra, Italy

2. BACKGROUND

2.1 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.

2.2 The TAG/MRTD, through its New Technologies Working Group (NTWG), has conducted a three year RFI initiative since the mid 1990s in order to keep abreast of new and improving technologies that will provide future benefits to or application in the MRTD Programme. Relevant information gathered during the RFI process is summarized and shared among the 190 ICAO Member States. ICAO also considers this information when international standards are developed.

2.3 The information sought overall relates to technologies that may be used in machine-readable passports, visas and card-based travel documents and focuses generally on the following areas:

- a) assessment of applicant eligibility;
- b) document security and production;

- c) linking documents to holders/bearers;
- d) providing reliable authentication of genuine documents; and
- e) facilitating secure and reliable transit of travellers through airports, seaports and other international border control points.

3. SUBMISSIONS FOR RFI 2010/11

3.1 An ICAO State Letter was issued to Contracting States, noting that the presentations would be of particular interest to States. There were 66 participants from 29 Member States who attended the RFI presentations.

3.2 The International publication of the RFI attracted ninety two proposals across the ten categories. The categories are given in paragraph 33 and the breakdown of submission is listed at Appendix A. Sixty three proposals (from twenty-nine of the forty-six vendors who responded) were short-listed by the evaluation panel.

3.3 The NTWG identified a specific range of interest areas for consideration which were divided into ten broad categories. These were:

- a) Travel Document Security Concepts;
- b) Machine Assisted Security Features;
- c) Photograph Security Concepts;
- d) eCommerce and Public Key Infrastructure(PKI);
- e) Emerging Encryption Techniques;
- f) Data Storage Media;
- g) Data Chip Partitioning and Security;
- h) Antennae;
- i) Self-Service Facilitation; and
- j) Identity Management.

3.4 A selection panel made up of NTWG Members ranked each submission and agreed on a shortlist. Proposals were reviewed against a variety of qualitative and quantitative factors, depending on the category, including such aspects as: cost, innovation and interoperability with current and future document issuance and border control processes. The panel gave particular consideration to the ICAO goals of facilitation, security, and global interoperability. Short-listed vendors were invited to make oral presentations at a special Government Members only meeting.

4. KEY FINDINGS

4.1 There was no revolutionary technology proposed during the RFI presentations. Rather, an evolution of products and technologies previously offered to the market was showcased. However, some vendors did show innovative thinking and solutions which may well develop into potential new options for addressing issues in the MRTD environment in the future.

4.2 There were many examples of security features available for MRTDs, as this is now a mature area which nevertheless shows innovative solutions. The majority of the offerings presented are not apriori globally interoperable, but provide useful solutions for national and/or bilateral deployment. Quite a number of interesting travel document security features was presented which will enable states to be compliant with ICAO's minimum secure requirements. A few vendors demonstrated interesting individualized/personalized security features for inclusion in MRTDs and a number of States expressed an interest in their potential for enhancing security.

4.3 There were a number of examples of highly sensitive security features for MRTDs which are observable to the naked eye, thus not requiring the invention of equipment to be used at the border to verify the security features. These features are especially useful at non-automated borders.

4.4 The need for vendors to propose globally interoperable solutions continues to be a key requirement for ICAO and this is something that states should emphasize with vendors whenever they are considering upgrading their MRTDs or systems.

4.5 For security purposes with regards to eMRTDs, States are now even more convinced that it is necessary to verify certificates in ePassports to make sure that the authenticity and the integrity of a chip's data content is given. The RFI showed that there are now more companies who have the expertise necessary to develop and operate complex Public Key Infrastructure (PKI) solutions and are capable of developing these services for issuing and receiving states.

4.6 There has been considerable progress in the development of machine assisted security features in MRTDs and the capability of readers and systems to enable the authentication of MRTDs.

4.7 The use of biometrics is now gradually being integrated into self-service facilitation approaches, which assist the implementation of automated border crossings or other fast processing alternatives. The availability of an ePassport and other e-documents is key to these implementations.

4.8 Advances on the subject of inlay technology were demonstrated, which could lead to improvements in durability and flexibility as well as new design approaches for ePassport construction, enabling more sophisticated security features in the layer structure of these document.

4.9 At the previous RFI, some promising security innovations making use of Radio Frequency Identification (RFID) technology available at borders were identified (e.g. displays and RFID powered security elements). The 2010/2011 RFI did not show any further improvements or more mature products in this area.

5. CONCLUSION

5.1 In the three years since the last RFI, there has been significant development in some of the technologies presented but most are at a level of maturity for implementation in MRTDs. Vendors

continue to develop their understanding of the MRTD environment with interoperability, security, facilitation and identification of individuals being an important focus for new initiatives.

5.2 Biometrics is now considered to be a key component of border control systems and for the identification of individuals. More flexible methods for reading these quickly and effectively have been developed, which should, in future, speed up these processes. Several of these products have already been implemented and more will be available in the future.

5.3 The majority of vendors were focused on the security of MRTDs itself. However, where there is very real potential for change is in the use of more sophisticated reading systems. There is a need for interoperable systems which will integrate technologies to provide the security and identification assurances, which should be the focus of those responsible for providing national MRTDs and those who use them for border management purposes.

5.4 The RFI process continues to provide ICAO with a valuable tool to assist in the development of standards. It provides states with an insight into the potential opportunities to implement new and improved technologies in their national programmes for machine-readable passports, visas and card-based travel documents which are used internationally for border control purposes. It reinforces the imperative for States to take account of standards and the need for global interoperability in making technology decisions. It also highlights the crucial role that standards play in achieving the goal of global interoperability.

5.5 In future, the ICAO RFI should be extended to a broader range of respondents outside of the traditional travel document industry in order to identify innovative technology currently used in other fields which may have the potential to be applied in the MRTD environment.

5.6 The opportunity for a considerable number of States to participate in the RFI presentations made it a worthwhile process both for the vendor community to learn from the MRTD community and the States to learn from the vendors and one another.

6. ACTION BY TAG/MRTD

6.1 The TAG/MRTD is invited to:

- a) note the content of the findings and conclusions of the ICAO NTWG RFI 2010/11 report.
- b) approve the continuation of the RFI programme and note that the next ICAO NTWG RFI initiative is scheduled for 2013/14.

Appendix A

Category	Requirement	Submissions Received	Submissions Short-listed
<p>Travel Document Security Concepts (including identity and residence permits, stick-in vignettes and stand alone cards).</p>	<p>Document security concepts, which at the point of document personalization and/or at the point of document manufacture, may be used to protect on-board data from alteration or simulation. This includes document security features, innovative data page materials, substrates, binding materials and adhesives, and security inks, among other approaches.</p>	<p>49</p>	<p>34</p>
<p>Machine Assisted Security Features</p>	<p>Machine verifiable security features that an issuing and/or inspection authority may use for its own purposes as an aid to the authentication of a travel document. RFI seeks information on three main categories of machine verifiable security features.</p> <ul style="list-style-type: none"> • Structure feature: A structure feature is a security feature containing some form of verifiable information based on the physical construction of the feature. • Substance feature: A substance feature involves the identification of a defined characteristic of a substance used in the construction of the feature. • Data feature: The visible image of the MRP data page may contain information which may be detected by a suitable device built into the reader. <p>The proposed solutions shall also take into account the possibilities of state-of-the art full page document scanners with RF capability. Proposals dealing with advance document databases using pattern recognition capabilities to detect fraudulent documents are also welcomed.</p>	<p>10</p>	<p>8</p>
<p>Photograph Security Concepts and Image Enhancement Technologies`</p>	<p>With the advent of high-resolution digital cameras, powerful personal computers and sophisticated photo-editing software, the manipulation of photos aiming at the creation of biometric look-alikes is becoming more common. This RFI seeks information on mathematical and computational algorithms that secure digital photos and aid in the detection of tampering in digital media. We are interested in techniques to differentiate between photographic and photorealistic images and methods to mitigate techniques used for the metamorphosis of one image to another.</p>	<p>1</p>	<p>1</p>

E-Commerce and PKI	<p>Electronic on-line systems that may be applied to secure Internet based passport and visa application processes.</p> <p>Secure communications for multilateral data-sharing.</p> <p>New and emerging PKI concepts.</p>	5	4
Emerging Encryption Techniques	Information on developing algorithms and reasoning techniques related to cryptography focused on data integrity and in particular Quantum technology.	5	4
Data Storage Media	Data storage media that can be utilized in conjunction with biometric and machine verification technologies and concepts. Technologies should be supported by data that demonstrate the effectiveness of such techniques.	2	1
Data Chip Partitioning and Security	Data Chip Partitioning and Security	3	1
Antennae	Receiver coils through which the chip communicates with the reader through an induction technology following ISO14443 specifications but presents options to the shape of the coils within ID1 parameters to allow for more flexibility in document design. Additionally, information is sought in regard to dual-interface capability.	6	4
Self-Service Facilitation	Technologies and processes suitable for automated self-identification at international borders and/or entitlement facilities that will enable either unattended border crossing or program enrolment using concepts of chip enabled passports.	9	6
Identity Management	<p>Products that can discern obvious and non-obvious relationships between data sets in multiple databases.</p> <p>Anonymous entity resolution to be used in data sharing arrangements.</p> <p>Pattern recognition for applicant and staff behaviours to assist in the identification of external and internal fraud.</p> <p>Tools and services to improve the security and integrity of breeder documents.</p>	2	0
	Total	92	63