



ICAO Regional Seminar Maputo 24th to 26th November 2010

ICAO MRTD & eMRTD
Standards & Specifications

Presenter

Malcolm Cuthbertson
De La Rue ID Systems
ISO

Agenda

- ☀ Role of ICAO
- ☀ Chicago Convention 1944
- ☀ Doc 9303
 - Part 1 MRPs
 - Part 2 Visas
 - Part 3 Travel cards

International standards



OSCE

Evolution of MRTD

- ☀ Annex 9 to the Chicago convention of 1944
- ☀ 1968 - ICAO start work on MRTD standards.
- ☀ 1980 – First edition of Doc 9303
- ☀ First MRP issued in 1981
- ☀ Standards evolved over nearly 3 decades
- ☀ Balance between facilitation and security
- ☀ Cultural considerations:
 - Transliteration
 - Flexibility in VIZ
- ☀ First introduction of ePassport 2004

Chapter 3. of Annex 9

✿ Contracting States:

- Shall not extend the validity of their MRTDs
- Shall issue a separate passport to each person, regardless of age
- Validity. At least 5 years. Not more than 10 yrs
- Shall begin issuing only MRPs no later than 1 April 2010
- Shall make provision for encoded data to be revealed to the holder of the document
- Non MR passports issued after 24 Nov 2005 shall ensure that the expiration date falls before 24 Nov 2015. After 2015 all passports in circulation must be MRP

ICAO standards

☀ ICAO DOCUMENT 9303 (Parts 1-3), Family of MRTDs:

➤ Part 1: Machine Readable Passports (MRPs)

☀ Volumes 1 & 2

➤ Part 2: Machine Readable Visas (MRVs)

➤ Part 3: Official Travel Documents (cards)

☀ Volumes 1 & 2

☀ SUPPLEMENT 8

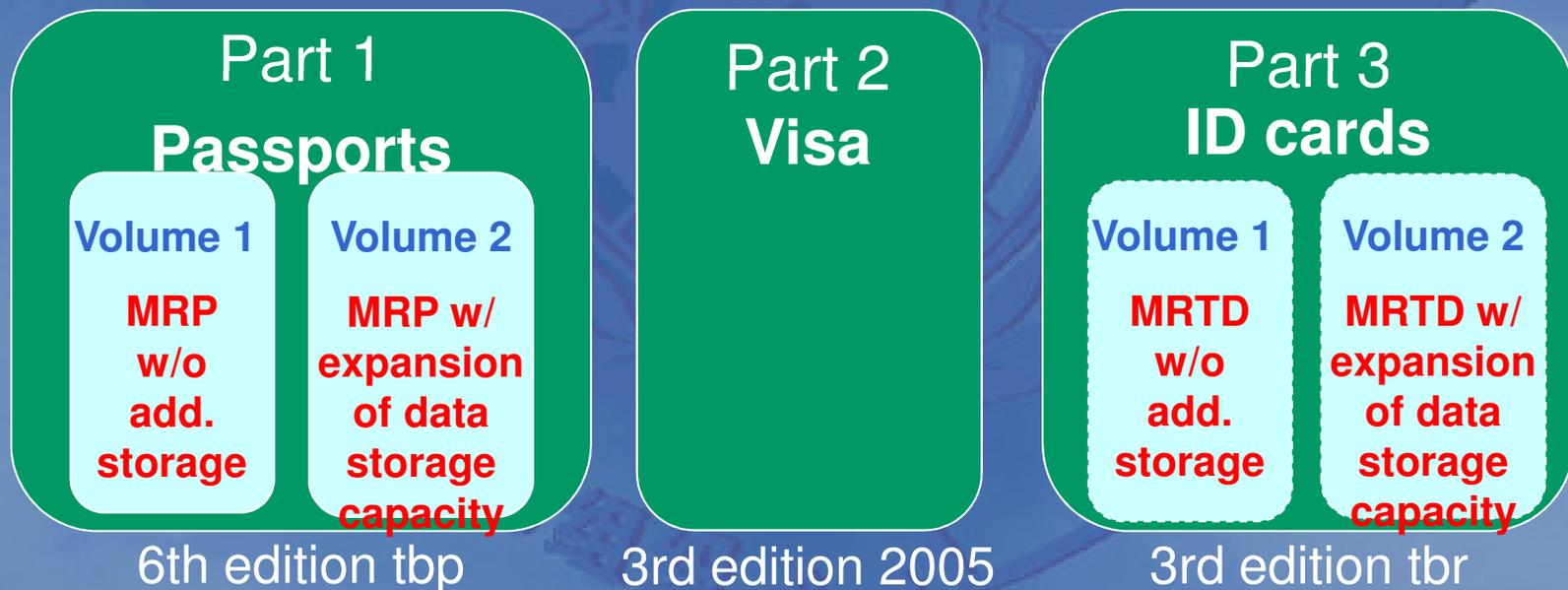
Intended benefits of MRTDs

- ☀ To facilitate and secure passenger processing at border control points
- ☀ To enable global interoperability

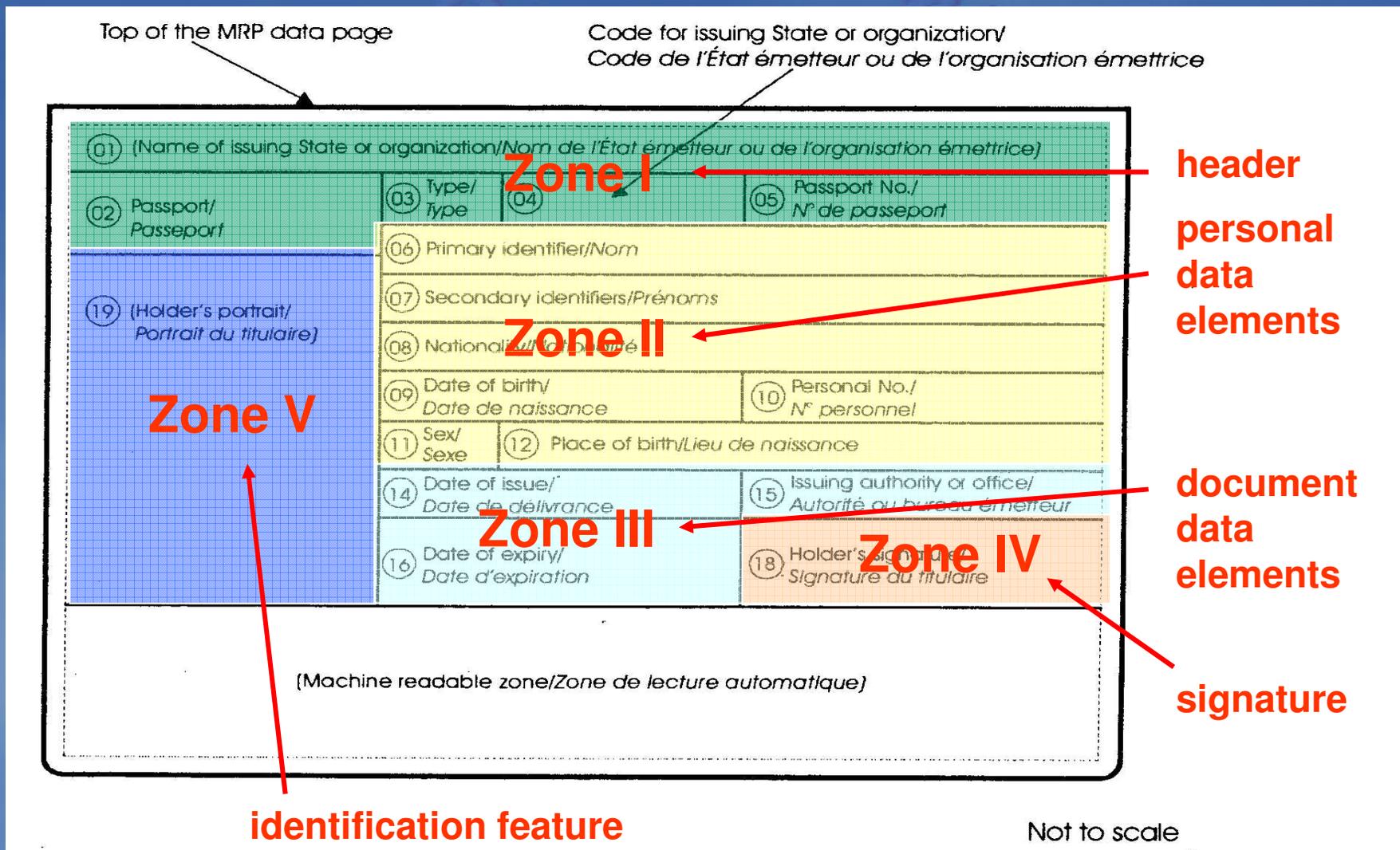


ICAO 9303 – status

- ☀ Structure of Document
- ☀ Supplements (8)



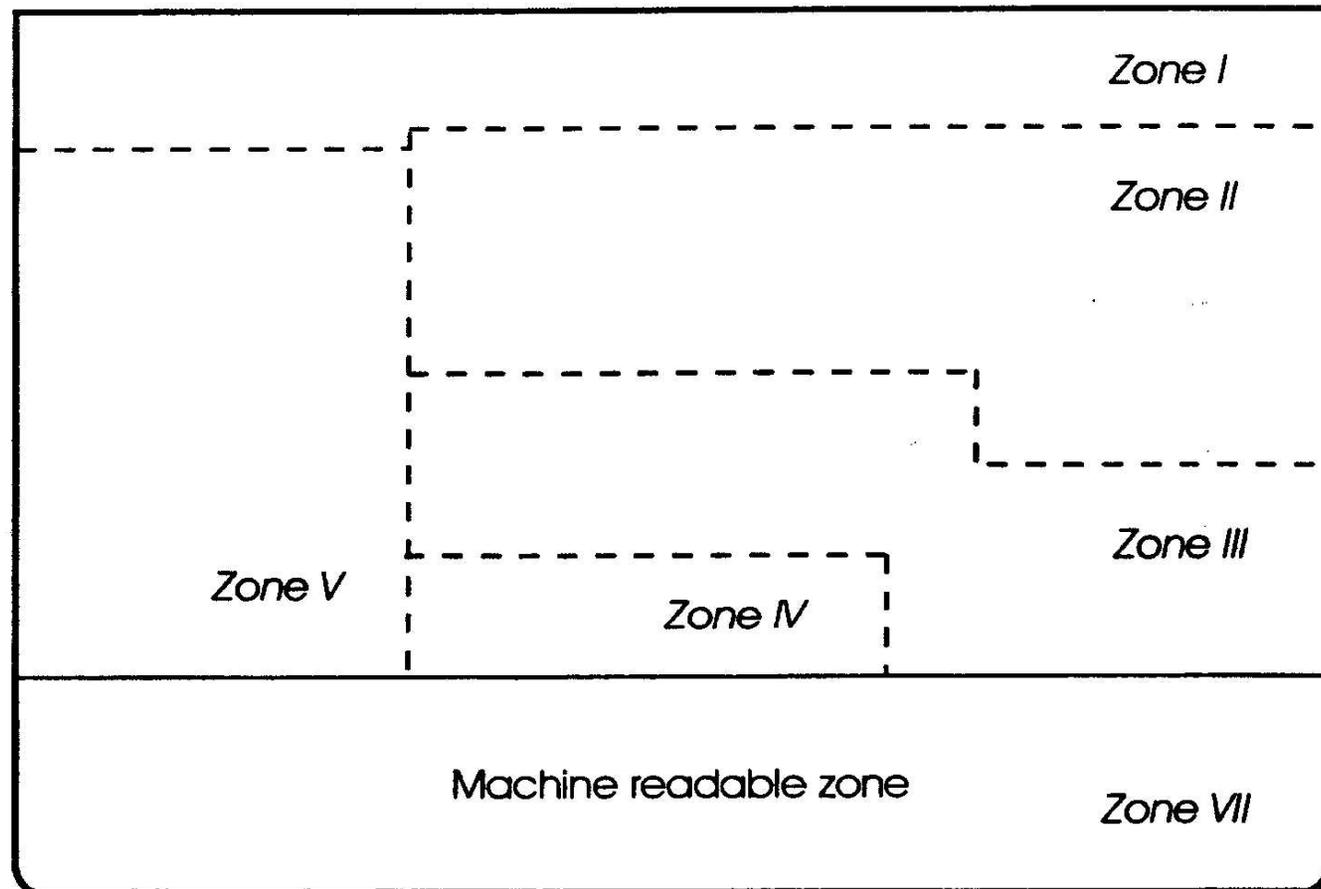
Visual inspection zone (VIZ)



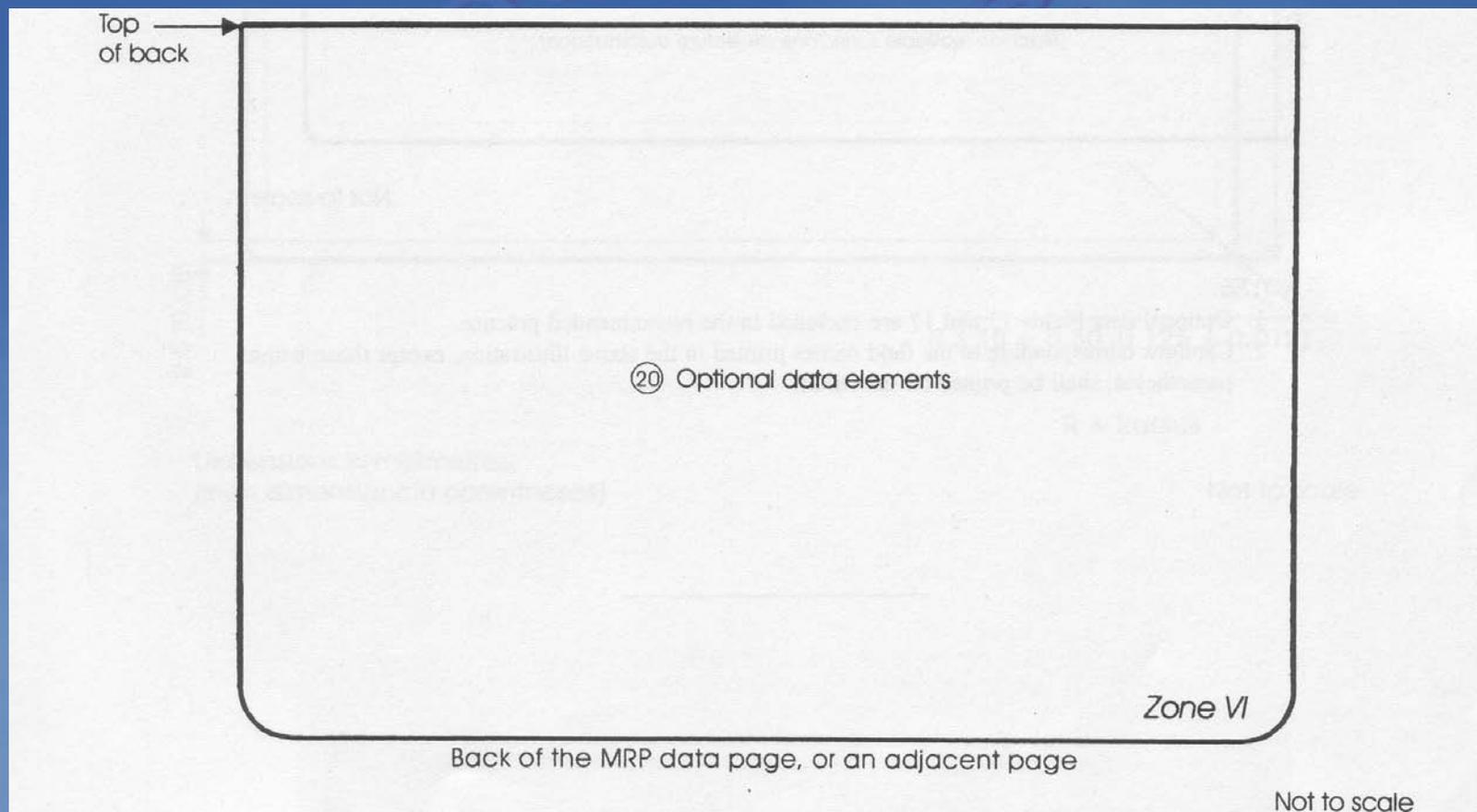
VIZ – zone location options

Diagram 2. Flexible positioning of Zones 1 to V

Example 1



VIZ – zone VI

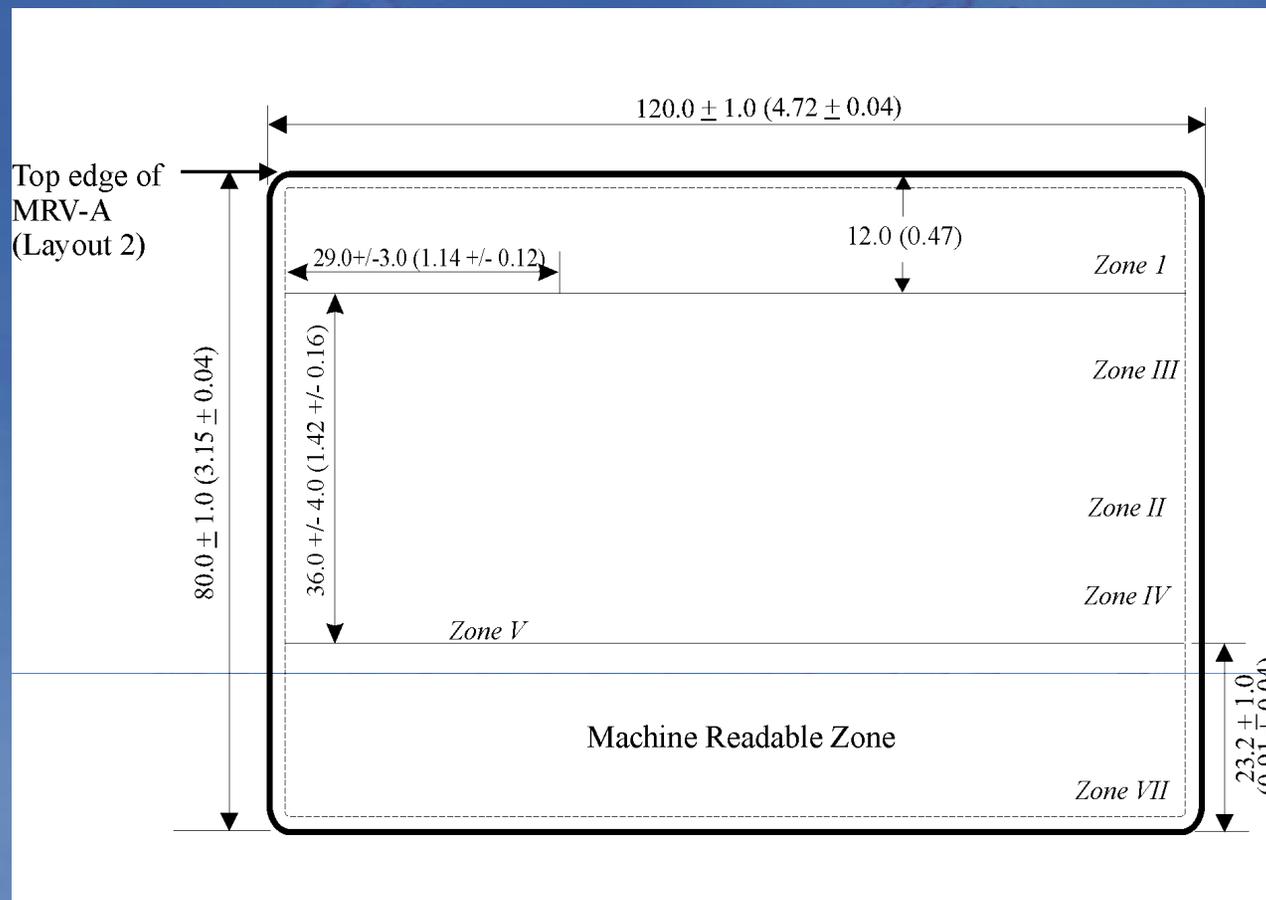


Visas

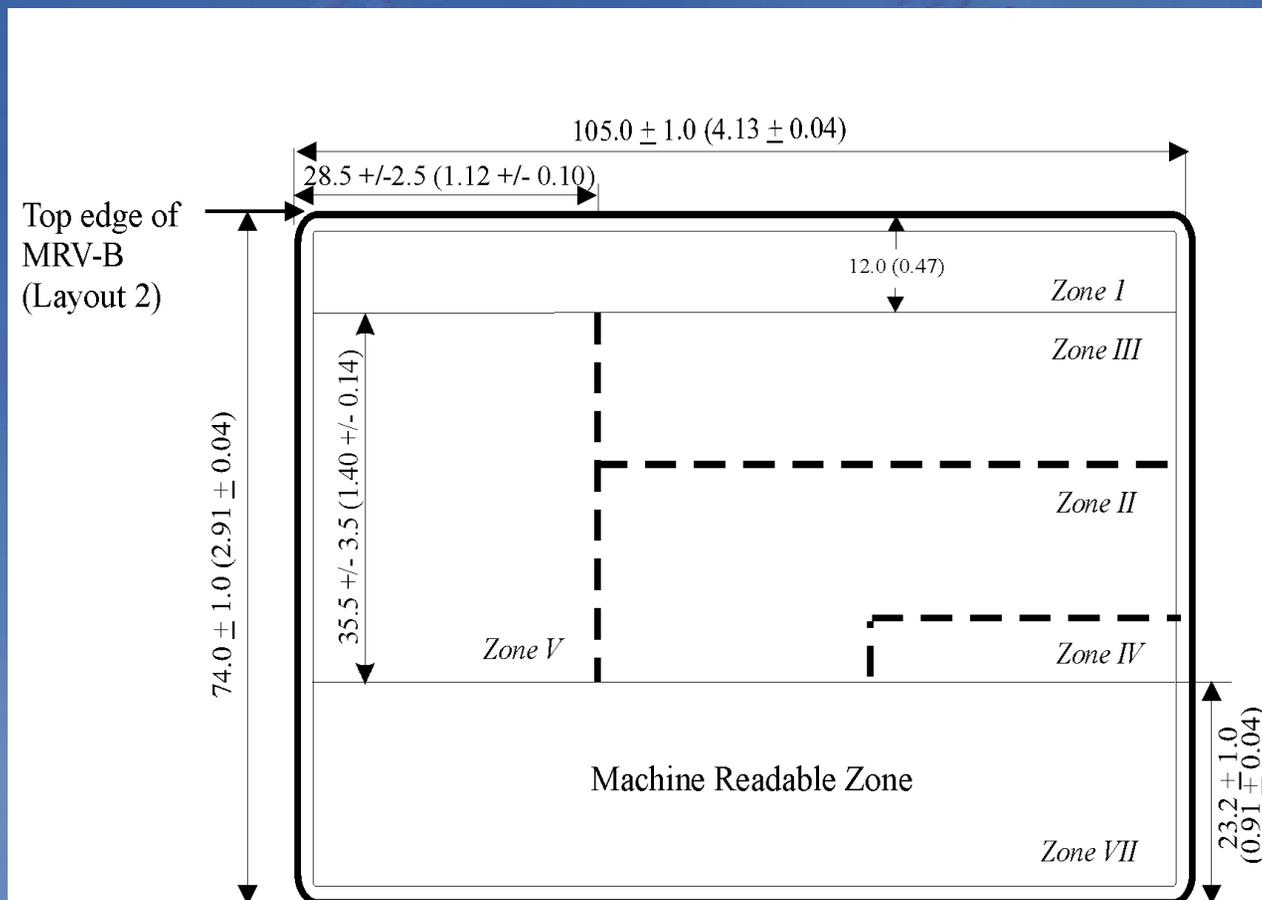
Why interoperability?

- ☀ International travel
- ☀ Border control – 190 member states
- ☀ Airlines – carriers' liability act
- ☀ Banks

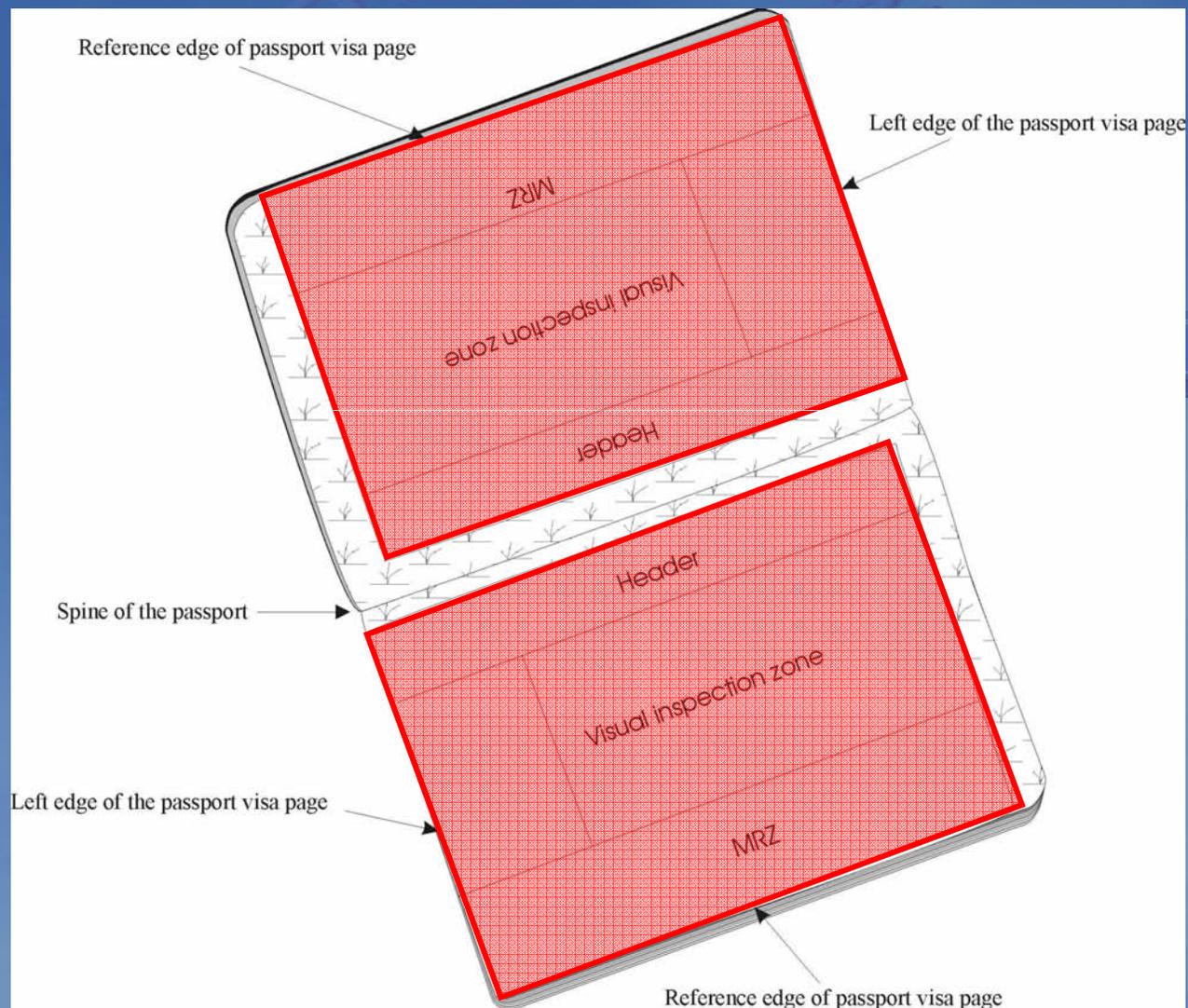
Zone boundaries: MRV-A



Zone boundaries: MRV-B



Visa positioning in passport



Part 3 – Official Travel Documents (cards)

- ✿ Interoperability needed
- ✿ National ID card used for travel
- ✿ Standards as for ePassports
- ✿ Part 3 currently under revision in TAG/MRTD secretariat, DCFWG finished work

Current 9303 Part 3

☀ Options for expansion of machine-readable data storage:

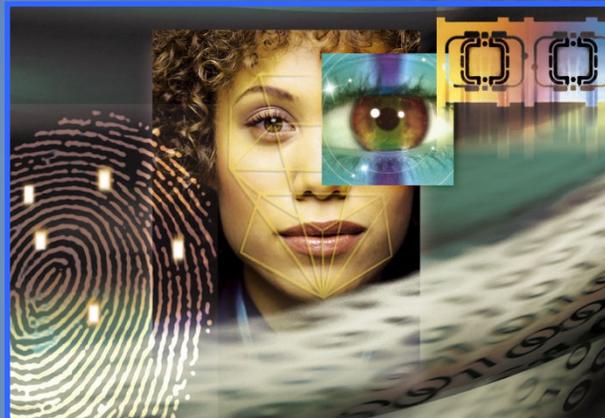
- Bar codes
- Magnetic stripes
- Integrated circuit with contacts
- Contactless integrated circuits
- Optical memory

Third Edition 9303 Part 3:

☀ Options for expansion of machine-readable data storage:

- ~~Bar codes~~
- ~~Magnetic stripes~~
- ~~Integrated circuit with contacts~~
- Contactless integrated circuits
- ~~Optical memory~~

eMRTD ICAO Blueprint



- ☀ Facial image
- Finger Print
- Iris
- ☀ RF Chip (min 32K)
- ☀ LDS
- ☀ PKI

Planning for Introduction of ePassports

- ☀ Central or decentralised issuing
- ☀ Personalisation technology – location of chip
- ☀ Embassy issue - repatriation
- ☀ Emergency issue - ETDs
- ☀ Validity of ePassports – 5 or 10 years
- ☀ Image capture - Live
- ☀ Second biometric - EU
- ☀ Waste levels – cost
- ☀ Level of security

E MRP Readers



Machine Assisted Document Security Verification

ICAO NTWG paper on subject

✿ A structure feature

- hologram or DOVID

✿ A substance feature

- Inks / fibres etc

✿ A data feature

- Digital security - Steganography

MRP Summary

- ☀ 182 out of 190 countries issuing MRPs
- ☀ 8 countries still not issuing MRPs
- ☀ Nearly all of these countries have tenders or contracts in place
- ☀ ICAO requirement for all countries to issue MRPs by 1st April 2010
- ☀ No non MRPs after 2015

ePassport Summary 2010

- ☀ Over 70 countries issuing ePassports out of 190
 - 100+ By End of 2011
- ☀ 75 million ePassports issued each year out of a total of 120 million
- ☀ 21 countries have now joined the PKD
- ☀ **No ICAO requirement for countries to issue ePassports**

Security features

- ☀ Security must be multi-layer and the most important are the level 1 features
- ☀ The security features need to protect the holder's photograph
- ☀ Important not to obstruct the MRZ
- ☀ ePassports & biometrics just another security feature

Data page – under pressure

- ☀ The page with all the personal data and the most examined page
- ☀ It must provide protection against counterfeit and fraud, especially from desktop publishing



Data page – importance

- ☀ Data page is the most important page in a passport
 - the most examined
 - contains all the personal data
 - requires the most protection against counterfeit and fraudulent alteration

Elements



eMRTDs

☀ I will now hand over to Robin Chalmers

EMRTD Key Elements

- ✱ Chip
- ✱ Logical Data Structure (LDS)
- ✱ Data Security
- ✱ Public Key Infrastructure

Chip

- ☀ Reliability
- ☀ Location
- ☀ Size

Logical Data Structure

- ☀ Electronic representation of data page
- ☀ Data groups
- ☀ Future version of LDS?

Data Security

- ☀ Privacy concerns
- ☀ Skimming
- ☀ Eavesdropping
- ☀ Cloning
- ☀ Security measures

Public Key Infrastructure

- ☀ A means of establishing data is genuine
- ☀ Private and Public Keys
- ☀ Public Key Directory

Conclusion

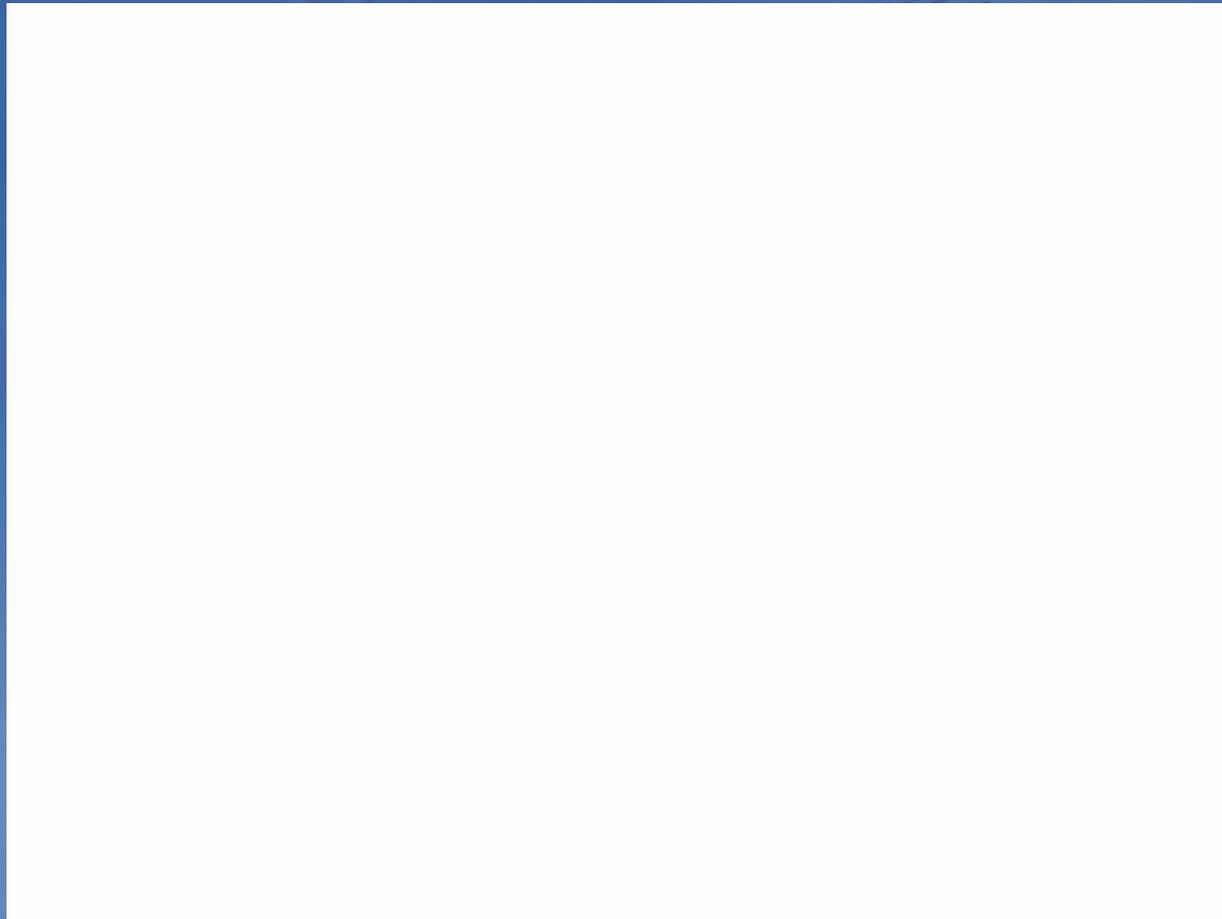
- ✿ MRTD specifications have endured
- ✿ VIZ/MRZ remain as originally envisaged
- ✿ eMRTD is a significant step forward in travel document security

Thank You!

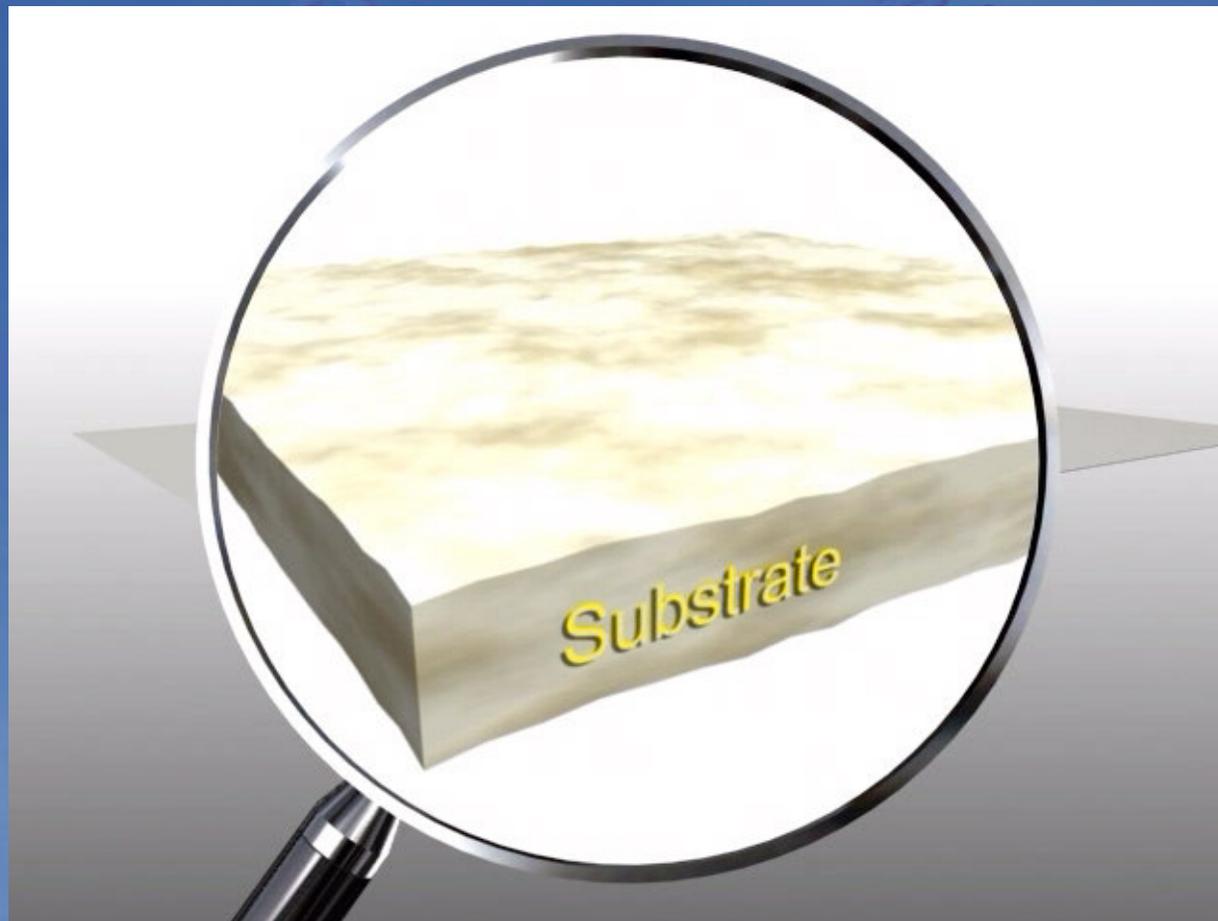
Malcolm Cuthbertson:

Robin Chalmers: pillhiltiscali.co.uk

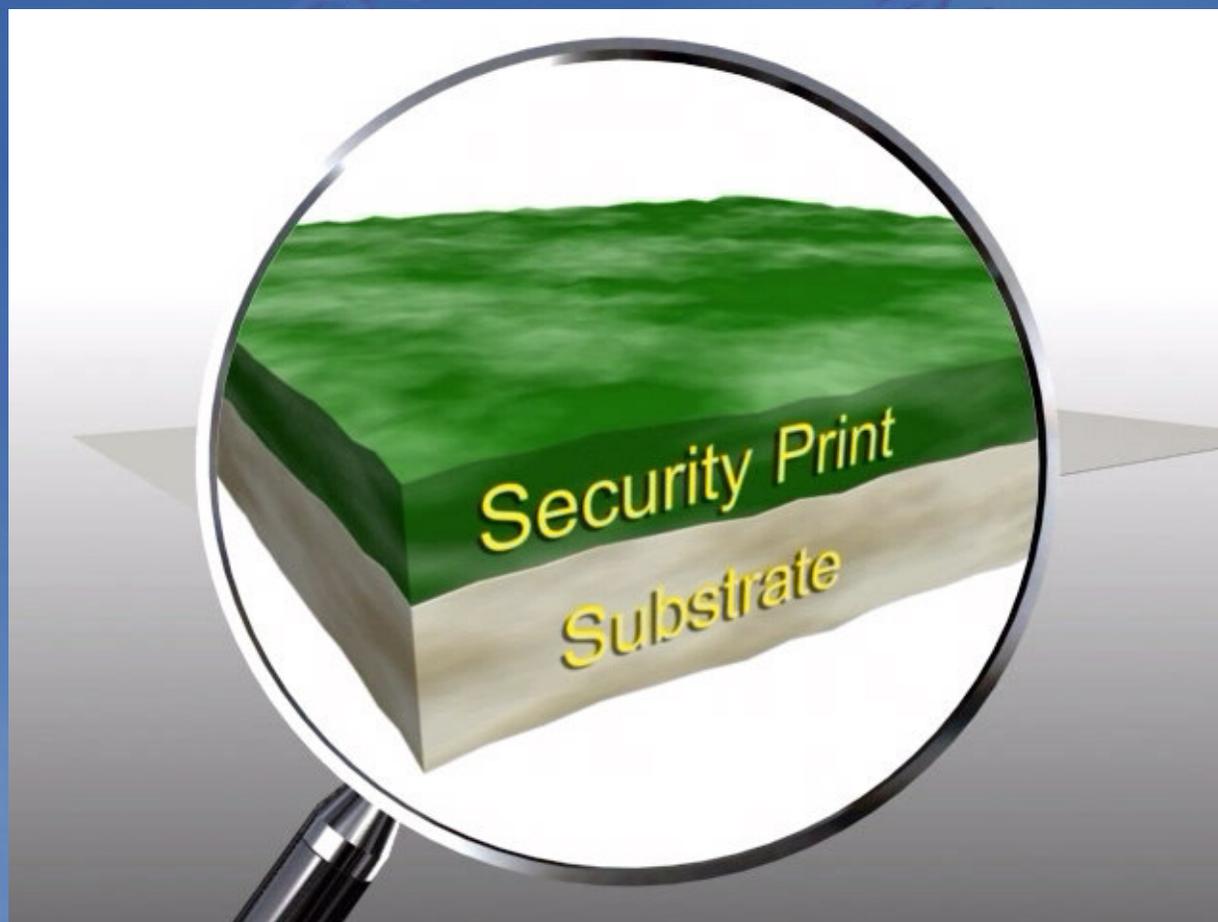
Page layout & picture outline



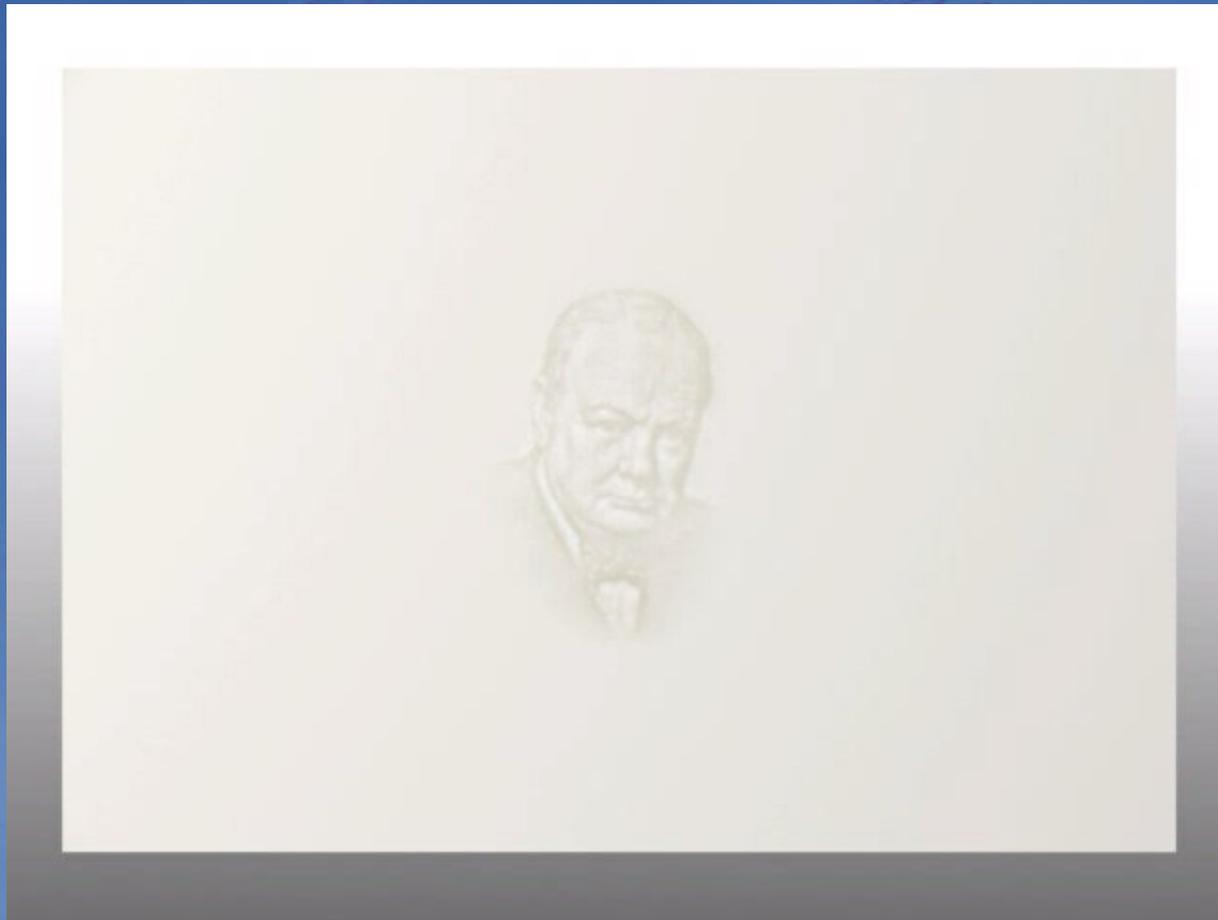
Elements



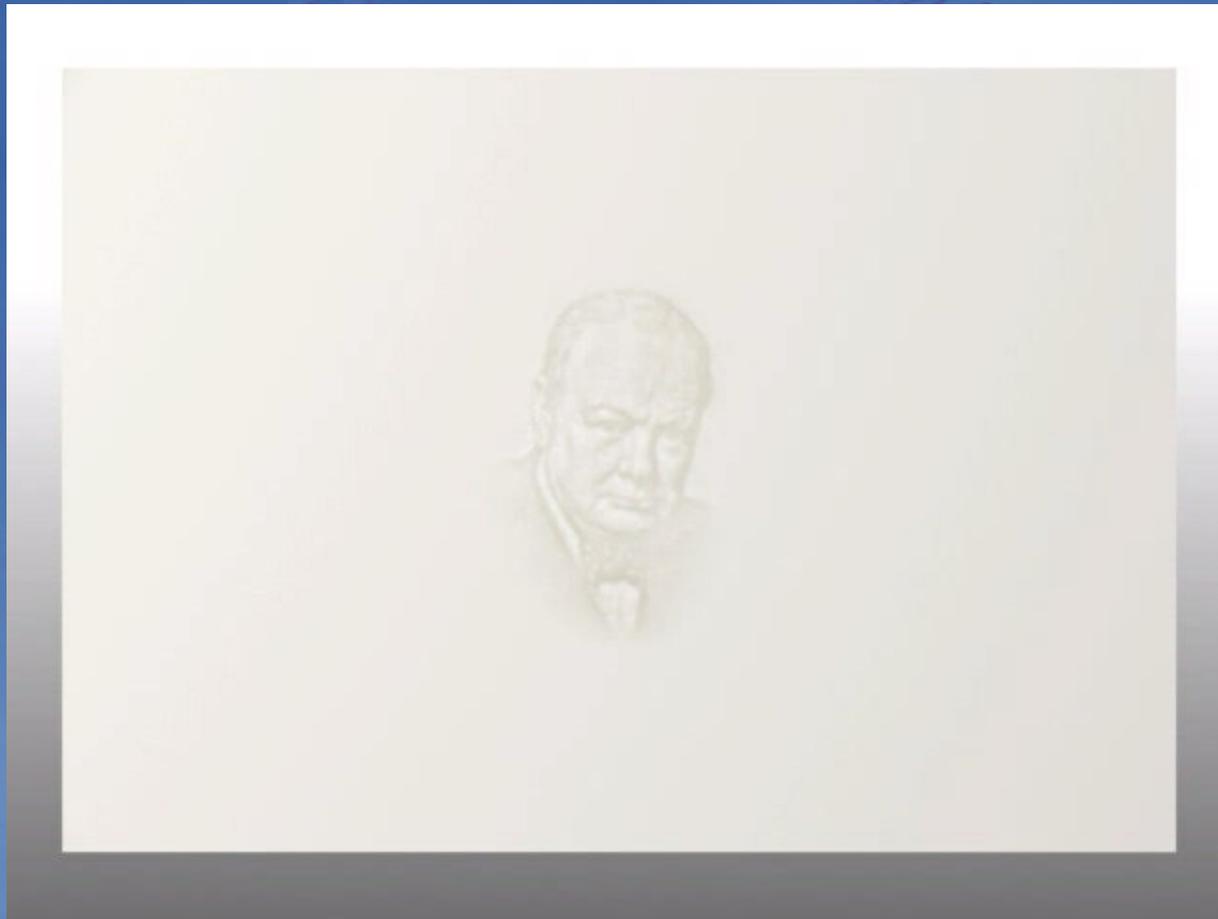
Elements



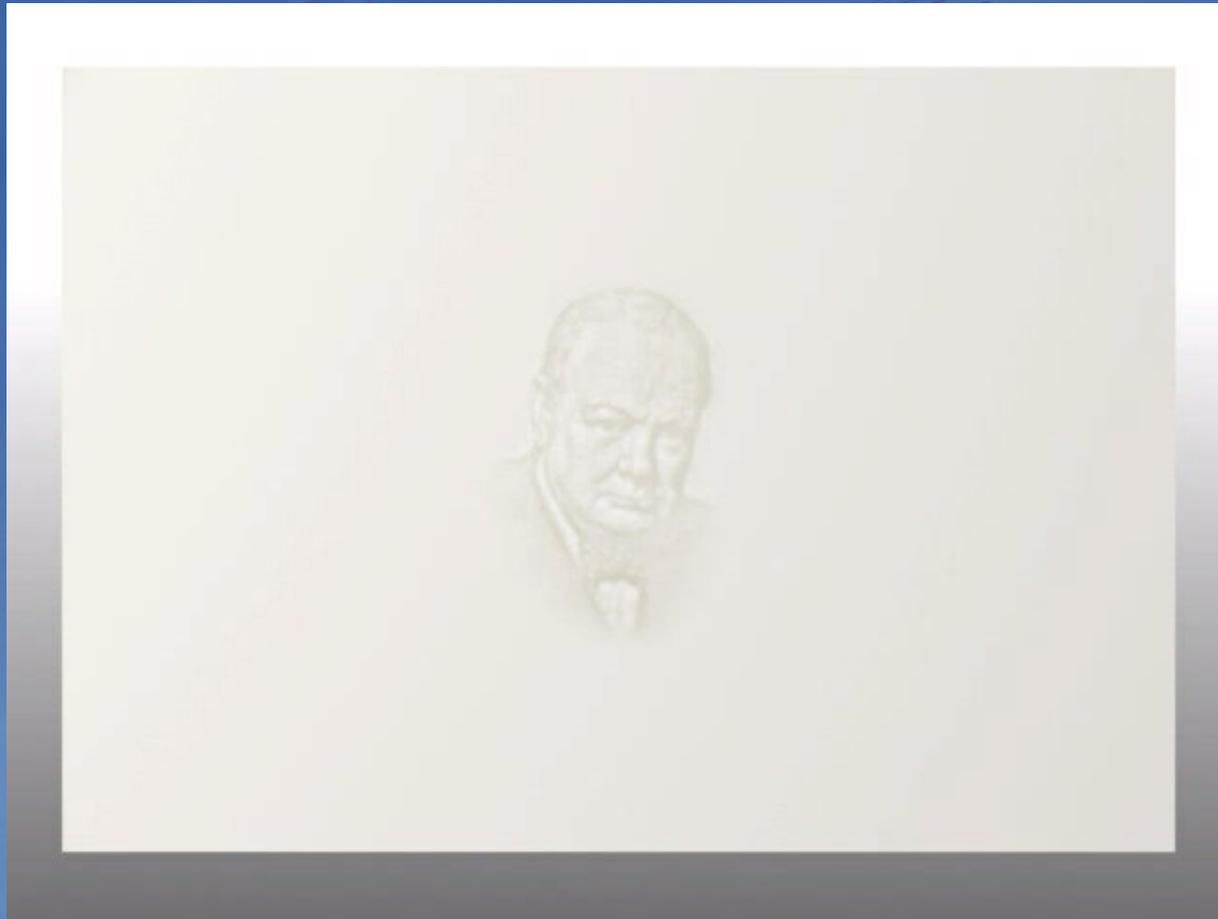
Paper substrate: UV dull



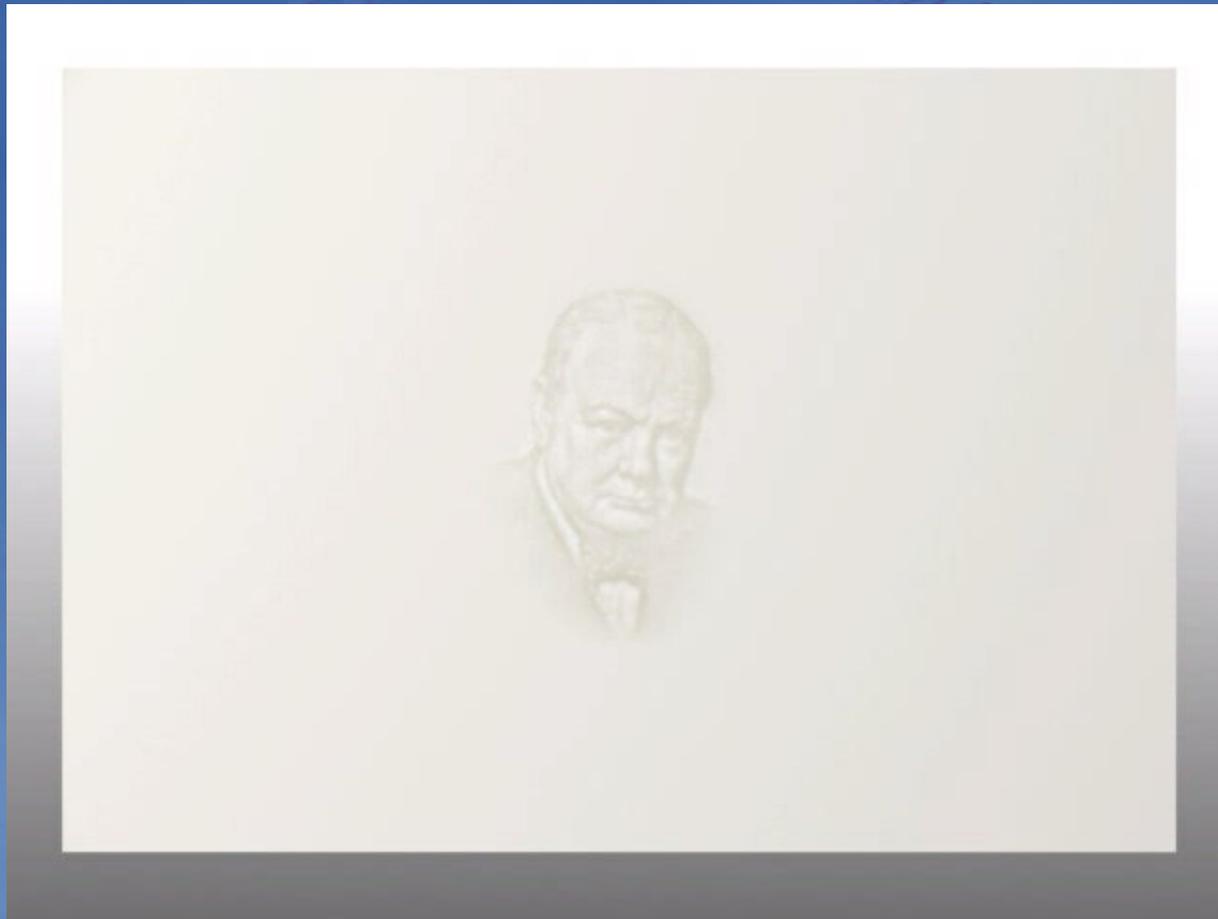
Chemical sensitisation



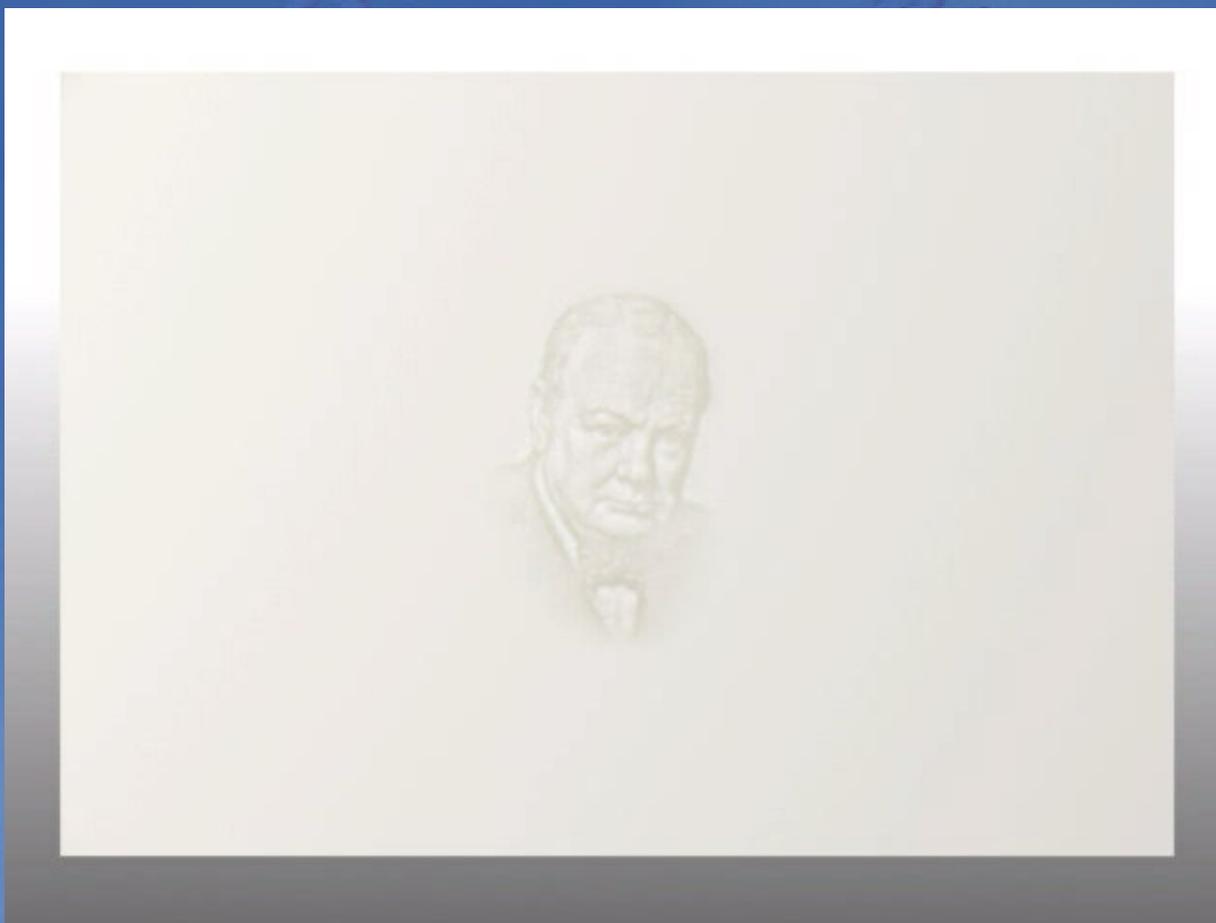
Cylinder mould watermark



Fibres & planchettes



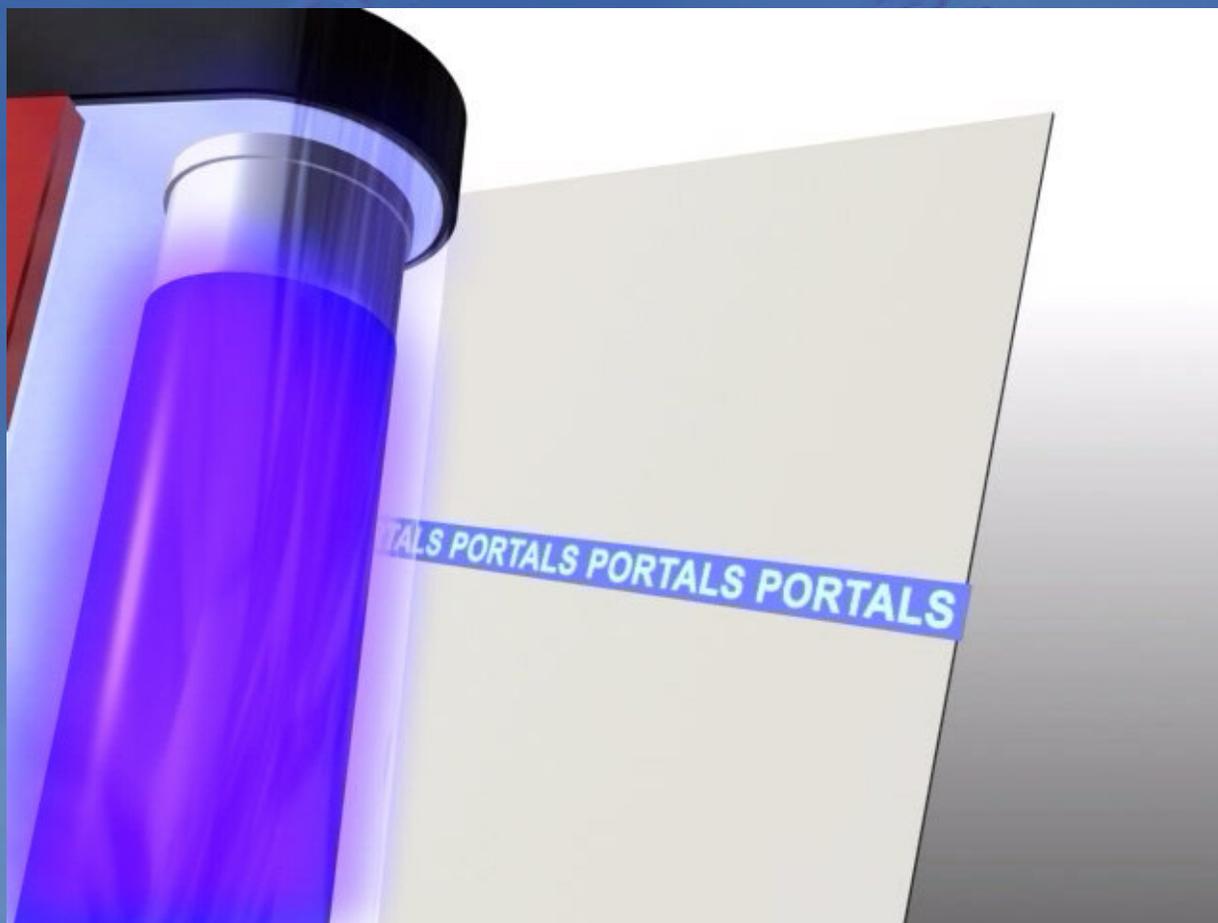
Thread



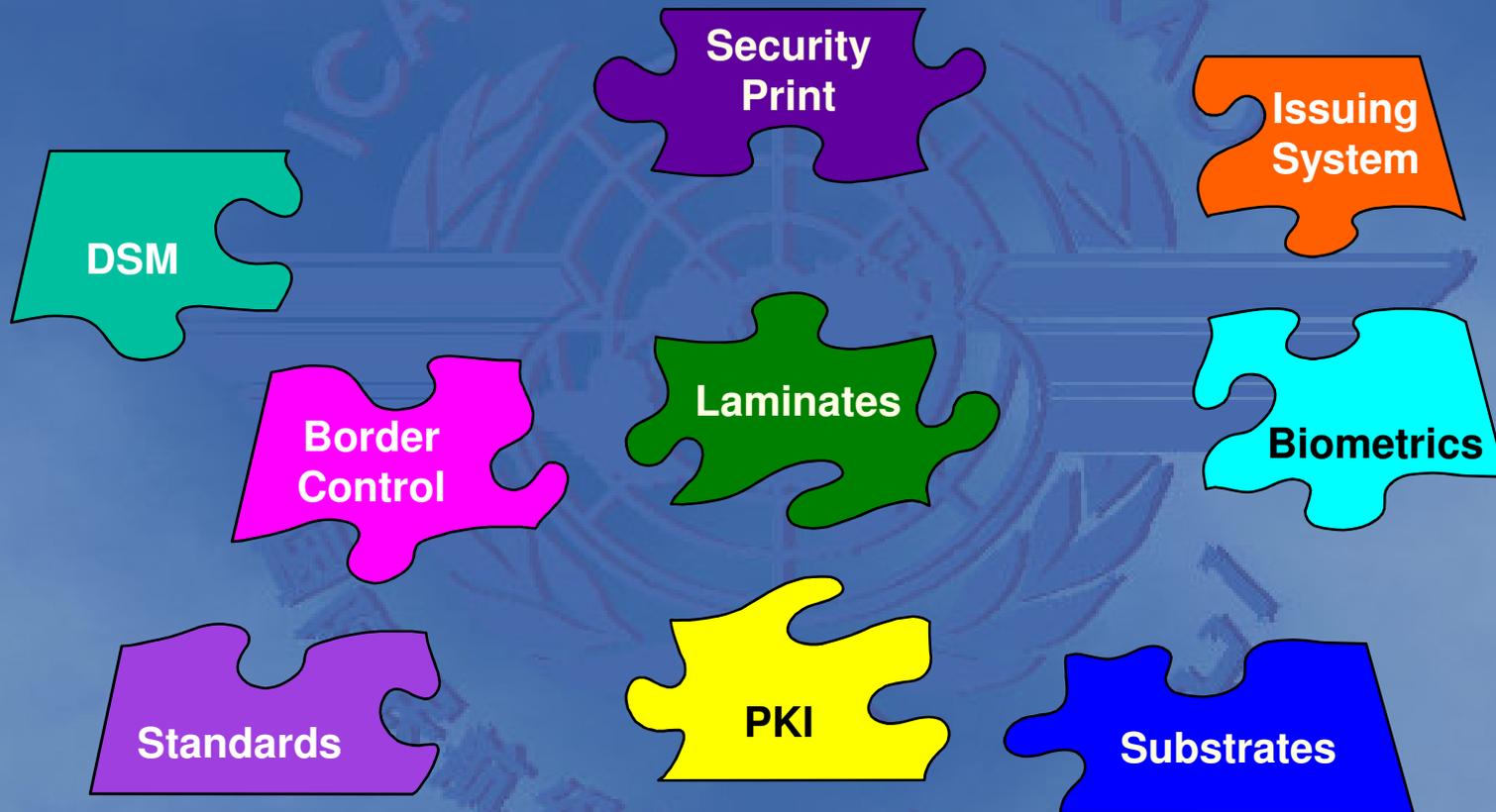
Thread



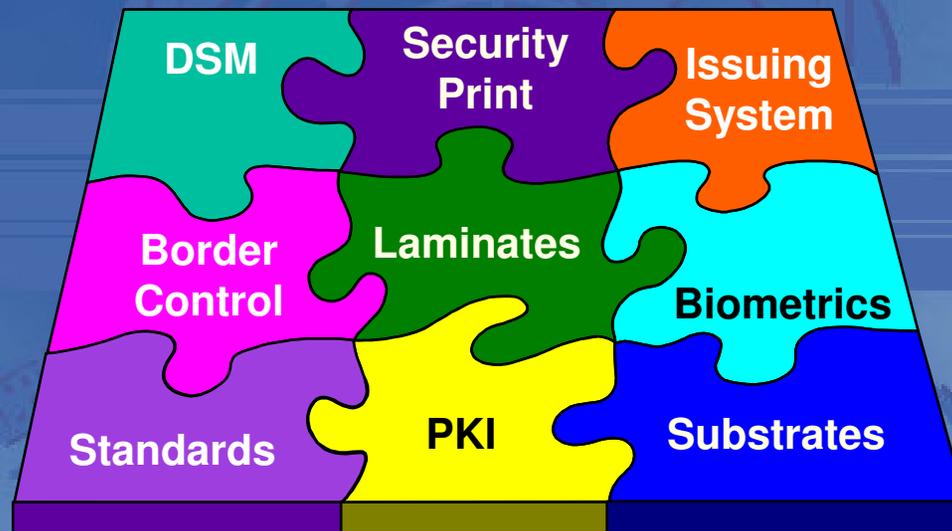
Thread



All component parts must be mutually supporting



The solution is normally a compromise



☀ Thank you for your attention

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What is a MRP?

☀ Machine readable passport (MRP):

“Passport conforming with the specifications contained in Doc 9303, Part I. Normally constructed as an ID-3 size book [...].”

ICAO Doc 9303, II-2

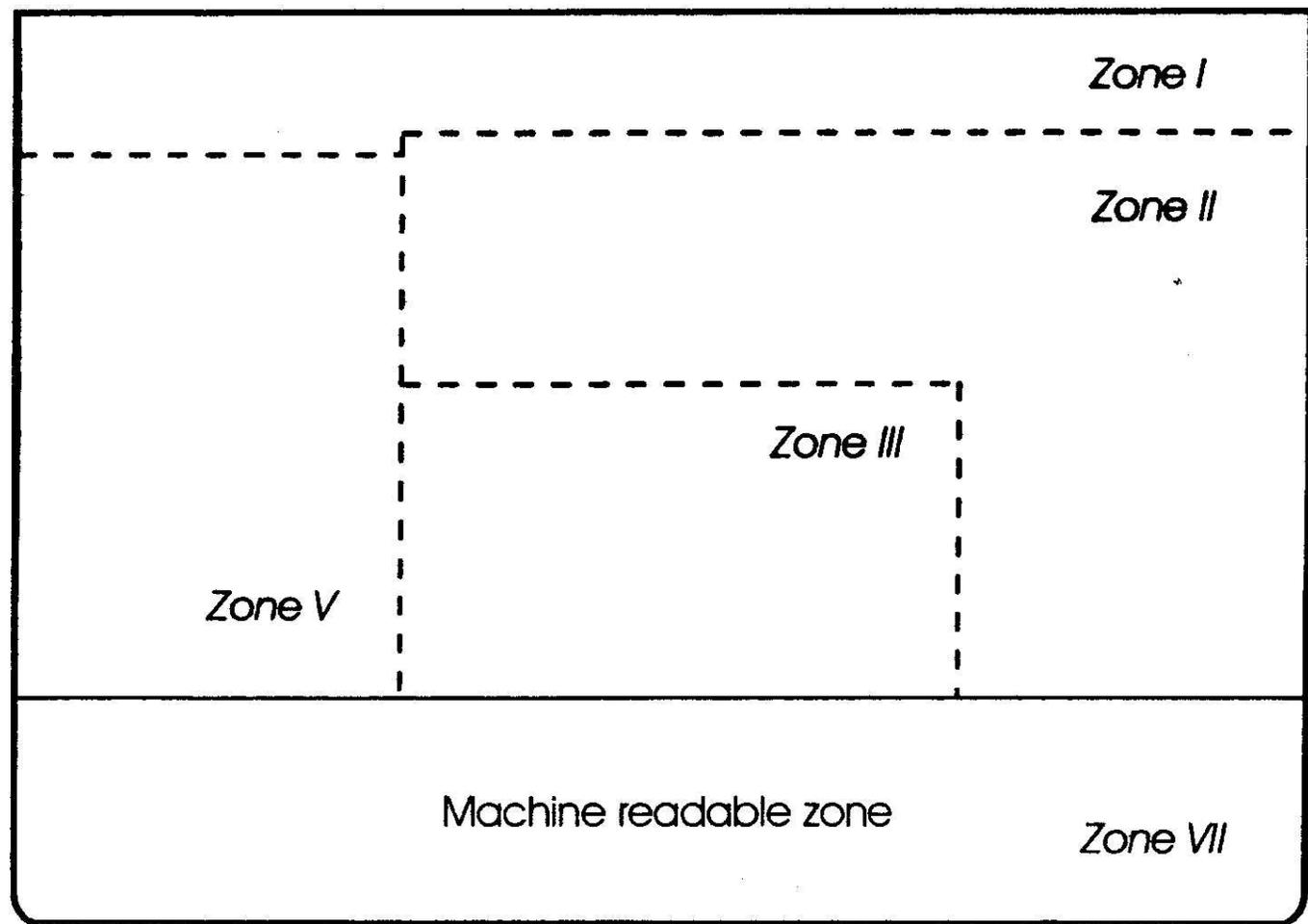
What is a MRTD?

☀ Machine readable travel document (MRTD):

“Official document issued by a State or organisation which is used by the holder for international travel and which contains mandatory visual (eye readable) data and a separate mandatory data summary in a format which is capable of being read by machine.” ICAO Doc 9303, II-2

VIZ – zone location options

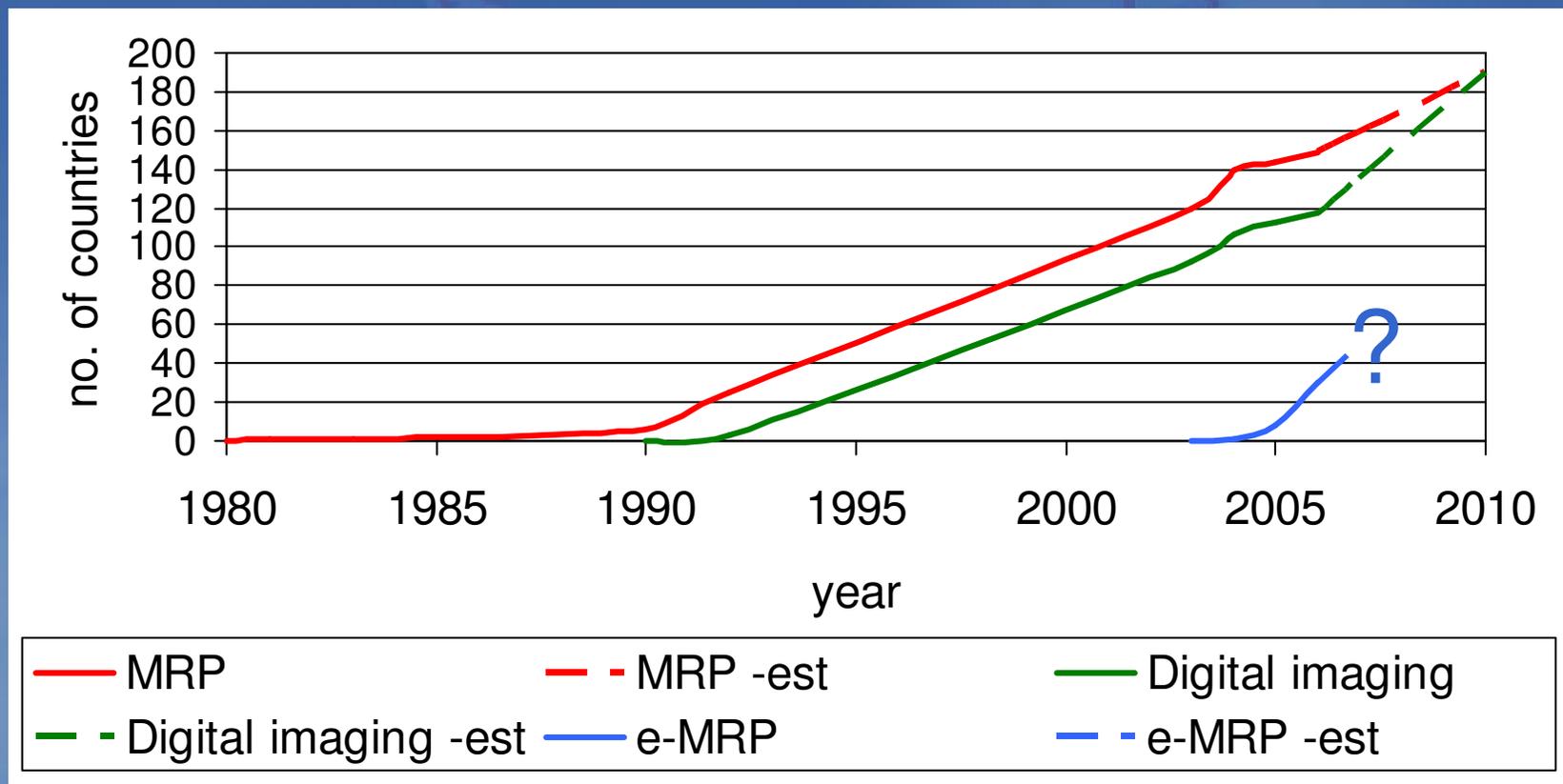
Example 2



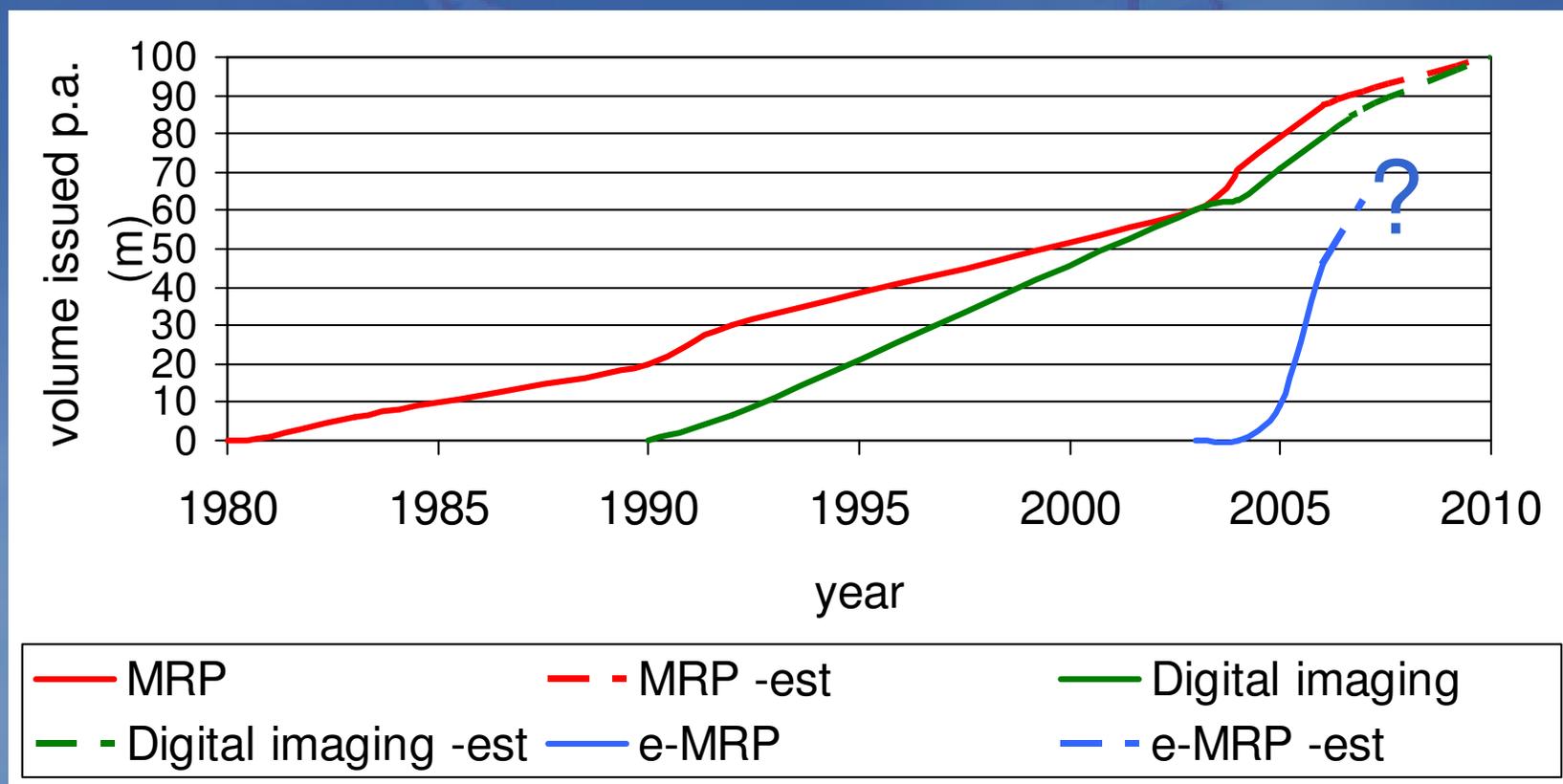
ICAO Doc 9303 Parts 1-3 interoperability

- ☀ Cultural considerations
 - Flexibility in VIZ
 - Truncation
 - Transliteration
- ☀ Reader standards – OCR & “e”
- ☀ Document specs; security features

Growth (no. of countries)



Growth (volume issued p.a.(m))

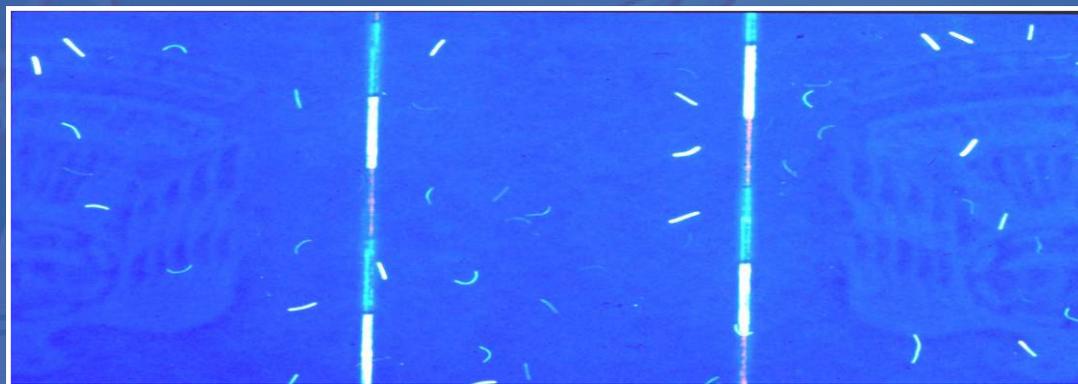


900m MRTDs in circulation worldwide

Substance Feature

☀️ OVI

☀️ Fibres



MRTD interoperability

- ✿ Standards evolved over nearly 3 decades
- ✿ Balance between facilitation and security
- ✿ Interoperability includes:
 - ISO standards (7501)
 - Eye readable data
 - MR data – OCR B
 - ePassports
 - ✿ Biometrics
 - ✿ DSM
 - ✿ LDS/PKI

Facilitation and security

- ☀ Opposing requirements?
- ☀ 9303 recommendations on:
 - Passport security features
 - Security of issuing process