E-Passport Mock Port of Entry Test

November 29 thru December 2, 2004

Operational Impact on the Inspection Process

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Mock POE Purpose

- *The primary goal of this Mock Port of Entry (POE) test was to determine the operational impact of using new equipment capable of reading e-passports on the primary inspection process.*

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Participating Nations

- United States
- Belgium
- Finland
- Sweden
- Essen Group (Germany, Netherlands, U.K.)
- Italy
- France
- Japan
- Singapore
- Australia
- New Zealand
- Canada
- Brunei
- Austria (provided sample passports only)

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Test Documents

- Sample Passports provided by manufacturers
  using consistent data for 13 test subjects (from nation of 'Utopia').
- National representatives with sample passports with their own data
  - United States
  - Australia
  - New Zealand
  - Sweden
  - France
  - Italy
  - Germany
  - Belgium
  - Japan
- Legacy travel documents used by test volunteers
  - Passports (multiple Nations)
  - Other US-issued Travel documents

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Technology Alternatives – Imaging

- Fixed camera triggered by inspector with facial matching algorithms comparing against data retrieved from chip
- Continuous video with facial matching algorithms comparing against data retrieved from chip
- Facial capture device operated by traveler to capture full frontal image
- Continuous video capturing 4 best images, performing facial image comparison against them

Note: The Mock POE test was not conceived as a formal biometric test. Accordingly the face camera providers were not asked to supply a face recognition capability. Although one elected to do so, the relevant goal of the session was to determine if images could be effectively collected that would be sufficient to allow good matching.

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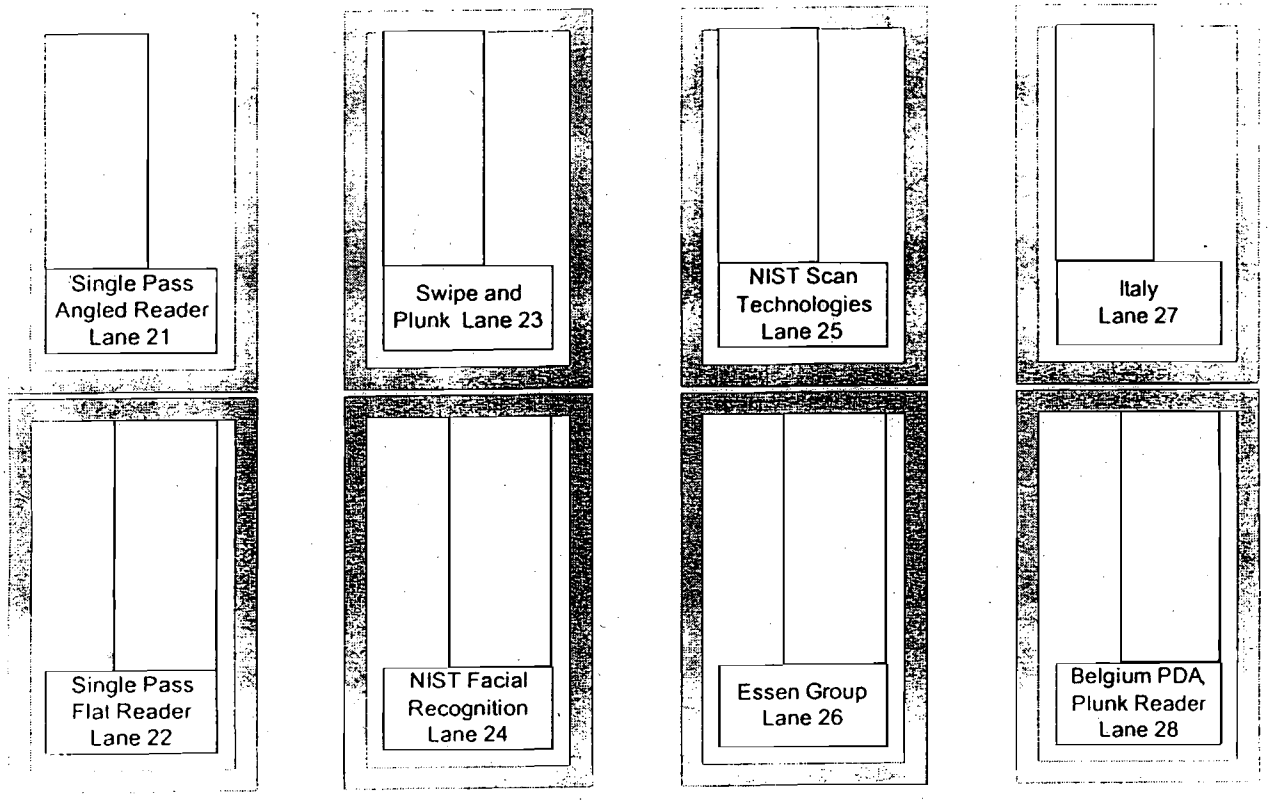
Technology by Lane



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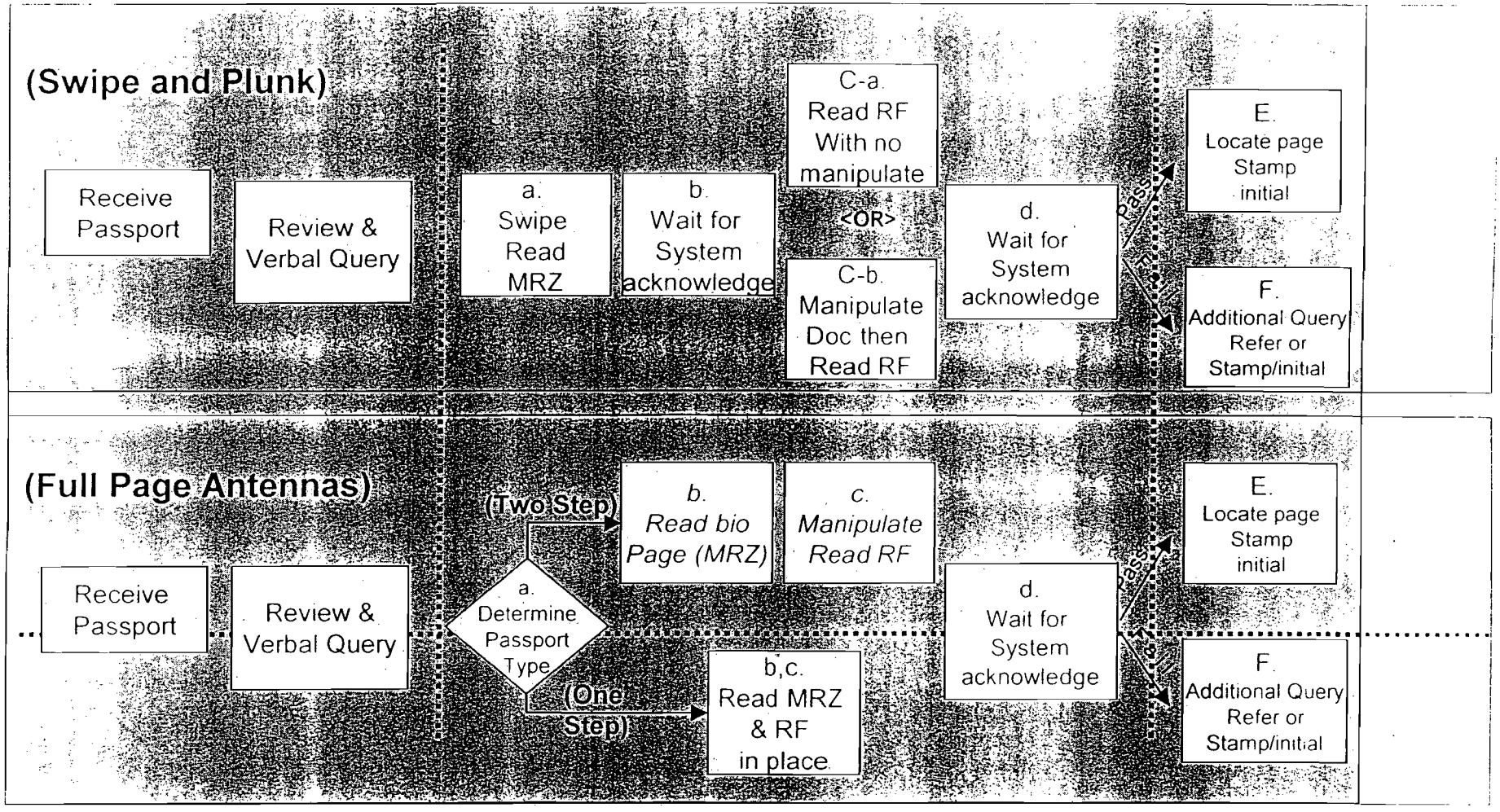
Process



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Insight

If technology does not enhance or improve the existing process flow, new reader technology solutions will not be well received by the POE officer/inspector community.

Any solution implemented needs to be better than or equal to the current process, with minimal impact on the inspector.

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Major Findings

- Insufficient power to read all variations of chips on many readers
- Inability to properly handle different chips read rates (424/848)
- Lack of use of digital signature verification in systems and only partial implementation of alternatives in others
- Most units required knowledge of where chip was in order to perform accurate read, required substantial manipulation of the passport.

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Major Findings

- Readers require too much attention and time on the part of the inspector.
- Instructions on the reader distract the inspector, e.g. electronic displays.
- Lack of proper feedback to the inspector on WHEN to remove the passport.
- Footprint of the units interferes with inspector operations.
- Some readers required the inspector to hold the passport firmly against the unit in order to perform the read. This means the inspector is not able to perform other parts of the inspection.

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Major Findings

- Full page readers have problems reading MRZs of worn or bent passports requiring inspector to press the passport firmly against the unit.
- Some full page readers required the inspector to read the MRZ and perform the chip read in separate movements.
- Correction of MRZ for Basic Access Control is subject to human error particularly when dealing with characters like zero and "O".
- Readers do not have consistency in handling type A and Type B chips.

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Major Findings

- Electro Magnetic Interference (EMI) issues are still a factor (e.g. if two readers are too close to one another).
- Shielding of passports may make the chip unreadable when the data page is read on flat bed readers if the chip is on the other side of the shield from the data page. The plunk readers are required to have the book open instead of closed.
- Some systems could not handle legacy travel documents.
- Wide variation in speed of access and processing.
- Mobile unit proved highly successful.
- More research is needed on impact of stapling on e-passport.

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Facial Image Acquisition

- Three different configurations used
  - Video using face finding via motion detection (2 versions)
  - Separate unit with traveler adjusting a mirror to see eyes
  - Still image triggered automatically by system
- Note: Existing US system has camera triggered by inspector and was at the port of entry. Still images already exist in the US-VISIT databases for this configuration.

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E-passport images from chip

Images retrieved from data page in e-passport

Images from live video systems

Images from self-adjusted unit

Image from still camera automatically activated by system

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Facial Capture - Findings

- Placement of camera critical
  - Recommend placement behind inspector.
  - System should be self-contained; no optical parts adjustable by officers.
  - Depth of field should extend from 8 inches on inspector's side to 2 feet beyond counter.
  - Special accommodations may be necessary for people in wheelchairs (standard fixed location cameras could not capture their faces with full-frontal pose).
- Illumination
  - Infra-red lighting should be built into the camera box.
  - Visible lighting must be examined on a location-by-location basis.

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Facial Capture - Findings

- Client application must display live and best-so-far image
- Officer must inspect images before final acceptance
- Automated quality control analysis of image may be helpful (e.g. verify image captured is specification compliant)
- Images scanned from e-passport data pages will probably not be reliably usable for automated comparison against image stored on the chip
- Compression/Decompression of images stored on some e-passports caused the image extracted to be of too poor a quality for automated facial comparison.
  - Images should be compressed only once in the process of creating the chip and must meet the guidelines of ICAO.

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Additional Considerations

- Inspectors must keep their eyes on the traveler at all times
- The 'feel' of the passport has been a part of fraud detection and inspectors will require training on the new versions
- E-passports with anti-skimming technology embedded in them will require that the passport be open for reading. All types of readers will have to read the chip regardless of where it is located. (That is, on either 'fold' once the book is placed flat on the reader)

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Next Steps

- Interoperability test in Japan during March is still very much needed
- Live test parameters will be refined based on findings of this mock port of entry session
- Refinements in readers necessary before nations can effectively integrate reading e-passports into existing inspection process
- ICAO / ISO development of a common set of core requirements to be presented to industry for 5 scenarios:
  1. Primary Inspection
  2. Mobile Inspection
  3. Self-service Kiosks
  4. Secondary / Document Investigation
  5. Production Quality Control

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Technology Alternatives - Readers

- Full Page
  - Flat reader and flat antenna
  - Flat reader and angled Antenna
- Swipe and Plunk
  - Separate MRZ swipe and semi vertical reader
  - Separate MRZ swipe and slotted reader
- Simulated Swipe with Plunk
  - MRZ in data file with flat reader
- Mobile reader
  - PDA with reader attachment (no MRZ read)

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