



# Automated Border Control – state of play and latest developments

Markus Nuppeney

Section S13 – Inspection Infrastructures and Architectures  
Federal Office for Information Security (BSI)



# Outline

---



- History of EasyPASS
- EasyPASS 2nd generation
  - State of play
  - BSI Technical Guidelines applied to EasyPASS
  - EasyPASS biometric workflow
- ABC in Europe
  - Current installations
  - Frontex ABC guidelines

# EasyPASS at a glance

---



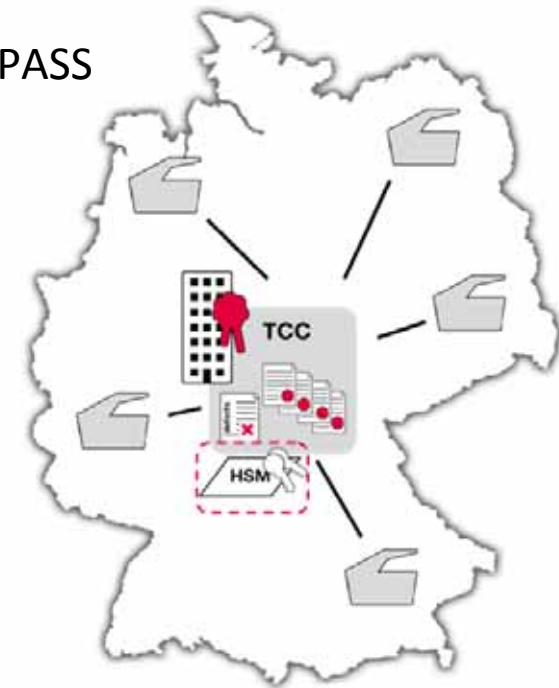
- EasyPASS := German Automated Border Control (ABC) system
- eGate setting := Integrated 2-Step
  - Step 1: document authentication
  - Step 2: biometric face comparison
- Each physical installation is composed of
  - a group of up to six self-service eGates
  - one monitoring station - monitoring (and if necessary interaction) by a border police officer
- Open for citizens of EU/EEA/CH (18+ years old) for crossing the Schengen border at German ports (so far airports only)
- Supported documents
  - Electronic passports
  - German electronic ID card

# EasyPASS history (2009 – 2013)



Federal Office  
for Information Security

- 2009 – 2010: EasyPASS initial pilot project
  - Group of four eGates and one monitoring station at Frankfurt airport
  - Focus on system/process design and biometrics
- 2011: EasyPASS PLUS (2nd pilot phase)
  - Support for the German electronic ID card in EasyPASS
  - Development and implementation of the background infrastructure (EAC-PKI)
  - Terminal Control Centre (TCC)
    - Management of certificates and keys
    - Authentication of connected terminals
    - ICAO-PKI: TCC for Passive Authentication (PA)
      - Central storage of trusted CSCA certificates
      - Centralized checking of DS certificates



# EasyPASS history (2009 – 2013)



Federal Office  
for Information Security

- 2009 – 2010: EasyPASS initial pilot project
  - Group of four eGates and one monitoring station at Frankfurt airport
  - Focus on system/process design and biometrics
- 2011: EasyPASS PLUS (2nd pilot phase)
  - Support for the German electronic ID card in EasyPASS
  - Development and implementation of the background infrastructure (EAC-PKI)
  - Terminal Control Centre (TCC)
- 2012: Cost benefit analysis and preparation of requirements set
- Q1 – Q2 2013: Tender
- July 2013: Contract for delivery of “EasyPASS 2nd generation” awarded to the consortium Bundesdruckerei GmbH/secunet Security Networks AG

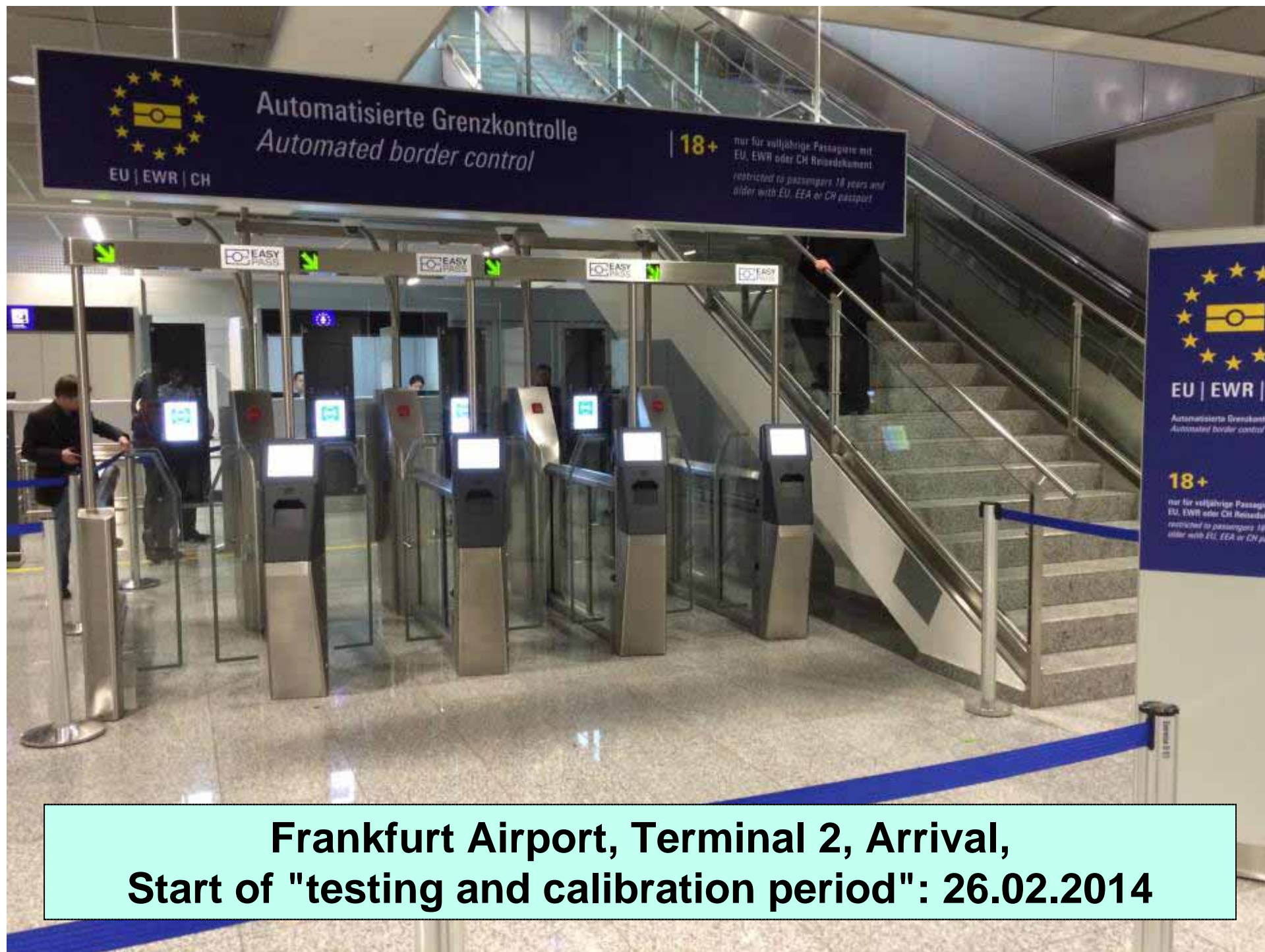


- Feb. 2014: First systems installed in Frankfurt and Munich and start of “testing and calibration period”
  - 10 eGates at two border control lines in FRA and MUC
- March 2014: First systems installed in Düsseldorf and Hamburg
  - 13 eGates at two border control lines in DUS and HAM
- Future
  - Q2/2014: 22 eGates at four border control lines in FRA, MUC and DUS
  - Q3/2014: 8 eGates at two border control lines in FRA and HAM
  - Q4/2014: 26 eGates at four border control lines in FRA and DUS
  - 2015+: EasyPASS at further airports (especially new Berlin airport (BER))



**Munich Airport, Terminal 2, Departure,  
Start of "testing and calibration period": 21.02.2014**





**Frankfurt Airport, Terminal 2, Arrival,  
Start of "testing and calibration period": 26.02.2014**

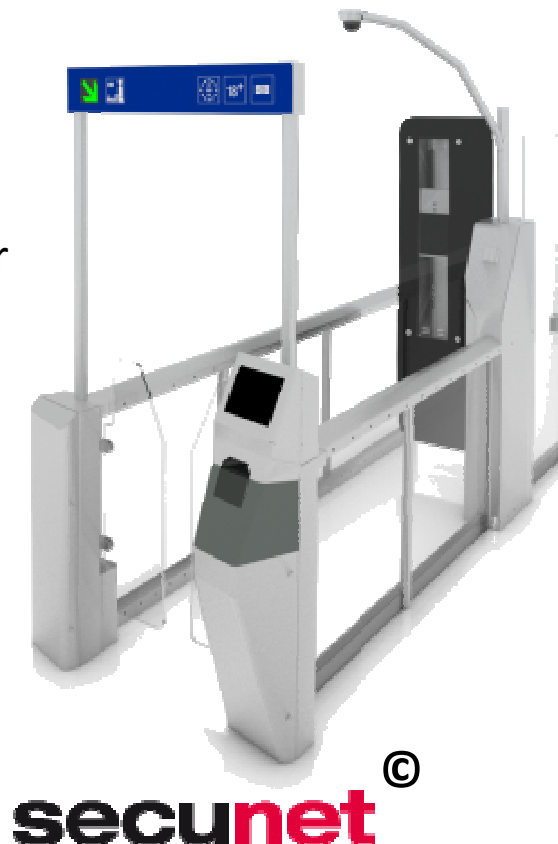


# EasyPASS 2nd generation – general physical design



Federal Office  
for Information Security

- Integrated 2-Step topology
  - Physical design comprising entry and exit door
  - Document reader in front of entry door
  - Biometric face capture unit mounted in exit door
- Servo-controlled, maintenance free door drives
- Stainless steel and tempered glass
- Side by side assembling into group of eGates
  - Typically four to six eGates per group



# EasyPASS 2nd generation – entry kiosk



Federal Office  
for Information Security

- First point of contact with the system by the traveler
  - Easy of use and ergonomics are key features for user acceptance
- Hardware
  - Document reader: VISOTEC Expert 600 OEM
    - Proven device which is in operation in manual border control as well
  - Guidance and feedback screen
    - Innovative user feedback incl. live stream from the optical reader
- Software
  - Bundesdruckerei VISOCORE
  - secunet BioMiddle and ePassportAPI
- Requirements regarding document reading and document authentication according to BSI Technical Guideline (TR-03135)



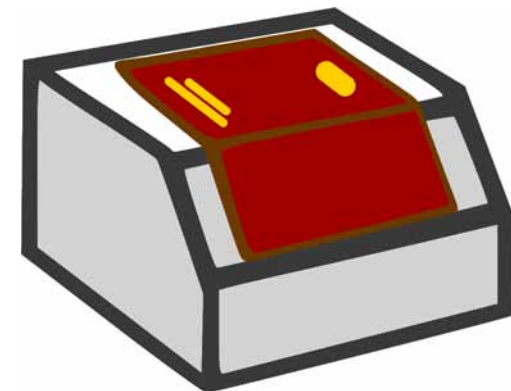
# BSI Technical Guideline (TR-03135) – computer aided eMRTD checks

---



Federal Office  
for Information Security

- BSI TR-03135 := „Maschinell gestützte Dokumentenprüfung in hoheitlichen Kontrollinfrastrukturen“
  - So far in German language only
  - English version in Q3/2014
- Version 1.2 available via BSI website: <https://www.bsi.de>
- Builds on and extends the requirements for document authentication as defined in the FRONTEX “Best Practice Technical Guidelines for ABC Systems”
  - Physical/optical document checks
  - Electronic checks
  - Good practice environment
  - XML logging scheme



# EasyPASS 2nd generation – biometric capture unit



Federal Office  
for Information Security

- Panel mounted into exit door
  - In direct walking direction of the traveler
- Guidance and live video feedback screen (digital mirror)
- Integrated lighting
  - Ensures high quality, properly illuminated images
- Automatic height adjustment
  - Movement of the entire capture unit (sensors, screen and lighting)
  - Full frontal images of persons from 120cm up to 220cm
- Requirements regarding biometrics according to BSI Technical Guideline (TR-03121)

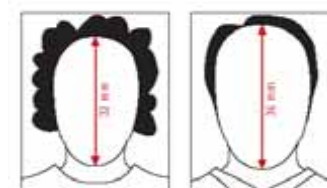


# BSI Technical Guideline (TR-03121) – Biometrics in Public Sector Applications



Federal Office  
for Information Security

- BSI TR-03121
  - Part 1: Framework
  - Part 2: Software Architecture
  - Part 3: Application Profiles and Function Modules
- Version 3.0 available via BSI website
- Enrolment, identification and verification profiles
  - EasyPASS Application Profile:  
“Verification ePassport and ID card using facial biometrics”
  - EasyPASS biometric workflow specified as Function Module composed of
    - Verification workflow
    - Evaluation workflow
  - XML logging scheme

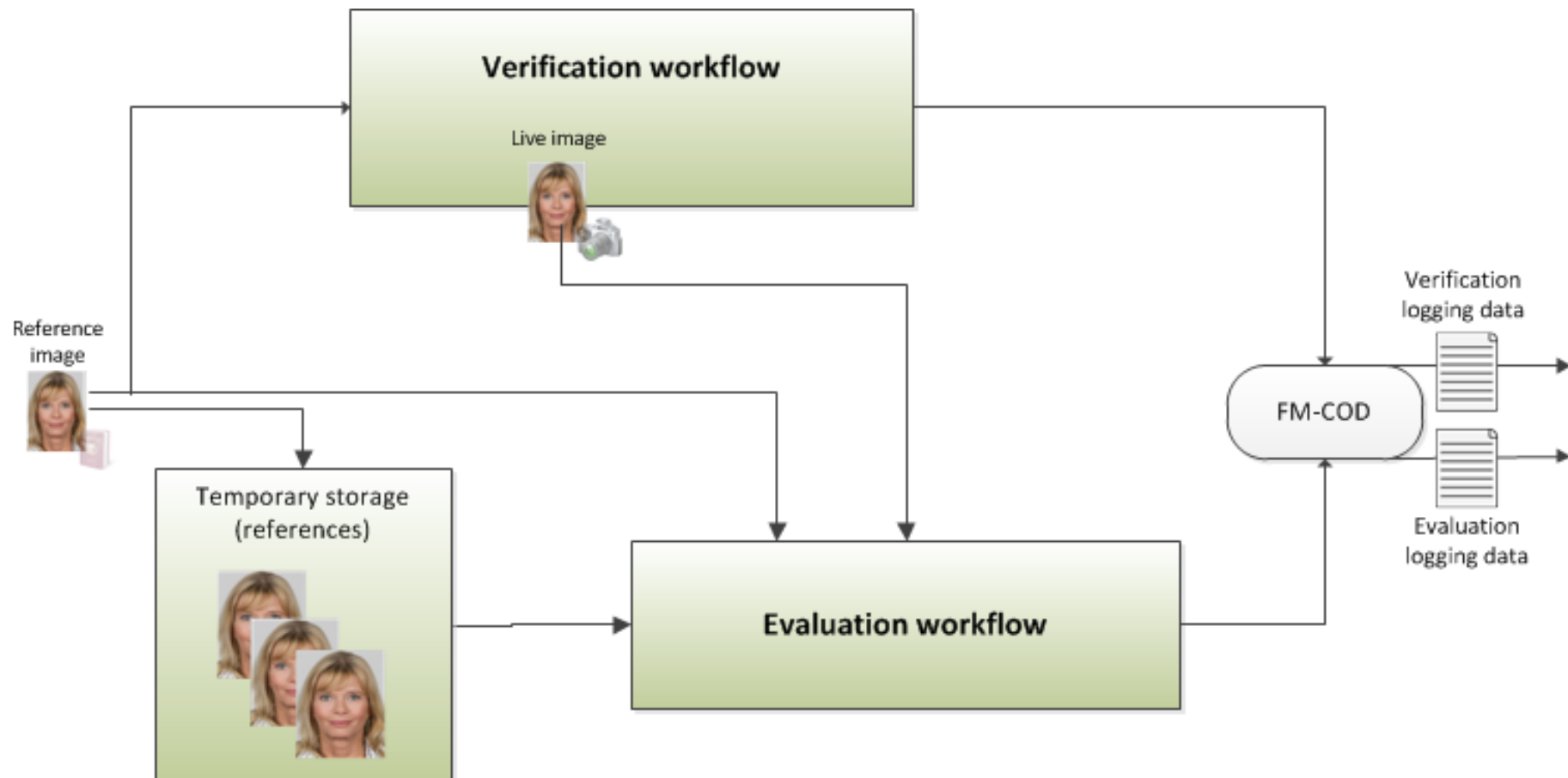




# BSI Technical Guideline (TR-03121) – EasyPASS biometric workflow



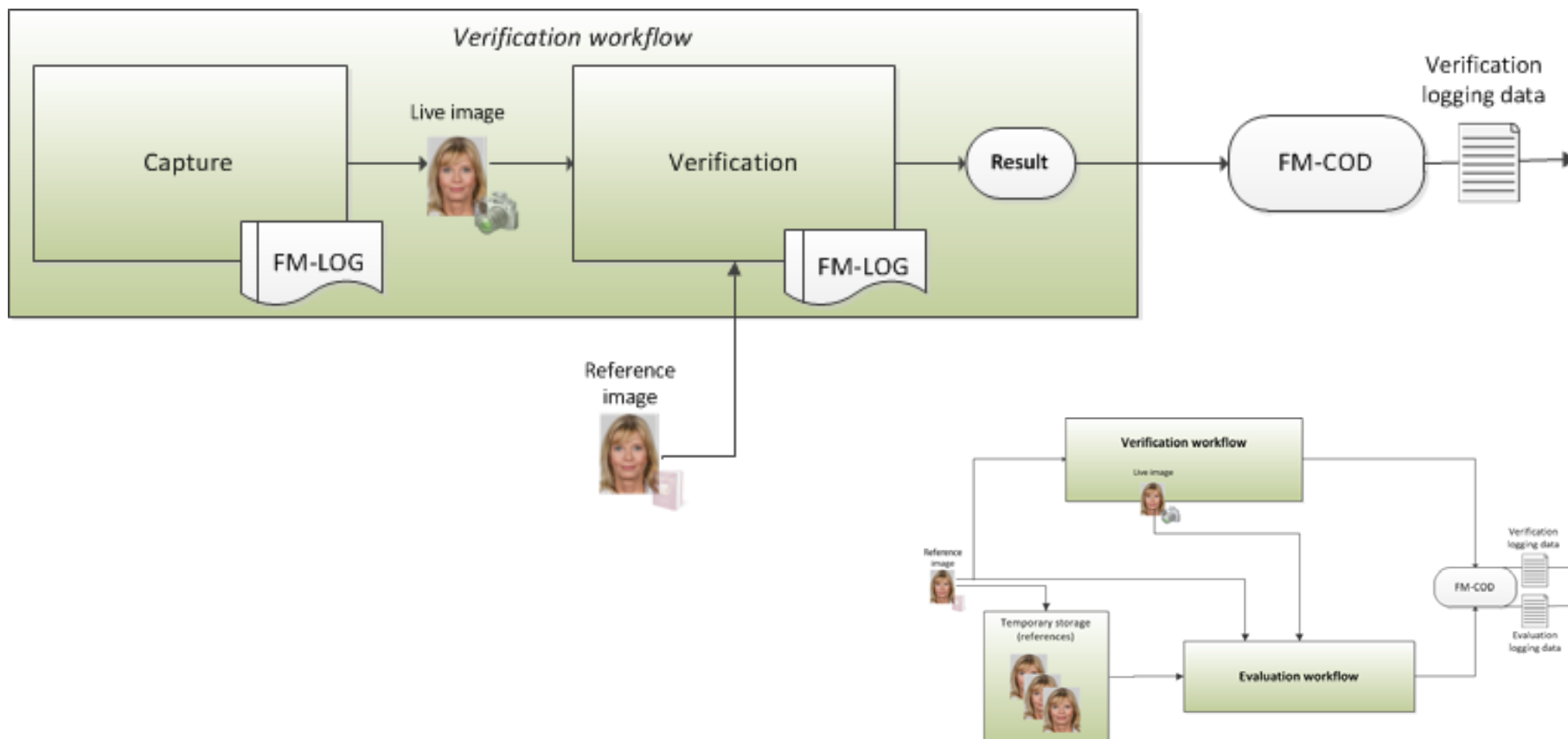
Federal Office  
for Information Security



# BSI Technical Guideline (TR-03121) – verification workflow



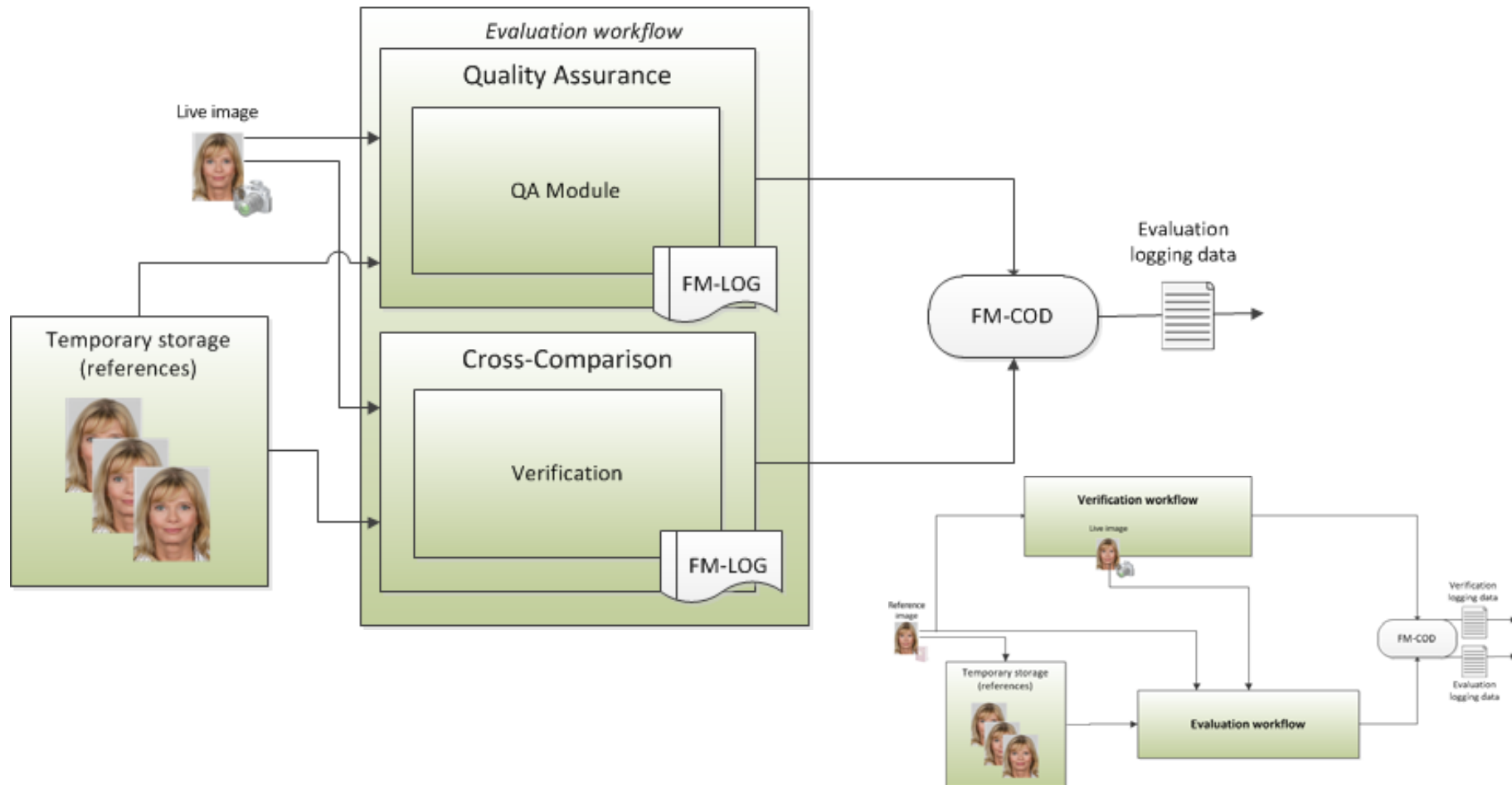
Federal Office  
for Information Security



# BSI Technical Guideline (TR-03121) – evaluation workflow



Federal Office  
for Information Security



# EasyPASS 2nd generation - figures and experiences



Federal Office  
for Information Security

- Over 60.000 transactions during March 2014
- About 16 sec. processing time per traveler (in the case of accept)
- Federal police is in general satisfied with the systems being in place, but the Operational Reject Rate (ORR) is still too high
  - Targeted ORR <10%
  - 1st goal: Achieve fraction to ORR from biometrics <5%
    - @ a defined biometric security level (FAR ≤ 0,1%)
  - 2nd goal: Achieve fraction to ORR from watch list and document checks <5%
    - Electronic document checks are very reliable (reject rate <0,1%)
    - Availability of trusted and up-to-date certificates (CSCA MasterList) is the biggest challenge regarding electronic document checks
  - 3rd goal: Optimize user guidance to avoid rejects due to travelers behavior

# ABC installations in Europe

---



- 13 European countries have ABC in place since
  - 2007-2009: PT, UK, FI, FR
  - 2010-2011: DE, ES, CZ, NL
  - 2012-2013: BG, NO, AT, IE, EE
- Systems can be used by EU/EEA/CH citizens
  - Third country nationals from JPN and KOR processed in addition by FI
- ePassport as token supported by all systems
  - National ID card in addition supported by DE and ES
- Almost every system supports facial biometrics
  - ES and EE are doing multimodal biometrics (face and fingerprint; Spanish ID card supports fingerprint match-on-card)
  - FR is doing fingerprint only



- Frontex ABC Working Group
  - WG was started in 02/2010 by NL, UK, FI, ES, PT, FR and DE
  - WG expanded in 2013 by CZ, IE, BG and Hongkong
  - Most recent documents
    - Best Practice Technical Guidelines for ABC Systems, v2.0, 08/2012
    - Best Practice Operational Guidelines for ABC Systems, v2.0, 08/2012
    - Both available via <http://frontex.europa.eu/publications/>
  - Current and future work
    - Updates of the existing guidelines expected for summer 2014
    - New guideline document under preparation regarding ABC systems for Third Country Nationals (TCN)

# Thank you!

---



Federal Office  
for Information Security

- Federal Office for Information Security (BSI)
- Markus Nuppeney
  - markus.nuppeney@bsi.bund.de
  - <https://www.bsi.de>

