Biometric Product Qualification Program for US Airport Access Control

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Outline of Presentation

- Scope
- Background
- QPL Process
- Contrasting Evaluation Reporting Methods
- Lessons Learned

Narrowing the Scope

Scope is **Biometric Product** Performance testing using **Scenario** evaluation techniques focused on Access Control applications using **1:1 Verification** matching

Biometric Product

Performance

Scenario

Access Control

1:1 Verification

Background

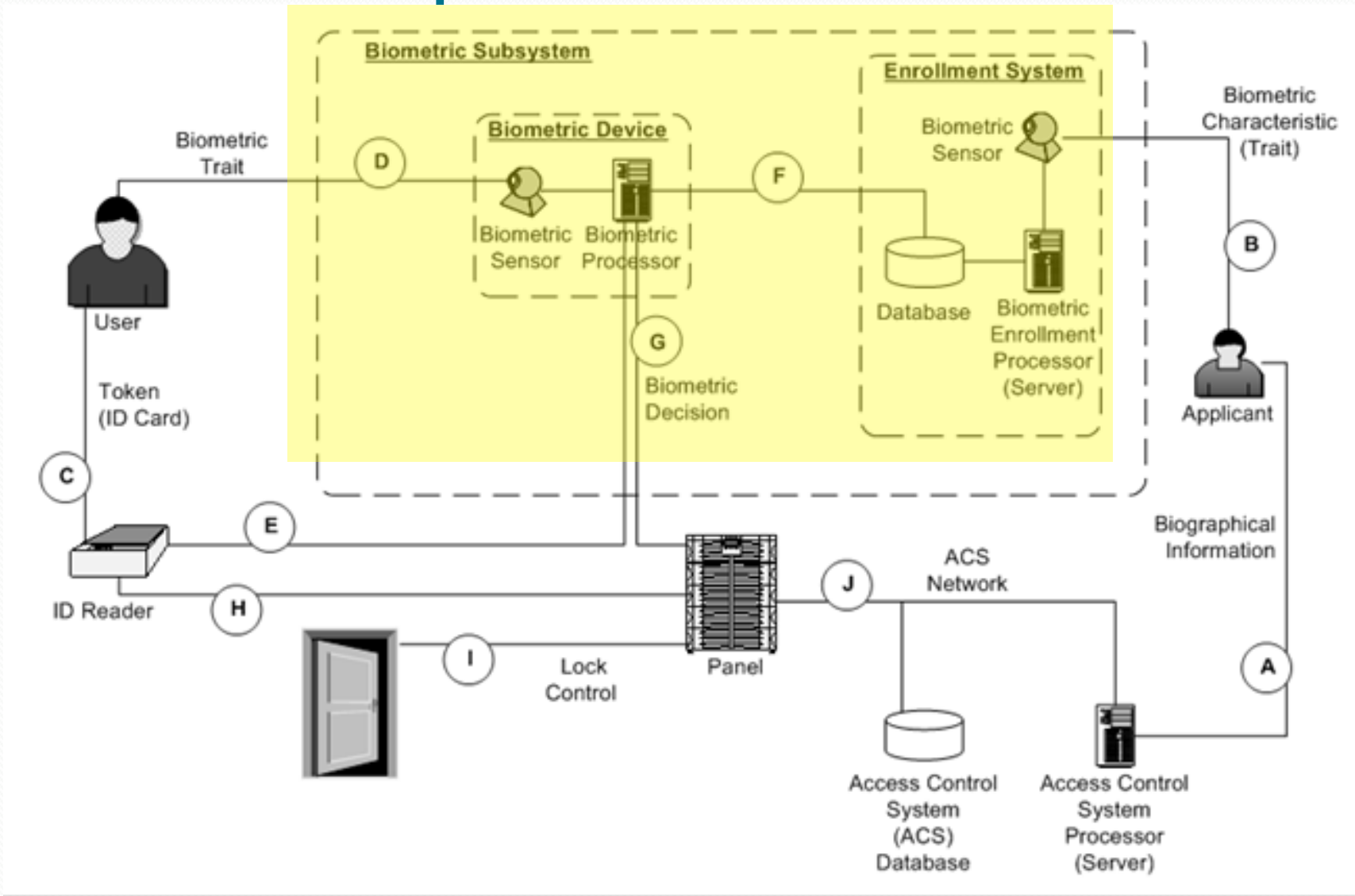
Specific information relates to US DHS TSA QPL

- Mandated in 2004 (US Public Law 108-458)
- Requirements and Process published - 2005
- Initial QPL – 2007
- Addition to QPL – 2009
- Process in place, on-going
- Specific to airport PACS

DHS – Department of Homeland Security
TSA – Transportation Security Administration

QPL – Qualified Products List
PACS – Physical Access Control System

Biometric portion of PACS



QPL Process – Event Sequence

- Airports demand for biometric product for PACS
- Manufacturers submit to **third-party testing** (fee based)
- Suitable testing organization delivers **performance report**
- TSA approves product ⟹ QPL
- Airports select from QPL for purchase

Key Test Characteristics

- Test crew size >250 (enroll), >200 (verify)
  - Plan for "drop-out"
- 4 visits: Enroll, 3 Revisits (~2 weeks apart)
  - Enrollment includes training and initial verification
- 5 genuine & 5 imposter transactions/revisit
  - Minimum 3000 transaction (each type)
  - Imposters are randomized from other crew members

Performance Metrics and Requirements Definition

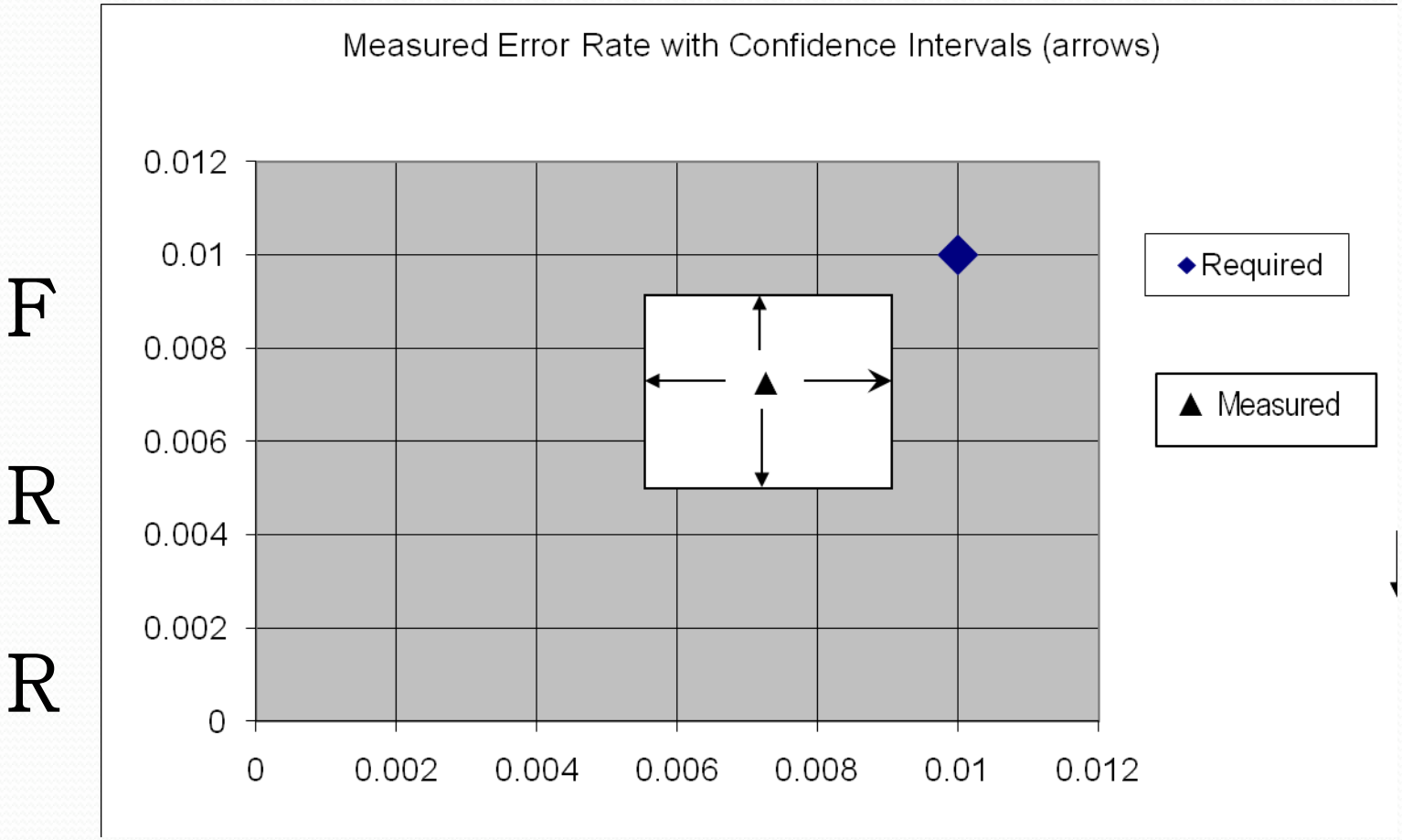
Pass/Fail testing must establish metrics, requirements and decision criteria

- False Accept Rate < 1%
- False Reject Rate < 1%
- Transaction Time < 6 seconds
- Failure to Enroll Rate < 3%

NOTES:

- Matching errors based on up to 3-attempt transactions
- Confidence bounds used to evaluate Pass/Fail
- Requirements set with industry, airport and NIST participation

Use of Confidence Bounds



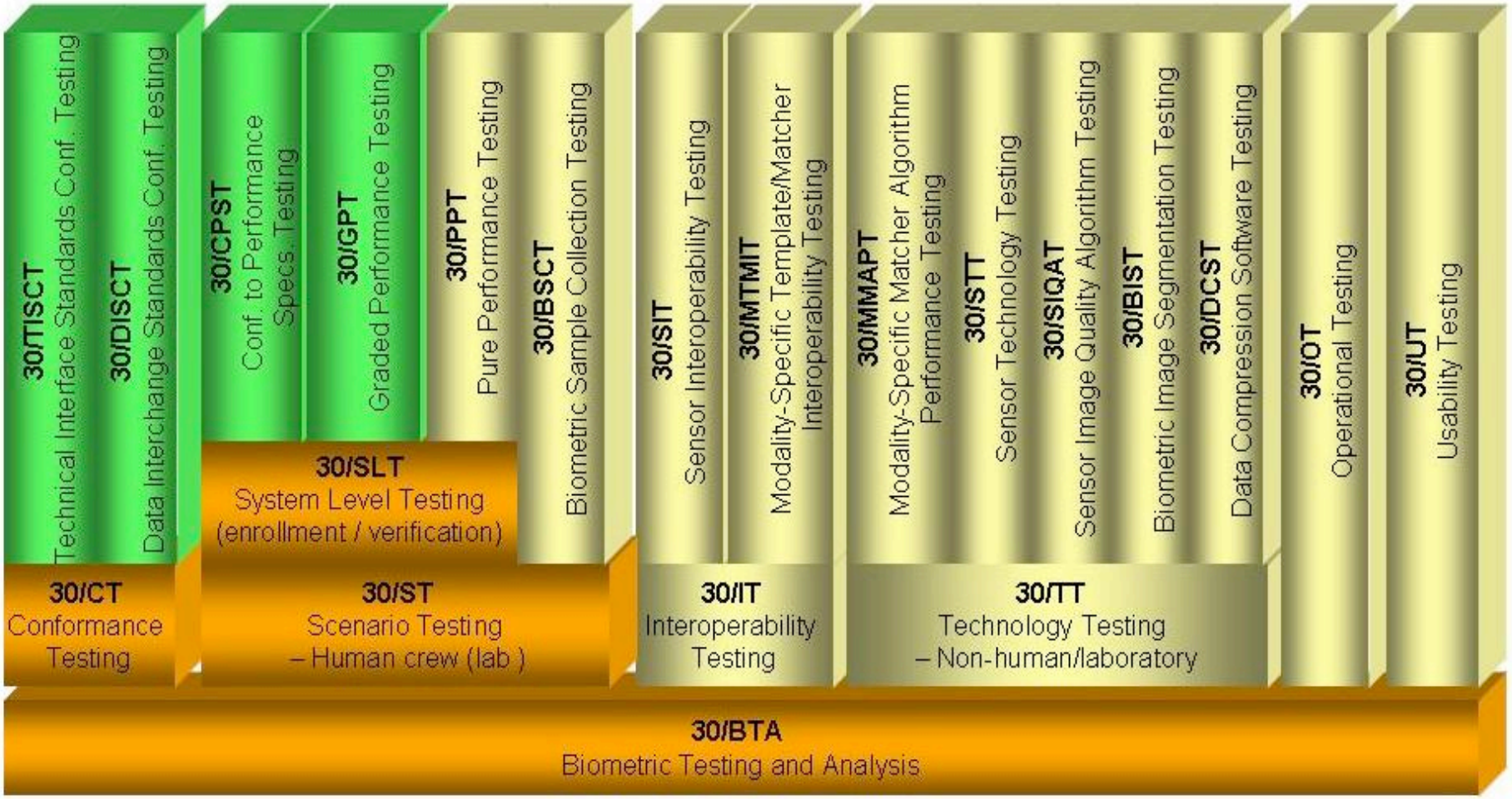
FRR

FAR

Scenario Testing Approaches

- Conformance to Performance Specification Testing
  - E.g. TSA QPL
  - Report only "Pass or Fail" (as one operating point)
- Graded Performance Testing
  - ISO Standard 19795-5 or INCITS 409.5
  - Matching grades range 0 (worst) to 6
- Pure Performance Testing
  - E.g. NPL or IBG (CBP series)
  - DET or ROC (typically)

NVLAP Biometrics "Scopes"



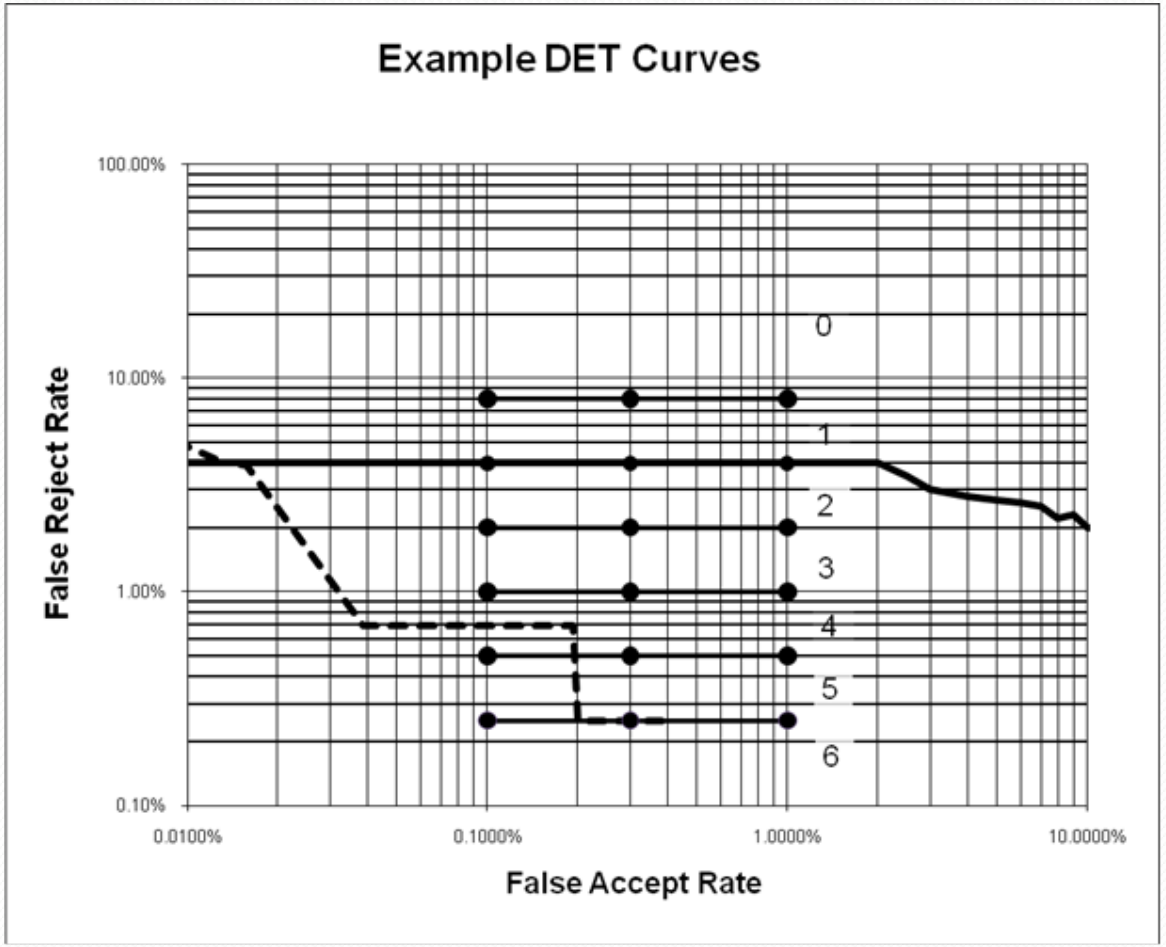
NVLAP Handbook 150-25, Figure A.3. Scopes of accreditation

Graded Performance

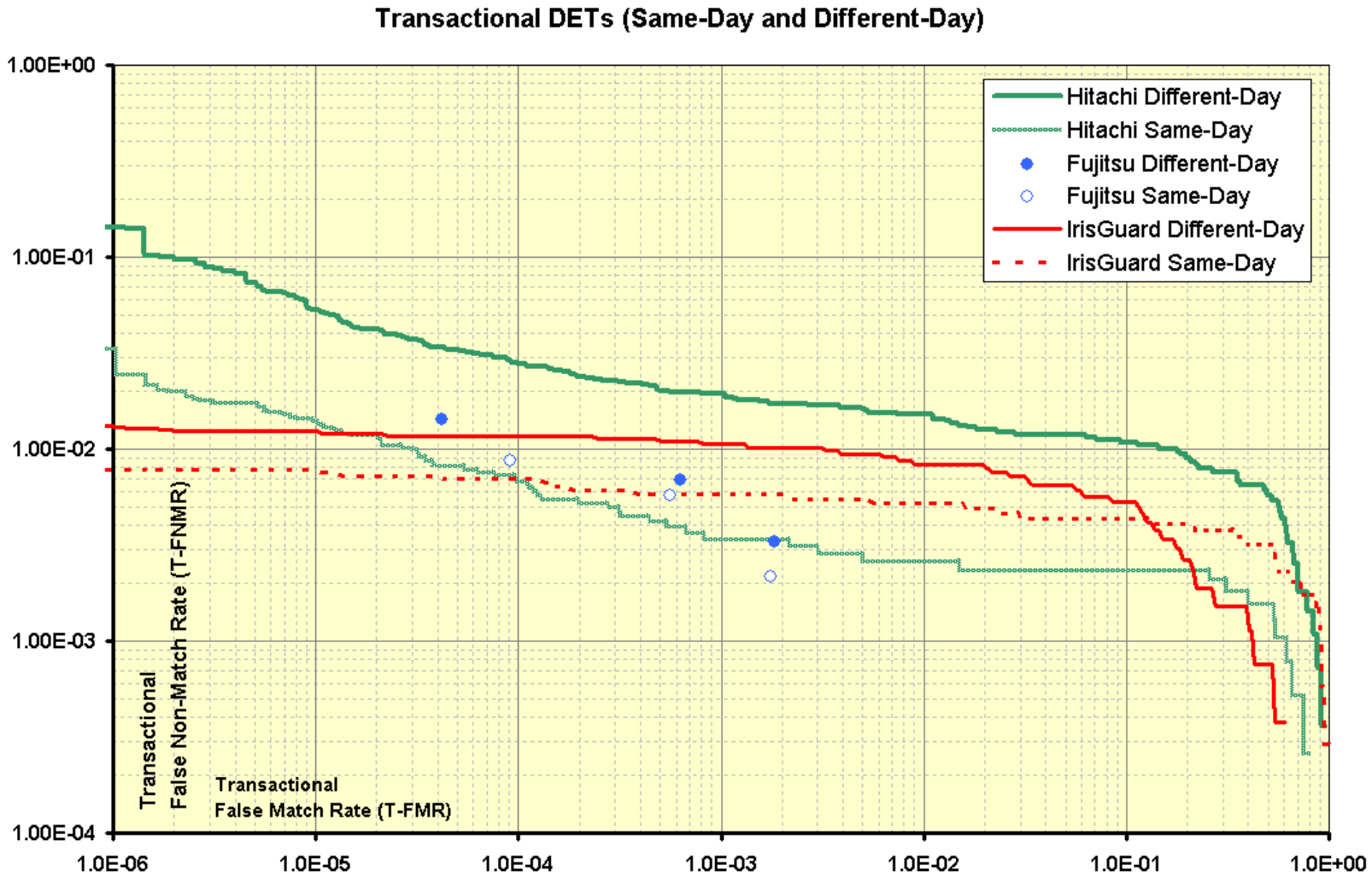
From ISO FCD 19795-5

- Shows 3-FAR level range (0.1 – 1.0%)
- Shows grades assigned at 6 FRR thresholds

<1% = grade 4



Pure Performance Reporting

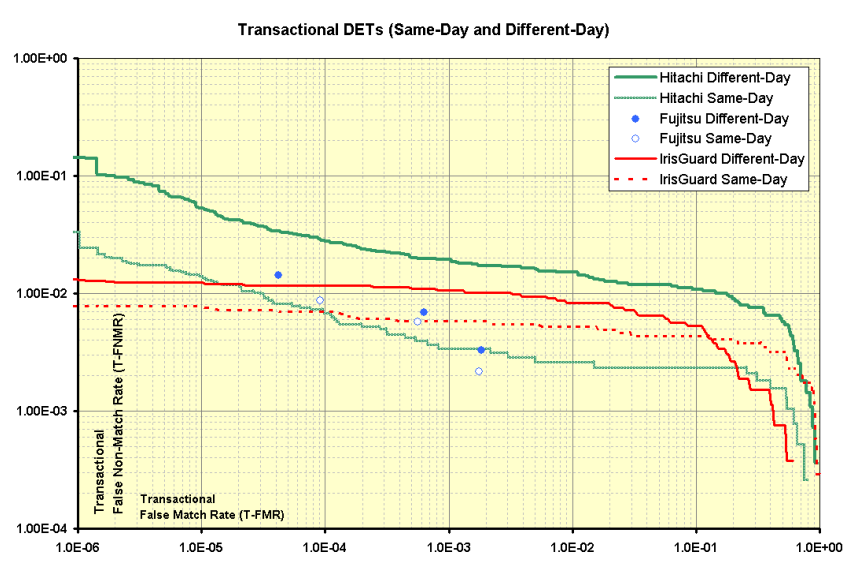


From IBG CBT 6 public report

Contrast in Results Reporting

Pure Performance – maximum information, more difficult to interpret
Graded Performance – typical operating range, shows performance levels
Pass/Fail – simplest, no indication of preference

Pure



Graded

Target FAR	0.1%	0.3%	1.0%
FRR Grade – **BLUE**	4	5	5
FRR Grade – **RED**	4	4	4
FRR Grade - **GREEN**	3	3	3

Pass/Fail

FRR Decision – **BLUE**	Pass
FRR Decision – **RED**	Pass*
FRR Decision – **GREEN**	Fail

* (depends on confidence level)

Lessons Learned

- Enrollment with multi-instance modalities
  - more complicated, needs written policy
- Identify need for re-enrollment
  - remove “avoidable goats”
- Criticality of threshold setting
  - responsibility – defined by process, enforced by lab, depends on supplier

Lessons Learned - 2

- Pass/Fail testing does NOT require access to matching scores (COTS configuration)
- Who controls Final Report dissemination to qualifying organization (lab or supplier?)
- Cost to participate is a deterrent to suppliers

Thanks for your attention

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