U.S. Department of Homeland Security
Washington, D.C. 20528

Homeland Security

22 June 2011

MEMORANDUM FOR: Rafael Borras
Under Secretary for Management

FROM: (b) (6)
Director, Operational Test and Evaluation

SUBJECT: Director of Operational Test & Evaluation Letter of Assessment for the Transportation Security Administration (TSA) L3 Communications ProVision 100 Advanced Imaging Technology (AIT) System with Automatic Target Recognition (ATR) Follow-on Operational Test and Evaluation (FOT&E)

1. In accordance with Department of Homeland Security Acquisition Directive 102-01, dated 20 January 2010, and DHS Acquisition Directive 026-06, dated 22 May 2009, the DHS Director, Operational Test and Evaluation (DOT&E) submits this Letter of Assessment (LOA) to inform an upcoming Acquisition Decision Event (ADE) 3 program review for procurement of the Automatic Target Recognition (ATR) block upgrade and modification of L3 Provision 100 Advanced Imaging Technology (AIT) systems nationwide.

2. The DOT&E concludes the L3 Communications ProVision 100 AIT System with ATR to be effective and suitable as tested based on the system meeting all Key Performance Parameters (KPPs). (b) (5) [redacted]

3. As with any new technology, as understanding of the technology matures, Test & Evaluation (T&E) strategies and efforts should likewise mature. (b) (5) [redacted]

(b) (5)

[redacted]

4. The DOT&E also wishes to commend the TSA and TSL T&E community in developing and implementing the ATR T&E strategy in light of evolving system requirements and current understanding of the underlying technology. In addition, DOT&E must note and commend the considerable efforts and level of cooperation and collaboration observed amongst the various TSA elements, including the T&E, program management, and user communities, with respect to the ATR initiative. Their efforts clearly demonstrated the considerable agility of, and expertise contained within the TSA to translate ATR functionality into a viable operational capability that is expected to result in considerable positive impact on the traveling public. The DOT&E appreciates the insightful comments received from the TSA to the initial draft of the DOT&E AIT ATR Letter of Assessment.

CC:
Domenico Cipicchio
TSA Deputy Assistant Administrator for Acquisition

(b) (6)
Director, Acquisition and Program Management Division

Enclosures:
1. Letter of Assessment
2. Acronym List

References:
(a) DHS Acquisition Directive 102-01, 20 January 2010
(b) DHS Acquisition Directive 026-06, 22 May 2009
(c) Delegation 10003 to the Director of Operational Test and Evaluation
(d) Operational Requirements Document for Advanced Imaging Technology System for Checkpoint Operations [redacted]

(e) Functional Requirements Document (FRD) for an Advanced Imaging Technology System with Automatic Target Recognition for Checkpoint Operations, Version 1.2, [redacted]
(f) Procurement Specification (PS) for Advanced Imaging Technology (AIT) for Checkpoint Operations, Version 2.11, [redacted]
(g) Imaging Technology for Checkpoint Screening Operations Detection Standard – Appendix, Version 3.3, [redacted] (classified)
(h) Operational Test Plan (OTP) for the Advanced Imaging Technology (AIT) System Automatic Target Recognition (ATR), [redacted]
(i) Action Memo, TSA, subject "Summary of Requirements for L-3 Advanced Imaging Technology (AIT) system with Automatic Target Recognition", [redacted]
(j) Action Memo, TSA, subject "Concurrence on the Qualification Testing and Evaluation (QT&E) for the Advanced Imaging Technology (AIT) with Automatic Target Recognition (ATR) by the User Community", [redacted]
(k) Action Memo, TSA, subject "Deficient Requirements from Qualification Testing of the Advanced Imaging Technology (AIT) system with Automated Target Resolution (ATR). [redacted]
(l) System Evaluation Report for the L3 Advanced Imaging Technology (AIT) System Automatic Target Recognition (ATR), [redacted]
(m) Final Report, Lab Qualification Test, L-3 ProVision 100, v3.8.13/14, [redacted]

Introduction

This Letter of Assessment (LOA) conveys the Department of Homeland Security Director of Operational Test and Evaluation (DOT&E)'s independent assessment of testing and evaluation conducted through the Transportation Security Administration (TSA)'s Office of Security Technology (OST) and other sources, on the Passenger Screening Program (PSP) AIT project with ATR capability. The TSA currently employs AIT systems from two different vendors to assist with primary screening of passengers at aviation checkpoint locations, to deter conveyance of prohibited items into the sterile area. Although based on different technologies, currently deployed AIT systems provide a fundamentally similar capability, actively interrogating passengers which results in imagery information that are then parsed by Transportation Security Officers (TSOs) for anomalies. Any anomalies noted are verbally conveyed from the Image Operator (IO – located in an isolated area from the checkpoint to address privacy concerns) to a TSO at the checkpoint for resolution. While the actual screening of the passenger is essentially the same, the ATR capability enhancement automates processing of sensor information, displaying areas where anomalies are noted on an "avatar," or generic representation of the passenger undergoing screening at the checkpoint, which are resolved in accordance with modified standard operating procedures. This LOA is intended to inform an upcoming Acquisition Review Board (ARB) - program review for procurement of the ATR block upgrade and modification of L3 Provision 100 AIT systems nationwide.

The LOA focuses on data and findings as described in the approved TSA System Evaluation Report (SER) dated 6 May 2011 for the FOT&E, which was conducted at:

- Hartsfield-Jackson Atlanta International Airport (ATL), Atlanta, GA,
- Ronald Reagan National Airport (DCA), Arlington, VA, and
- McCarran International Airport (LAS), Las Vegas, Nevada

in the February-March 2011 timeframe. Three previously fielded L3 ProVision 100 systems were modified to include the ATR capability to assist with primary screening of passengers as systems of record under realistic demand profiles. Other currently operating AIT systems within each common checkpoint environment were not modified, to provide a credible comparative baseline for evaluation purposes. The LOA also includes findings and conclusions provided by complementary technical testing and evaluation efforts, primarily those conducted by the DHS Transportation Security Laboratory (TSL) as conveyed in the final Lab Qualification Test report dated 9 May 2011, as well as system detection performance data provided by the TSL in various classified briefings and reports, and observations gleaned by DOT&E during test bed site visits.

Background and System Description

AIT (formerly Whole Body Imager, or WBI) systems have been employed by the TSA as a component of various "pilot" projects involving both primary and secondary screening of passengers in aviation checkpoint environments. Vice Walk-through Metal Detectors (WTMDs), which are fundamentally limited to detection of metallic items, AIT systems have the potential to assist TSOs with non-invasive primary screening of passengers for potential anomalies [redacted]. However [redacted]

(b) (5)

(b) (5)

The L3 Communications ProVision 100 with ATR capability is intended to provide an automated passenger screening assist tool based on active millimeter wave technology, and is currently being considered for implementation on previously procured AIT units deployed for primary passenger screening as well as for future procurements. Passengers enter the system and are instructed to assume a common "ballerina" pose, at which time the scanner unit is activated via the operating console. If the scan is successful, any anomalies detected by the system are superimposed on an avatar image located on the operator panel (see Figure 1). Based on this information, the TSO either clears the passenger for Level I screening, or implements resolution procedures in accordance with standard operating procedures. Figure 2 below provides a nominal depiction of the L3 ProVision 100 system with ATR enabled (b)(3), 49 USC 114(r)

(b)(3), 49 USC 114(r)

Figure 1. Operator Control Panel.

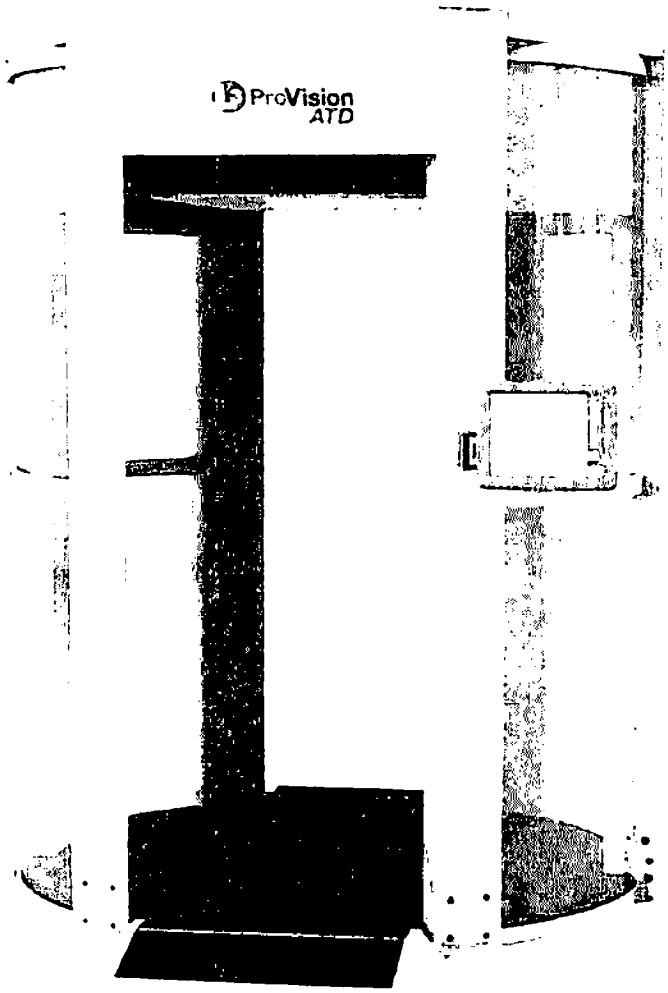


Figure 2. L3 ProVision 100 with ATR (production version)

DOT&E Assessment of Test and Evaluation Adequacy

In general, the Operational Test Agent conducted FOT&E as described in the approved Test and Evaluation Master Plan (TEMP) and Operational Test Plan (OTP). The scope of the evaluation effort focused on the contributions of the AIT ATR system in supporting the TSA's passenger screening mission. (b) (5)

(b)(5)

[redacted]

The field portion of the FOT&E was conducted at three separate airport checkpoint locations, with typically-trained, representative TSOs operating the modified AIT units for passenger screening in accordance with the approved standard operating procedures and general concept of operations, as follows:

- Passengers were screened via the AIT as presented during typical checkpoint operations, with TSOs serving as divestment "coaches," to remind passengers to fully divest articles per the SOP.
- Passengers entering the AIT were instructed by the Screening Operator (or SO, which is to be the same sex as the passenger) to assume the proper scanning position. Once the passenger is positioned, the SO initiates the scan.
- The Screening Operator reviews the information provided by the AIT with ATR enabled. If the system indicates a clear, the passenger continues through the aviation checkpoint screening process. If the system indicates that anomalies are present (as displayed on the control console and avatar), these are resolved in accordance with the current Screening Checkpoint SOP.

(b)(5)

[redacted]

While utilization profiles, passenger base, interactions with TSOs, etc., can vary considerably between airports (and even within an airport, at different checkpoint locations), there is a reasonable expectation that FOT&E findings can be generally extrapolated as to expected AIT performance for screening passengers for domestic travel nationwide.

Summary of Key Findings

The LOA focuses on data and findings as described in the approved TSA System Evaluation Report (SER) dated 6 May 2011 for the FOT&E. The LOA also includes findings and conclusions provided by complementary technical testing and evaluation efforts, primarily those conducted by the DHS Transportation Security Laboratory (TSL) as conveyed in the final Lab Qualification Test report dated 9 May 2011, as well as system detection performance data

provided by the TSL in various classified briefings and reports, and observations gleaned by DOT&E during test bed site visits.

Based on test results, all Key Performance Parameters (KPPs - Table 1 below) as defined in the approved ORD were satisfied based on Qualification Test results, as well as results obtained through the FOT&E at ATL, DCA, and LAS under the noted test conditions.

Table 1. Key Performance Parameters*

Key Performance Parameter		Threshold / Objective
Section 3.1.1	Probability of Detection (Pd)	(b) (5)
Section 4.7.2.1	Safety	
Section 3.1.1.2	Throughput	
Section 4.5	Availability**	

* Per ORD dtd [redacted]

** [redacted]

Additional system performance details are as follows:

1. **Mission Performance –**
   a. **Sensitivity (Probability of Detection)** – (b) (5) [redacted]

(b) (5)

[redacted]

b. **Selectivity (False Alarm Rate)** (b) (5)

[redacted]

c. **Throughput –** (b) (5)

[redacted]

2. **Interoperability –** (b) (5)

[redacted]

3. **Reliability, Maintainability, and Availability (RM&A) -** (b) (5) [redacted]

4. **Logistics Supportability –** (b) (5) [redacted]

5. **Human-system Integration (HSI)** [redacted] (b) (5)

(b) (5)

6. **Information Assurance –** (b) (5)

Conclusions

All Key Performance Parameters relative to ATR implementation were satisfied as tested.

(b) (5)

(b)(3), (b)(5), 49 USC 114(r)

(b)(3), (b)(5), 49 USC 114(r)

[redacted]

(b) (5)

[redacted]

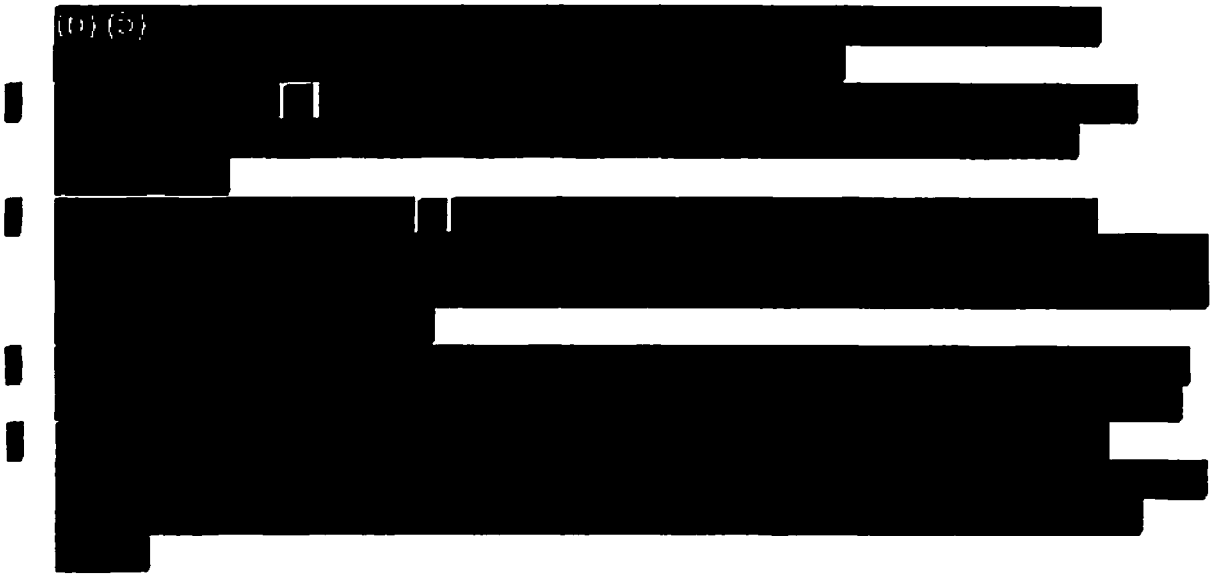
Recommendations for Future Test and Evaluation – (b) (5)

[redacted]

- (b) (5)

[redacted]

(b) (5)



Acronym List

ADE- Acquisition Decision Event
AIT- Advanced Imaging Technology
ATL- Hartsfield-Jackson Atlanta International Airport
ATR- Automatic Target Recognition
ARB- Acquisition Review Board
DCA- Ronald Reagan National Airport
DHS- Department of Homeland Security
DOT&E- Director of Operational Test & Evaluation
FOT&E- Follow-on Operational Test & Evaluation
HFE- Human Factors Engineering
HSI- Human-system Integration
IA- Information Assurance
IO- Image Operator
KPP- Key Performance Parameter
LOA- Letter of Assessment
LAS- McCarran International Airport
MTBCF- Mean Time Between Critical Failure
OA- Operational Availability
OCP- Operator Control Panel
ORD- Operational Requirements Document
OSHE- Occupational, Safety, Health, Environment
OSO- Office of Security Operations
OST- Office of Security Technology
OTA- Operational Test Agent
OTK- Operational Test Kit
OTP- Operational Test Plan
PMO- Program Management Office
PSP- Passenger Screening Program
RM&A- Reliability, Maintainability, & Availability
SET- System Evaluation Team
SER- System Evaluation Report
SME- Subject Matter Expert
SO- Screening Operator
SOP- Standard Operating Procedure
STIP- Security Technology Integrated Program
T&E- Test & Evaluation
TEMP- Test and Evaluation Master Plan
TSA- Transportation Security Administration
TSE- Transportation Security Equipment
TSL- Transportation Security Laboratory
TSO- Transportation Security Officers
VV&A- Verification, Validation & Accreditation
WBI- Whole Body Imager
WTMD- Walk Through Metal Detector