Problem Discovery Affecting Operational Test and Evaluation

One purpose of test and evaluation is to determine if thresholds in the approved Capability Production Document (CPD) have been satisfied. The Acquisition Executive needs this information in making production decisions, but satisfying these measures is often not equivalent to achieving the required combat capability needed for mission accomplishment. A comprehensive evaluation of operational effectiveness, operational suitability, and survivability provides the Acquisition Executive and operational users with information regarding a system's combat capability. This evaluation can only be done after operational testing (OT) under realistic combat conditions, which includes end-to-end testing with operational users across the intended operational envelope and within the context of the system-of-systems in which it will operate.

The Deputy Assistant Secretary of Defense (DASD) Developmental Test and Evaluation (DT&E) conducts an assessment of all Major Defense Acquisition Programs and special interest programs prior to their OT; this DT&E assessment reports on a system's demonstrated ability to meet its Key Performance Parameters and assesses the risk of the system's ability to successfully complete OT. The DT&E assessment is based on capabilities demonstrated during developmental testing (DT), early OT, and criteria from the Test and Evaluation Master Plan and requirements documents. The DT&E community engages with program offices early and often throughout a program's acquisition cycle, observing both contractor and government DT. The DT and early OT events provide the program manager opportunities to discover and correct problems that could prevent a system from delivering its required combat capability. As such, the test events should include as much operational realism as possible, and also include military operators and maintainers whenever possible. The early test events should also provide information to the requirements and resource sponsors for the system to ensure that the documented requirements are still relevant and feasible. By the time of the Initial Operational Test and Evaluation (IOT&E), discovery of significant issues affecting combat capability should be rare, and lingering problems from DT should have been resolved.

Last year, I added a new section to my Annual Report assessing systems under my oversight in 2010-2011 with regard to problem discovery during testing. My assessment fell into two categories: systems with significant issues observed in OT that should, in my view, have been discovered and resolved prior to the commencement of OT, and systems with significant issues observed during early testing that, if not corrected, could adversely affect my evaluation of those systems' effectiveness, suitability, and survivability during IOT&E. This year, I am providing an update to the status of those systems identified last year, as well as my assessment of systems under my oversight in 2012 within those two categories.

Last year, I reported that four of the seven Assessments of Operational Test Readiness (AOTRs) that I received from the DASD(DT&E) recommended that the programs not proceed to IOT&E, but that the program proceeded anyway. Regardless of the AOTR recommendation, six of those seven programs experienced significant issues in their IOT&Es: the C-5 Reliability Enhancement and Re-Engining Program (RERP); RQ-4B Global Hawk Blocks 20 and 30; Standard Missile-6 (SM-6); Multi-functional Information Distribution System (MIDS) Joint Tactical Radio System (JTRS); Stryker Nuclear, Biological, and Chemical Reconnaissance Vehicle (NBCRV); and Joint Tactical Radio System (JTRS) Handheld, Manpack, and Small Form Fit (HMS) Rifleman Radio.

I have received 12 additional assessments from DASD(DT&E) since my report last year; these are listed in the table below. Of the 12 reports, 2 recommended not proceeding to IOT&E: MQ-1C Gray Eagle and JTRS HMS Manpack Radio. Despite the recommendation, both of these systems proceeded to IOT&E. The JTRS HMS Manpack Radio performed poorly in the IOT&E, as predicted by the AOTR; however, the MQ-1C Gray Eagle performed well in IOT&E despite DT results suggesting poor reliability that would affect the test outcome. In fact, the Gray Eagle IOT&E demonstrated that the modeling assumptions that established the reliability requirements thresholds were not valid. As a result, the Army is reassessing whether those reliability thresholds should be changed. Additionally, as discussed in this section last year, the Warfighter Information Network – Tactical (WIN-T) Increment 2 had both performance and reliability issues during early testing, but these issues were not assessed by the DT&E AOTR. Two of the systems listed below are still in-test: P-8 and Joint Space Operations Center (JSpOC) Mission System (JMS) Increment 1.

DASD(DT&E) Assessments of Operational Test Readiness (AOTRs)	
AIM-9X Air-to-Air Missile Upgrade	Joint Space Operations Center (JSpOC) Mission Systems (JMS) Increment 1
Apache Block III	Joint Tactical Radio System (JTRS) Handheld, Manpack, and Small Form Fit (HMS) Manpack Radio
B-2 Extremely High Frequency (EHF)	MQ-1C Gray Eagle Unmanned Aircraft System (UAS)
C-130 Avionics Modernization Program (AMP)	P-8
E-2D Advanced Hawkeye	Space-Based Infrared System (SBIRS)
HC/MC-130J	Warfighter Information Network – Tactical (WIN-T) Increment 2

PROGRESS UPDATES ON DISCOVERIES REPORTED LAST YEAR

Last year, I identified 23 systems that had significant issues in early testing that should be corrected prior to IOT&E. The following table provides an update on the progress those systems made in implementing fixes to those problems.

FY11 DISCOVERIES IN EARLY TESTING THAT SHOULD BE CORRECTED PRIOR TO IOT&E			
Fixes Implemented and Demonstrated in OT	**Fixes Implemented; Currently in OT or Planning OT**	**Some Fixes Implemented; Testing Constrained Pending Future Acquisition Decisions**	**No Fixes Planned**
Apache Block III	Aegis Modernization	Joint Tactical Radio System (JTRS) Handheld, Manpack, and Small Form Fit (HMS) Manpack Radio	Defense Enterprise Accounting and Management System (DEAMS)
EProcurement	AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM)	RQ-4B Global Hawk Block 30 High-Altitude, Long-Endurance Unmanned Aerial System (UAS)	LHA-6
Joint Tactical Radio System (JTRS) Network Enterprise Domain (NED)	AN/TPQ-53 Radar (formerly the Enhanced AN/TPQ-36 Radar System (EQ-36))	Vertical Take-Off and Landing Unmanned Aerial Vehicle (VTUAV)	Littoral Combat Ship (LCS) Mission Modules
MQ-1C Gray Eagle Unmanned Aircraft System (UAS)	E-2D Advance Hawkeye		MQ-9 Reaper Armed Unmanned Aircraft System (UAS)
Spider XM7 Network Command Munition	Joint High Speed Vessel (JHSV)		
	Miniature Air-Launched Decoy – Jammer (MALD-J)		
	Mk 48 Advanced Capability (ADCAP) Mod 7 Common Broadband Advanced Sonar System (CBASS)		
	Mk 54 Lightweight Torpedo		
	P-8A Poseidon		
	Surveillance Towed Array Sensor System (SURTASS) with Compact Low Frequency Active (CLFA)		
	Warfighter Information Network – Tactical (WIN-T)		

Last year, I identified 17 systems that had significant issues in IOT&E that should have been discovered and resolved prior to commencement of operational testing. The following table provides an update on the status of those systems, as well as the progress those systems have made in implementing fixes to the problems.

FY11 DISCOVERIES IN IOT&E THAT SHOULD HAVE BEEN RESOLVED PRIOR TO OPERATIONAL TEST			
Fixes Implemented and Demonstrated in FOT&E	**Fixes Implemented; But New Issues Discovered**	**Fixes Implemented; Currently in OT**	**No Fixes Planned**
C-130J	AGM-88E Advanced Anti-Radiation Guided Missile (AARGM)	LPD-17	Force XXI Battle Command Brigade and Below (FBCB2) Joint Capabilities Release (JCR)
Common Aviation Command and Control System (CAC2S)	Standard Missile-6 (SM-6)	Nett Warrior	Stryker Nuclear, Biological, and Chemical Reconnaissance Vehicle (NBCRV)
CV-22 Osprey			Vertical Launch Anti-Submarine Rocket (VLA) with Mk 54 Mod 0 Lightweight Hybrid Torpedo
Department of the Navy (DoN) Large Aircraft Infrared Countermeasures (LAIRCM)			
Financial Information Resource System (FIRST)			
Multi-functional Information Distribution System (MIDS) Joint Tactical Radio System (JTRS)			
Navy Multiband Terminal (NMT)			
Space-Based Space Surveillance (SBSS)			
Additionally, 2 of 17 programs were cancelled: Early Infantry Brigade Combat Team (E-IBCT) and Joint Tactical Radio System (JTRS) Ground Mobile Radio (GMR).			

PROBLEMS DISCOVERED DURING OPERATIONAL TEST AND EVALUATION THAT SHOULD HAVE BEEN DISCOVERED DURING DEVELOPMENTAL TEST AND EVALUATION

SIGNIFICANT DISCOVERIES IN FY12 IOT&E	
AGM-88E Advanced Anti-Radiation Guided Missile (AARGM)	Key Management Infrastructure (KMI) Increment 2
ALR-69 Radar Warning Receiver (RWR)	Mine Resistant Ambush Protected (MRAP) Caiman Multi-Terrain Vehicle (CMTV)
Battle Control System – Fixed (BCS-F) Release 3.2	Mine Resistant Ambush Protected (MRAP) Dash Ambulance
Distributed Common Ground System – Army (DCGS-A)	Miniature Air-Launched Decoy – Jammer (MALD-J)
E-2D Advanced Hawkeye	MV-22 Osprey
E-3 Airborne Warning and Control System (AWACS) Block 40/45 Upgrade	Standard Missile-6 (SM-6)
Joint Mission Planning System – Air Force (JMPS-AF) Mission Planning Environment (MPE) E-8	*Virginia* Class Submarine Modernized with the APB-09 Acoustic Rapid Commercial Off-the-Shelf (COTS) Insertion (A-RCI) Sonar System and AN/BYG-1 Combat Control System
Joint Tactical Radio System (JTRS) Handheld, Manpack, and Small Form Fit (HMS) Manpack Radio	Warfighter Information Network – Tactical (WIN-T) Increment 2
Joint Tactical Radio System (JTRS) Handheld, Manpack, and Small Form Fit (HMS) Rifleman Radio	

AGM-88E Advanced Anti-Radiation Guided Missile (AARGM)

The AARGM program spent most of FY11 correcting hardware and software deficiencies discovered in DT and during its first IOT&E attempt. Once IOT&E began the second time, the Navy provided requirements changes in response to deficiencies identified since the first IOT&E attempt was terminated, and hence, the test scenarios were less stressing than originally planned. Additionally, new anomalies were discovered:

- AARGM Guidance Section/Control Section communication failures caused a significant number of operational mission failures. The problem occurred during specific IOT&E threat scenarios, but the system deficiency identified is one that should have been identified with adequate DT&E.
- A classified deficiency in performance required an adjusted threat representation.

ALR-69 Radar Warning Receiver (RWR)

The Air Force began operational flight testing in May 2012, knowing that the system would likely not meet several thresholds based on DT that occurred between February and May 2011. Additional deficiencies were observed in OT:

- Threat symbol splitting (when one threat signal received by the system produces multiple threat symbols at different azimuths on the cockpit display) degraded the aircrew's situational awareness as to which displayed threats are "real," where those real threats are located, and inhibited the aircrew's ability to appropriately react to the threat(s) in a timely manner. The threat symbol splitting deficiency did not occur during DT. The program believes it was strictly a software timing problem, and they modified the software and demonstrated the fix in the laboratory after the IOT&E. No flight testing has been accomplished to verify the fix.

Battle Control System – Fixed (BCS-F) Release 3.2

The Air Force conducted OT of BCS-F from April through August 2012, at the System Support Facility (SSF) and all four U.S. operational air defense sectors.

- A critical deficiency was discovered during OT at the Eastern Air Defense Sector. Random tracks were not being passed from the BCS-F system to the Joint Air Defense Operations Center at Bolling Air Force Base, Washington, D.C. This deficiency causes a loss of situational awareness for the operators conducting surveillance of the National Capital Region and results in an inaccurate air picture. The problem with the forwarding of tracks could not be identified at the

SSF during DT&E since the SSF cannot replicate sector link architecture.

Distributed Common Ground Station – Army (DCGS-A)

The Army conducted the DCGS-A Software Baseline 1.0 IOT&E from May through June 2012 at Fort Stewart, Georgia. DOT&E found the system not operationally effective, not operationally suitable, and not survivable because of deficiencies identified in the OT:

- Effective workflow is inhibited for the development of intelligence products to support operations because the system configuration as tested placed the fusion capability in the Secret Compartmented Information (SCI) (high) side even though most of the data necessary for fusion are in the Secret (low) side. Additionally, collection management tools are on the high side, but collection managers need to work closely with the brigade operations staff on the low side. Human intelligence tools are split between the high side and low side, but human intelligence analysts manage and interview their sources on the low side. Developmental testing and Early User Testing were conducted in a laboratory environment that did not replicate the physical separation and security barriers of the deployed configuration.
- The targeting software in the SCI enclave used first known location rather than the last known location. The DT showed the target algorithm to be correct, but was not robust enough to discover this deficiency.
- DCGS-A was not reliable because of a large number of software problems. The program has not rigorously tracked metrics identifying trends in software maturity, such as the number of new software problems opened and the number of software problems closed.

E-2D Advanced Hawkeye

The Navy conducted the E-2D IOT&E from February to September 2012. The evaluation is currently ongoing, but the following deficiencies were revealed:

- Cooperative Engagement Capability (CEC) software deficiencies associated with the CEC system generating multiple tracks for the same contact were outstanding upon entering IOT&E; thus, CEC was decoupled from the E-2D IOT&E. Corrections to the CEC system have continued throughout 2012. The system is now in test. It is likely that current E-2D fixes will not address all shortfalls in the current CEC system. Ongoing work is required, some of which is required for other systems separate from E-2D and CEC.
- Radar track re-labeling was observed in DT, but the full magnitude of the problem only manifested itself under the conditions of IOT&E.

E-3 Airborne Warning and Control System (AWACS) Block 40/45 Upgrade

The Air Force conducted a 24-flight IOT&E operating from the E-3 main operating base, Tinker Air Force Base, Oklahoma City, Oklahoma, between March and June 2012. The two operational Block 40/45 E-3 aircraft participated in several large force exercises. The test included flights working with assets from all four Services in training areas on both coasts as well as over land. The Block 40/45 AWACS was not ready to enter IOT&E, in addition to aircrews and maintainers not having representative training.

- The mission planning system and mission computing start-up checklist were never tested in DT&E and were used for the first time in IOT&E.
- The system was designed to the interoperability standards in place when the development contract was written. The aircraft does not provide Link 16 capabilities that are equivalent to the legacy Block 30/35 it replaces. Many of the tactical datalink deficiencies were caused by the Air Force not modifying the system design to reflect changes in interoperability standards during Block 40/45 development. The satellite communications terminal did not provide an operationally useful capability to receive digital information.

Joint Mission Planning System – Air Force (JMPS-AF) Mission Planning Environment (MPE) E-8

The Air Force paused the IOT&E of the E-8 MPE, the representative test platform for JMPS-AF Increment IV, in September 2011 to allow the Program Office to develop and integrate corrective actions to deficiencies identified during OT. Following additional development and regression testing, the Air Force certified E-8 MPE version 1.3 ready for resumed OT. The Air Force intends to re-execute the entire IOT&E in early FY13. DOT&E's assessment of the paused IOT&E noted significant deficiencies that were not identified during DT&E:

- The time needed for E-8 MPE software installation was lengthy, due in large part to anomalies in the software functionality and installation process
- Threat database information was not easily accessible or usable; training for intelligence specialists was inadequate
- Inability to transfer mission plans to the aircraft
- Critical calculation errors of the magnetic variation for user-specified waypoints
- Could not plan missions with in-flight delays

Joint Tactical Radio System (JTRS) Handheld, Manpack, and Small Form Fit (HMS) Manpack Radio

Although the DASD(DT&E) AOTR stated the Manpack radio was not sufficiently mature to enter the planned Multi-Service Operational Test and Evaluation (MOT&E), the Army proceeded to conduct the test as a part of the Network Integration Evaluation (NIE) 12.2. DOT&E assessed the Manpack as not operationally effective due to the poor performance of the Single Channel Ground and Airborne Radio System (SINCGARS) waveform and not operationally suitable due to a failure to meet reliability or availability requirements. The Manpack radio AOTR had outlined these major MOT&E deficiencies prior to OT. In September 2012, the Army conducted a Government Development Test (GDT) 3 to demonstrate improvements in

MOT&E deficiencies. During GDT 3, the Manpack radio demonstrated:

- Improved performance of the SINCGARS waveform that met requirements of mounted and dismounted transmission range, voice quality, and call completion rates under benign conditions of developmental test.
- Poor reliability with the Solider Radio Waveform (SRW) waveform demonstrating 177 hours Mean Time Between Essential Function Failure compared to the Manpack radio requirement of 477 hours. This translates to a 66 percent chance of completing a 72-hour mission compared to a requirement of 86 percent.

Joint Tactical Radio System (JTRS) Handheld, Manpack, and Small Form Fit (HMS) Rifleman Radio

From October to November 2011, the Army Test and Evaluation Command conducted the Rifleman Radio IOT&E at White Sands Missile Range, New Mexico, as part of the Army's NIE 12.1. Operational units tested the Rifleman Radio using the Soldier Radio Waveform Network Manager (SRWNM) to plan and load SRW network configurations into the radios. From February through March 2012, the Army conducted the Rifleman Radio GDT 2.3 at the Electronic Proving Ground at Fort Huachuca, Arizona. The Army conducted this GDT to complete DT that the Army should have completed prior to IOT&E. In April 2012, the Army conducted a follow-on developmental test, GDT 2.3a. The Army used this follow-on event to confirm fixes to deficiencies observed during GDT 2.3.

- The SRWNM was not employed with the Rifleman Radio prior to IOT&E. The poor performance of the SRWNM adversely affected the performance of the Rifleman Radio.
- The software version used in the Rifleman Radio for IOT&E was not the final version to include all the security features required by the National Security Agency (NSA) certification. The NSA requirements updated software caused numerous essential function failures during GDT 2.3, which followed IOT&E. GDT 2.3 reliability was so poor that the Army executed a GDT 2.3a to reassess DT reliability with installed security fixes. If the DT had been conducted prior to IOT&E, the Army would have produced a more reliable radio for operational test.
- Problems with reliability, range, battery life, and thermal characteristics were found in early OT.
- Prior to the IOT&E, problems with the communications security retention battery would have negatively affected suitability.
- Post-IOT&E, additional problems were found with the Rifleman Radio including spontaneous self-initiated shutdown, failures to transmit and receive, and the SRW network not healing in a timely manner after radios that had separated from the network rejoined. These deficiencies have been fixed and demonstrated in DT.
- All deficiencies have been shown to be fixed or improving (reliability still not met) but should still be confirmed in a formal GDT prior to the competitive IOT&E-2.

Key Management Infrastructure (KMI) Increment 2

The Joint Interoperability Test Command conducted an IOT&E from July until August 2012. The results were a marked improvement over previous operational assessments; however, there were still several operational effectiveness and suitability problems uncovered during the testing event that must be corrected before continued deployment. The KMI program and vendor regression testing of software was problematic and inconsistent. Lacking thorough regression, software fixes in newer releases often broke previously functioning components.

- OT identified some problems that were missed by DT, including problems with Electronic Key Management System (EKMS) to KMI transition, High Assurance Internet Protocol Encryptor (KG-250) configuration, virtual private network establishment, and data error handling. The developmental test environment was initially limited because of no operational data from the legacy system; however, this has now been corrected.
- The transition process from EKMS to KMI functioned in DT, but was inadequate once implemented in the operational environment on live networks. The controlled test environment did not account for multiple network configuration; and therefore, the test team was forced to perform rapid diagnosis, on-the-fly troubleshooting, and resolution as the OT&E was underway.

Mine Resistant Ambush Protected (MRAP) Caiman Multi-Terrain Vehicle (CMTV)

Another major capability insertion during FY12 included the Independent Suspension System for the CMTV. Endurance testing of the CMTV is ongoing at Yuma Proving Ground, Arizona, in all conditions.

- Based on performance during DT, the CMTV cannot stop following sustained operations in muddy terrain. The program suspended DT until the program identifies and implements a materiel solution to fix the brake system.
- The CMTV experienced problems associated with air conditioner, tire, and cab mount cracking failures.

Mine Resistant Ambush Protected (MRAP) Dash Ambulance

The MRAP program continues to acquire and test enhanced capabilities to integrate across the MRAP family of vehicles. In FY12, a major capability insertion included the ambulance kits for the Navistar Dash. The Dash Ambulance is not operationally effective and not operationally suitable because of the deficiencies listed below:

- The patient compartment of the vehicle is small and the litter births are not long enough to safely accommodate litter patients taller than 5 feet 11 inches. A unit equipped with the Dash Ambulance cannot provide safe emergency medical care and transport for tall casualties in close proximity to enemy forces. This problem should have been corrected prior to the Limited User Test (LUT).
- The small interior of the Dash Ambulance does not provide sufficient space for medical equipment and inhibits the ability

of the medic to maneuver within the compartment to properly treat patients.

Miniature Air-Launched Decoy (MALD) and Jammer (MALD-J)
The MALD variant (without the jammer) completed IOT&E in 2011 and was found operationally effective for combat, but not operationally suitable due to poor materiel reliability. In July 2011, the Air Force identified a fault with the missile's radio frequency connector that caused it to separate from the missile during long-endurance carriage flights. The Air Force has repaired the fault and conducted further reliability testing; however, MALD's operational reliability of 78 percent remains below the 93 percent threshold requirement. The Air Force began IOT&E for the MALD-J variant in August 2012.

MV-22 Osprey
The Navy conducted Follow-On Operational Test and Evaluation (FOT&E) in June 2012 of the latest Block C software and six other minor enhancements.

- The Traffic Advisory System (TAS) became saturated during formation flight, preventing the display of potentially hazardous traffic external to the mission aircraft. Intended to warn pilots of impending collision with approaching aircraft, the TAS does not distinguish between approaching aircraft and aircraft in formation. Additional development is needed to address operational test findings and improve the utility of TAS for the MV-22 fleet.

Standard Missile-6 (SM-6)
The Navy completed SM-6 Phase 2 IOT&E in July 2012. Phase 2 was an extensive modeling and simulation effort that examined SM-6 battlespace not covered in the flight tests completed in July 2011. As discussed last year, there were two classified performance anomalies in the flight test portion of the IOT&E that a more rigorous DT&E should have discovered earlier.

- The Phase 2 modeling and simulation trials confirmed the classified performance deficiency observed in flight test. The Navy is exploring corrective actions; however, implementation and testing of these corrective actions are not scheduled.
- The uplink/downlink antenna debris anomaly was discovered during DT and carried forward to IOT&E without corrective action being fully implemented on all missiles; thus, there were additional occurrences during IOT&E. The Navy conducted high-temperature wind tunnel tests, which examined if changes to the antenna sealant material and insulation bonding manufacturing process would eliminate the debris. The trials recorded no anomalies against these fixes; however, the unexpected discovery of insulation inter-layer delamination on three of five wind tunnel test articles raises questions regarding the efficacy of the Navy's corrective actions.
- First observed in DT, the Mk 54 Safe-Arm Device anomaly carried forward into IOT&E with additional occurrences. While initially viewed as anomalous, there is not enough evidence at this time to determine whether the Mk 54 behavior, as seen in testing, has a connection to the burst mode of the SM-6. However, the Phase 2 modeling and simulation trials confirmed that the missile lethality is sensitive to the combination of the burst mode, target, and engagement conditions.

***Virginia* Class Submarine Modernized with the APB-09 Acoustic Rapid Commercial Off-the Shelf (COTS) Insertion (A-RCI) Sonar System and AN/BYG-1 Combat Control System**

- A series of *Virginia* class FOT&E events examined the mission performance changes as a result of the modernization of the sonar and combat control system. These tests were combined with the operational evaluations of the latest variants of the A-RCI Sonar System, the AN/BYG-1 Combat Control System, and the Mk 48 Advanced Capability torpedo. One of the primary focus areas of the new combat control system software was the improvement of the Wide Aperture Array's processing and displays for the operators.
- The Wide Aperture Array demonstrated poor performance during the OT period, and operators chose not to use it to aid in completing their missions. The Navy investigated the problems after the OT period was complete, developed new software fixes, and fielded the new software following some limited DT. No OT has been completed to evaluate the new software or the effects on mission performance.
- These problems are recurring and likely a result of the Navy's time-based process for upgrading electronics systems.
- Many other systems on the *Virginia* class submarine exhibited the same failure modes in FOT&E as in IOT&E.

Warfighter Information Network – Tactical (WIN-T) Increment 2
In May 2012, the Army conducted the WIN-T Increment 2 IOT&E at Fort Bliss, Texas; White Sands Missile Range, New Mexico; Fort Campbell, Kentucky; Fort Riley, Kansas; and Fort Gordon, Georgia. DOT&E assessed the WIN-T Increment 2 as supportive of voice, video, and data communications at-the-halt and on-the-move. However, the network needs improvement in the following areas:

- Reliability
- Stability of the terrestrial Highband Networking Waveform network to support on-the-move communications
- Performance of the Soldier Network Extension
- Information Assurance

PROBLEMS DISCOVERED DURING EARLY TESTING THAT, IF NOT CORRECTED, COULD ADVERSELY AFFECT MY ASSESSMENT OF OPERATIONAL EFFECTIVENESS, SUITABILITY, AND SURVIVABILITY DURING INITIAL OPERATIONAL TEST AND EVALUATION (CONDUCTED WITHIN THE NEXT TWO YEARS)

DISCOVERIES IN EARLY TESTING IN FY12 THAT SHOULD BE CORRECTED PRIOR TO IOT&E	
Bradley Engineering Change Proposal (ECP)	Littoral Combat Ship (LCS) Increment 2
F-15E Radar Modernization Program (RMP)	Multi-Static Active Coherent (MAC) System
Joint Standoff Weapon (JSOW) C-1	Patriot Advanced Capability-3 (PAC-3)

Bradley Engineering Change Proposal (ECP)

In September 2012, the Army conducted two underbody blast tests at the Aberdeen Test Center on the M2A3 Infantry Fighting Vehicle with ECP1 components to characterize the system's vulnerability.

- Severe vehicle and occupant vulnerabilities were observed during early testing. If these vulnerabilities are not corrected the system will likely be assessed as not survivable against realistic underbody threats.

F-15E Radar Modernization Program (RMP)

F-15E RMP developmental flight testing began in January 2011 and IOT&E was expected to begin in late FY12. The planned FY12 IOT&E start did not occur due to challenges in maturing system software to meet the user's functional requirements.

- Software stability is crucial to operational effectiveness and suitability. However, the program experienced software maturation challenges and was unable to complete DT in 2012. Unanticipated software performance shortfalls led to multiple radar software releases and associated regression testing to mature radar mode functionality. At the end of FY12, RMP performance had not yet met the user's requirements. Achieving the Air Force RMP software stability requirement by IOT&E may not be feasible.

Joint Standoff Weapon (JSOW) C-1

The Navy completed DT and initiated integrated testing of the AGM-154C-1 JSOW variant during FY12. The JSOW C-1 integrated testing completed in early FY13, with OT to begin in mid-FY13.

- JSOW C-1 reliability is well below the threshold primarily because of software-driven problems. Achieving an adequate assessment of Mean Flight Hour between Operational Mission Failure during OT is an area of high risk.
- The pilot-vehicle interface is excessively complicated and could prevent successful mission execution.

Littoral Combat Ship (LCS)

The Navy conducted shore-based testing of the MH-60S Block 2 Airborne Mine Countermeasures System, which is intended to support LCS mine countermeasures. Additionally, the Navy commenced a Quick Reaction Assessment (QRA) of the gun systems on LCS 1. Testing indicated shortfalls in performance:

- The Navy determined the MH-60S helicopter cannot safely tow the AN/AQS-20A Sonar Mine Detecting Set (AQS-20A) or the Organic Airborne Sweep and Influence System because the helicopter is underpowered for these operations. The MH-60S helicopter will no longer be assigned these missions operating from any ship, including LCS.
- Preliminary evaluation of test data collected during the operational assessment (OA) of the MH-60S Block 2 Airborne Laser Mine Detection System indicates that the system does not meet Navy requirements for False Classification Density and has low reliability.
- Results from the QRA of the LCS gun systems revealed performance, reliability, and operator training deficiencies for both the 30 mm and 57 mm guns.

Multi-Static Active Coherent (MAC) System

The Navy conducted DT in 2012 and plans to begin OT in early FY13.

- No significant problems have been observed in DT to date; however, little realistic DT has been conducted, and the test construct used for DT contained target requirements that may support model verification but were not operationally realistic or translatable to operationally realistic conditions. The Navy plans to waive two known problems that will likely affect mission performance.

Patriot Advanced Capability-3 (PAC-3)

The Army completed DT of the Post-Deployment Build-7 (PDB-7) and began a LUT operational test in FY12.

- Data analysis is ongoing, but preliminary results indicate that Patriot training remains inadequate to prepare operators for complex Patriot engagements. This was true during the PDB-6.5 and PDB-6 LUTs as well. This problem was exacerbated in the PDB-7 LUT because many of the experienced Patriot operators in the test unit were understandably transferred to deploying units prior to the LUT, resulting in many inexperienced users and a high variability in Soldier proficiency across the test unit.

- The Patriot system did not meet its reliability requirements during the PDB-7 DT. DOT&E is investigating the possibility of using field data to improve the estimates of Patriot system reliability such as Mean Time Between Critical Mission Failure. However, critical field data including total operating hours and numbers of critical mission failures for each Patriot battery major end item may not be accurate.

CONCLUSION

Previously, Congress has expressed concerns that significant weapons acquisition program problems are discovered during OT&E that should have been discovered during DT. Last year, I documented 40 systems with significant discovery during OT during 2010-2011; 23 of those systems had discovery in early OT, of which 19 implemented fixes that were either verified by successful IOT&E or are currently in IOT&E. Of the 17 programs that discovered significant issues during their IOT&E in 2010-2011, 12 have implemented fixes that were either verified in successful FOT&E or are planning additional OT periods; 2 of the remaining 5 programs were cancelled. Thus, while significant issues are being discovered late in the programs' acquisition cycle, most programs are addressing the discoveries and verifying fixes in FOT&E. In 2012, 17 programs had significant discoveries in IOT&E or FOT&E, while 7 programs had significant discovery in early testing.