




ARMY DEVELOPMENTAL AND OPERATIONAL TEST PLAN REVIEW PROCESS

Dal M. Nett
Safety Director
US Army Test and Evaluation Command (ATEC)
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ARMY TEST AND EVALUATION COMMAND




AGENDA

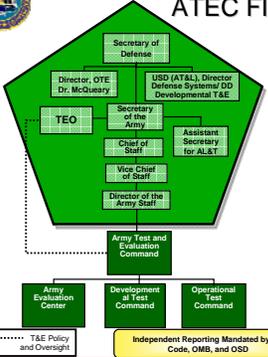
- ATEC/DTC/OTC
- DT 101
 - What is Developmental Testing?
 - Why we have Developmental Testing?
 - Where and What we Test?
 - Who are the Key DTC Players and who do they Interface with?
 - What is the Test Planning/Review Process?
 - Important Documentation Supporting DT
 - DT Outputs
- What about Operational Testing?
- Test Safety Planning Process
- Safety Verification and Test Safety Process Consolidation
- Summary

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How Does ATEC FIT IN?



Plan, test, independently evaluate, and report throughout program lifecycles to advise combat developers, PEOs, and Senior Leadership

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Developmental Testing

What:

“Developmental Testing is the verification and validation [portion] of the systems engineering process and must provide confidence that the system design solution is on track to satisfy the desired capabilities.”

- Department of Defense Acquisition Guidebook, section 9.3.1.

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Developmental Testing

What:

- Requires instrumentation and measurements
- Uses controlled and calibrated facilities and test ranges
- Accomplished by engineers, technicians, with support from soldier/user personnel
- Conducted on components, subsystems, systems, and system-of-systems
- Verifiable, repeatable, and statistically valid
- Conducted throughout the system's life cycle
- Conducted by contractor and/or Government

DT - My responsibility as PM and my tool to ensure I get what I pay for.

Measure to learn why it doesn't work, and how to fix it.

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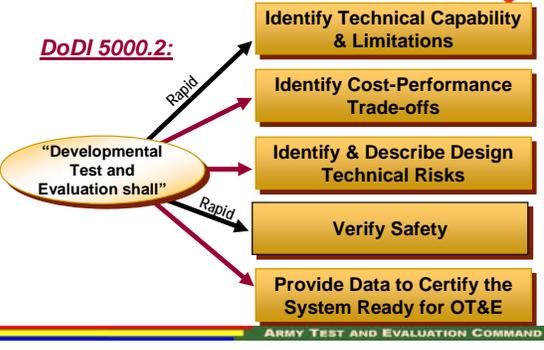
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DEVELOPMENTAL TESTING

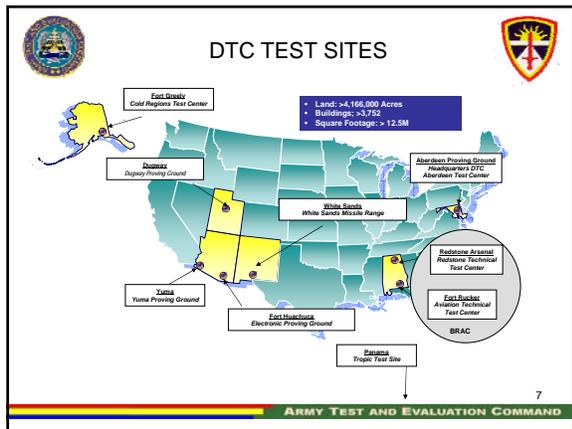
WHY

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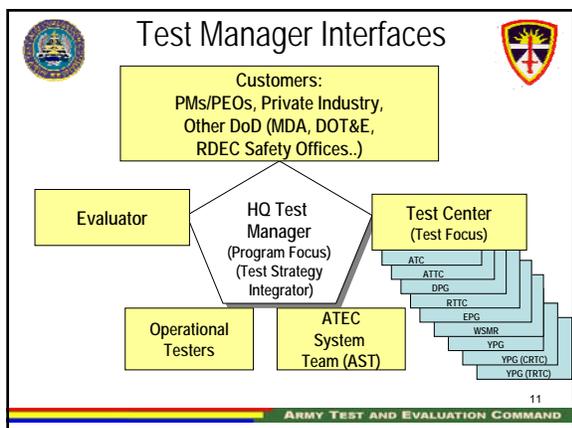
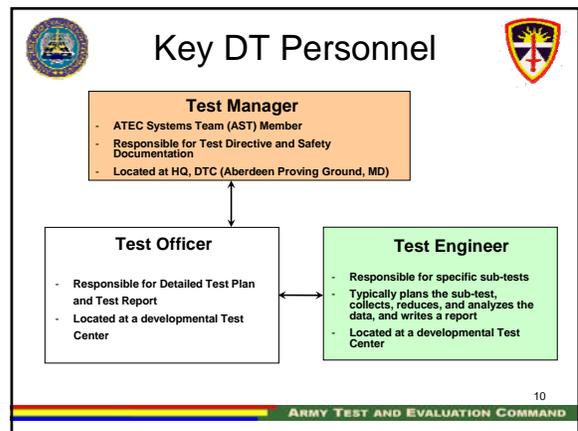


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- ### Technical Disciplines (not all inclusive)
- Shock and Vibration
 - Acoustics
 - E3 (Electromagnetic Environmental Effects)
 - Materials Analysis/ Failure Analysis
 - Non-destructive Testing
 - Software Testing
 - Control Systems Theory
 - Power Engineering
 - Information Assurance
 - Combustion Chemistry
 - Fluid Dynamics
 - Thermodynamics
 - Temporal Analysis
 - TSPI (Time Space Position Info)
 - Flight Dynamics
 - Interior Ballistics
 - Exterior Ballistics
 - Terminal Ballistics
 - Toxic Fumes
 - Physiological Measurements
 - Human Factors
 - Electromagnetic Interference
 - Optics
 - Imaging through the Atmosphere
 - Multi-spectral Imaging
 - Image Processing
 - Chemical Defense
 - Biological Defense
 - Meteorology
 - Network and Communications Theory
 - Synergistic Effects
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- ### Detailed Test Planning
- Test directive issued by HQ, DTC
 - Refined test requirements
 - Final identification & coordination of resources
 - Detailed Test Plan developed
 - Identify appropriate Test Operating Procedures (TOPs), International TOPs, STANAGs or other standardized procedures
 - Developmental Test Readiness Review (DTRR) will be conducted in conjunction with PM
 - If Soldiers are required, Outline Test Plan must be generated for submission to Test Schedule and Review Committee (TSARC)
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Detailed Test Plan Content



DT Detailed Test Plan provides:

- System Description
- Authority to test
- Test breakdown
- Procedures
- Instrumentation Requirements
- Data Requirements

GOAL: DT NEEDS TO BE REPEATABLE!

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Required Documentation



- **Safety Assessment Report (SAR)** – PM provides
- Security Classification Guide – PM provides
- Record of Environmental Consideration (REC) – when applicable
- **Health Hazard Assessment (HHA)** – Prepared by the US Army Center for Health Promotion and Preventive Medicine (CHPPM) at the PM's request
- ADSS Project number
- Test Directive from HQ, DTC
- Detailed Test Plan - HQ, DTC approved

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Safety Assessment Report



- Formal summary of safety and health data collected during design development
- Includes HHA (if available)
- Provided by the PM/Contractor
- To be provided 60 days prior to the start of DT testing
 - **Facilitates test center SOP preparation**
 - **Provides focus to safety testing**

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HEALTH HAZARD ASSESSMENT (HHA)



- The application of biomedical and psychological knowledge and principles to identify, evaluate, and control the risk to the health and effectiveness of personnel who test, use, or service Army systems.
- Prepared by the US Army Center for Health Promotion and Preventive Medicine (CHPPM) at customer request.
- Based on the following:
 - User provided data
 - Previous testing
 - CHPPM supporting studies (Ionizing/Non-Ionizing radiation, toxic fumes, etc.)

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DT Test Execution Concerns



- Documenting departures from Test Plan
 - **Departures from Detailed Test Plan (DTP) must be approved by HQ, DTC**
- Monitor Test Data, perform failure mode analysis and modify procedures if needed
- Effective use of Test Center resources
 - **Competition for resources**
 - **Need flexibility**
- Environmental Concerns
- **Safety Requirements**

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DT Output



- **Test Report**
 - **Lasting detailed record of what was done and how**
- **Safety Release or Safety Confirmation**
 - **Allows troops to use the item for an event or in support of a milestone decision**

OT Entrance Criteria assessed during DT will help determine item readiness for OT

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Test Report

- Organized by sub-tests
- Test Engineers submit sub-test data/analysis as completed to Test Officer
- Test Officer consolidates all sub-test data/analysis into Test Report
- Test Manager staffs and gets approval of Test Report

Report must be written to allow tests to be repeatable

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Safety Release

- A Formal Document issued by DTC to a user/test organization before any hands-on testing, training, use, or maintenance by soldiers.
 - Issued for a specific event
 - At a specified time
 - A specified location
 - Under Specified Conditions
- A standalone document indicating the system is safe for use and maintenance by soldiers.
- Describes the specific hazards of the system based on
 - Test Results
 - Inspections,
 - System Safety Analysis
- Operational limits and precautions are included

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Safety Confirmation

- A Separate Document that provides the Materiel Developer and Decision Maker with DTC safety findings and conclusions
- It supports all Milestones, Type-Classification Materiel Release Decisions, and Fielding
- Provided to the Materiel Developer / PM and AEC for attachment in the System Evaluation Report (SER)
- Provided to Rapid Fielding Initiative (RFI), Rapid Equipping Force (REF), Improvised Explosive Device (IED), Urgent Materiel Release (UMR(PM)) for Global War on Terrorism (GWOT)
- The Safety Confirmation
 - Classifies Residual Hazards (Severity and Probability)
 - Uses the Approved Risk Acceptance Model

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Hazard Rating Categories (MIL-STD-882C)

		HAZARD PROBABILITY				
		FREQUENT	REASONABLY PROBABLE	OCCASIONAL	REMOTE	IMPROBABLE
HAZARD SEVERITY	SPECIFIC INDIVIDUAL ITEM	Likely to occur frequently	Will occur several times in life of the item	Likely to occur sometime in the life of item	Unlikely but possible to occur in the life of an item	So unlikely it can be assumed the occurrence may not be experienced
	FLEET OR INVENTORY	Continuously experienced	Will occur frequently	Will occur several times	Unlikely but can reasonably be expected to occur	Unlikely to occur but possible
		A	B	C	D	E
HAZARD SEVERITY	CATASTROPHIC I May cause death, system loss or severe environmental damage	HIGH	HIGH	HIGH	HIGH	MEDIUM
	CRITICAL II May cause severe injury, severe occupational illness, or major system damage	HIGH	HIGH	HIGH	MEDIUM	LOW
	MARGINAL III May cause minor injury, minor occupational illness, or minor system damage	HIGH	MEDIUM	MEDIUM	LOW	LOW
	NEGLECTIBLE IV May cause less than minor injury, occupational illness, system damage or environmental damage	MEDIUM	LOW	LOW	LOW	LOW

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WHAT ABOUT OPERATIONAL TESTING?

- What is the Operational Test Command (OTC)?
- Organization and Scope
- How are Operational Test Plans developed and reviewed?

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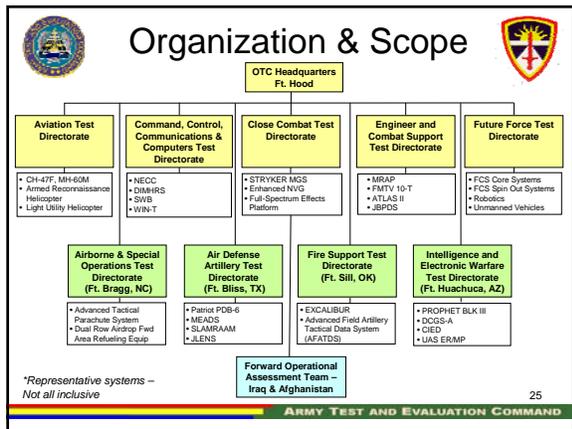
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WHAT IS OTC

- Mission: Plan, conduct and report rigorous operational tests, assessments and experiments in order to provide essential information for the acquisition and fielding of Warfighting systems.
- Operational tests are required by law (Title 10, USC, Sec. 139 for major systems) or by Army policy and prove that these new systems work and how they can be improved. The data collected provides significant information to Army decision-makers on key systems and concepts.

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OTC EVENT DESIGN PLANS (EDPs)

- EDPs are used to document details of event planning and execution requirements to gain approval to conduct an OT event
- EDPs are required for most events conducted by OTC.
- EDPs include introduction, event description, analytical methodology and data management sections.
- EDPs are staffed throughout OTC and with other ATEC organizations that make up the ATEC System Team (AST) in support of the project.
- The OTC Safety Manager assists in the identification of requirements for and completion of risk management programs and assessments for OTC events.

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OPERATIONAL TEST READINESS REVIEWS (OTRRs)

- All OTs go through 3 Operational Test Readiness Reviews (OTRRs) at the T-270, T-60 and T-1 times.
- OTRRs are conducted to allow the Tester and Evaluator to assess the overall readiness of a system for test.
- Participants normally include the Operational Tester, the Evaluator, the Material Developer, the Combat Developer, the Training Developer, the Developmental Tester, the Logistician, the Player Unit Rep. HQDA Staff Elements, the Host Installation and the System Contractor
- A Safety Release and a HUC Determination are both required prior to the commencement of an OT.

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TEST SAFETY PLANNING PROCESS

- Required by:
 - DOD, DA and ATEC Safety Regulations
 - OSHA
- Program Application consolidates:
 - Firm compliance with specific statutory and regulatory requirements
 - Risk based programs tailored to meet specific safety and occupational health challenges posed by individual tests

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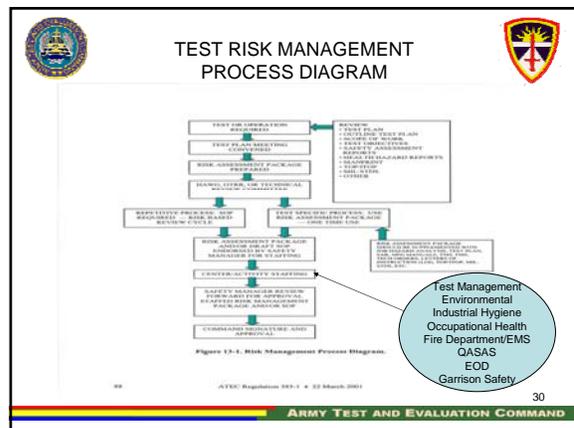
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CRITICAL TEST SAFETY PROGRAM COMPONENTS

- **Policy**
 - Policy Letters, Regulations, SOPs
 - Legal and Regulatory Compliance
 - Leadership Expectations/Emphasis
- **Safety Promotion (Awareness-Enhancement)**
 - Organizational safety culture and climate
 - Continual Safety Awareness
- **Personnel**
 - Proper Qualifications, training and certification
 - Appropriate physical capabilities (OH)
 - Proper Attitude
 - Wellness
 - Accountability and Recognition
- **Planning and Oversight**
 - Composite Risk Management Application
 - Hazard Identification and Analysis (HAWG)
 - Risk Mitigation/Control
 - Risk Acceptance
 - Operational Control
 - Safety Engineering
 - Properly designed and well maintained facilities and equipment.
 - Facility and Operations Oversight
 - Employees, Supervisors, Support Staff, External
- **Accident Reporting, Investigation and Analysis, Countermeasure Development and Information Sharing**

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TEST RISK ASSESSMENT MATRIX

		HAZARD PROBABILITY				
		INFREQUENT	MODERATELY INFREQUENT	FREQUENT	VERY FREQUENT	CONTINUOUS
HAZARD SEVERITY	I CATASTROPHIC (LOSS OF SYSTEMS)	EXTREMELY HIGH	HIGH	MEDIUM	LOW	
	II CRITICAL (LOSS OF FUNCTION OR MAJOR SYSTEMS)		EXTREMELY HIGH	HIGH	MEDIUM	LOW
	III MODERATE (LOSS OF FUNCTION)			EXTREMELY HIGH	HIGH	MEDIUM
	IV NEGLIGIBLE (LOSS OF FUNCTION)				EXTREMELY HIGH	HIGH

13-6. Approval procedures.
 a. Process risk management packages and/or SOPs will be approved in accordance with the following guidance:
 (1) Extremely high hazard processes are unacceptable from a test operational standpoint and will be reduced to a lower classification through redesign, process modifications or controls or not approved.
 (2) High hazard processes will require approval by the test center activity commander prior to commencing operation or test. Copies of high hazard approval correspondence will be provided to the appropriate subordinate command for information.
 (3) Medium or low hazard processes require approval by the test center/activity command group (commander, deputy commander, technical director, etc.) prior to commencing operation or test.

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SAFETY VERIFICATION AND TEST SAFETY PROCESS CONSOLIDATION

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    graph TD
      SV[Safety Verification] --> SR[Safety Release And HUC Determination  
(Required for Non-SOMTE Troop Participation in DT or OT)]
      CI((Common Inputs  
Test Objectives  
SAR  
HHAR  
TOPs/ITOPs/STANAGs)) --> SR
      CI --> TSP[Test Safety Planning]
      SR --> TSP
  
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SUMMARY

- ATEC, through DTC, is charged by assigned mission to verify the safety of Army systems/items
- ATEC, through OTC, is required by law to conduct operational testing for major systems
- All ATEC organizations are required by law and regulation to ensure the safety and health of its workforce and supporting test participants
- The planning process for both safety verification and test safety involve sharing of available data and multiple reviews by functional experts and Leaders
- All Soldiers benefit from the success of ATEC's safety verification program and the ATEC workforce benefits from the success of the test safety program. Both groups deserve the best efforts we can provide!

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