ARMY DEVELOPMENTAL AND OPERATIONAL TEST PLAN REVIEW PROCESS

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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

How Does ATEC FIT IN?

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

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

DEVELOPMENTAL TESTING

DoDI 5000.2:

- Identify Technical Capability & Limitations
- Identify Cost-Performance Trade-offs
- Identify & Describe Design Technical Risks
- Verify Safety
- Provide Data to Certify the System Ready for OT&E

“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.
DTC TEST SITES

Army System Commodity Areas

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
- TSP (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

Key DT Personnel

Test Manager
- ATEC Systems Team (AST) Member
- Located at HQ, DTC (Aberdeen Proving Ground, MD)

Test Officer
- Responsible for Detailed Test Plan and Test Report
- Located at a developmental Test Center

Test Engineer
- Responsible for specific sub-tests
- Typically plans the sub-test, collects, reduces, and analyzes the data, and writes a report
- Located at a developmental Test Center

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)
**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**
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

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

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 Material 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

Hazard Rating Categories (MIL-STD-882C)

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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?

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.
Organization & Scope

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.

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.

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

CRITICAL TEST SAFETY PROGRAM COMPONENTS

- Policy
  - Policy Letters, Regulations, SOPs
  - Legal and Regulatory Compliance
  - Leadership/Expectations/Emphasis
- Safety Promotion Awareness
  - Operational safety culture and continual safety awareness
- Personnel
  - Proper Qualifications, training and certification
  - Proper physical capabilities (OH)
  - Proper Altitude
  - Wellness
  - Accountability and Recognition
- Planning and Oversight
  - Continuous Risk Management Process
  - Safety Engineering
  - Adequate Emergency Planning
- Accident Reporting, Investigation
  - Well-staffed, well-overtiven, well-equipped
- Safety Engineering
  - High impact, high risk, high potential

TEST RISK MANAGEMENT PROCESS DIAGRAM
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!