# Directions in Decontamination Test & Evaluation and the Impact of New CB Contamination Survivability (CBCS) Requirements on Decontamination Systems

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# Directions in Decontamination T&E; Impact of New CBCS Requirements

## Objective:

- To provide information and input for discussion for consideration of CBCS in decontamination programs

# TEMA Organization


**DIRECTOR**
Janet Garber
SES

**CBDP T&E DIVISION**
**Terri Kocher, GS-15**

- Provide CBDP T&E oversight
- CBDP T&E interface with OSD
- Provide T&E expertise to support Defense Acquisition System for CBDP
- Review CBDP POM to ensure adequate T&E funding
- Establish standardized procedures & processes
- Develop and coordinate CBDP T&E infrastructure investment strategy

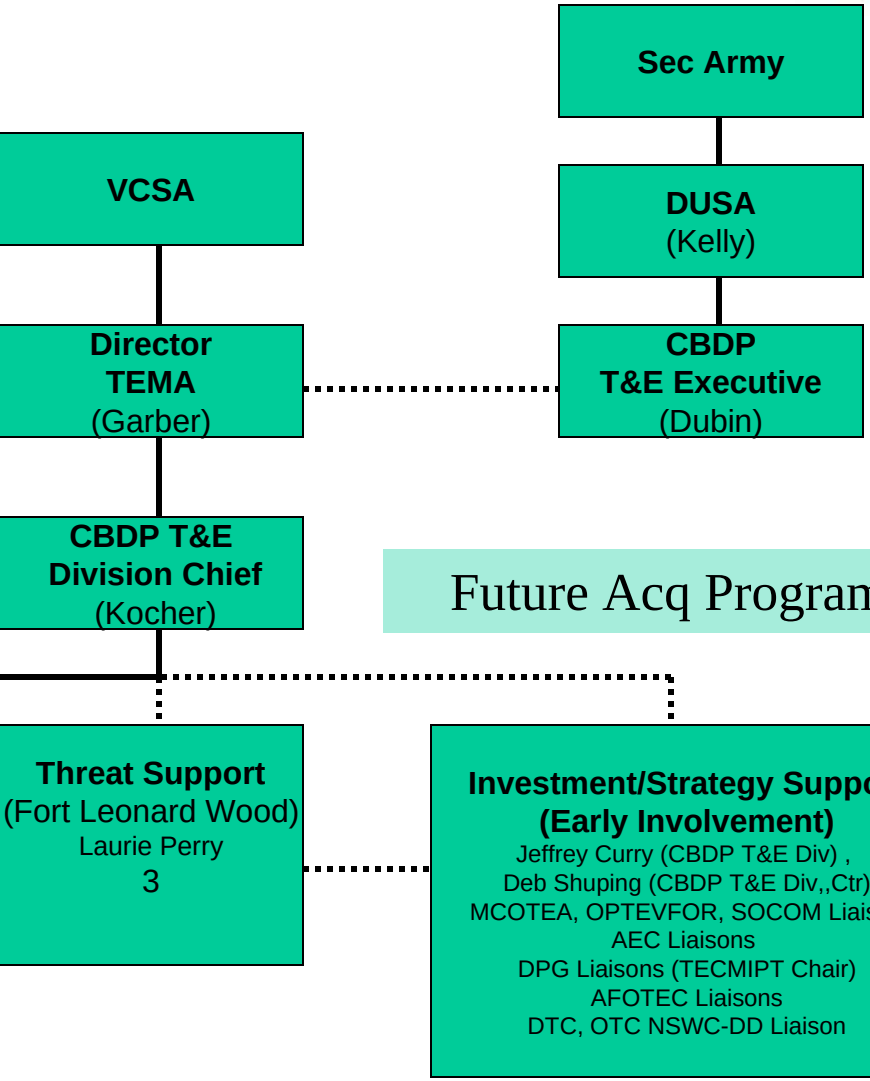
**DEPUTY / POLICY & PROGRAMS DIVISION**
**Larry Leiby, GS-15**

- Develop and promulgate Army T&E policy & procedures
- Provide T&E oversight for <u>all</u> Army programs, less CBDP
- Manage HQDA staffing of all Army test-related documentation
- Principal HQDA T&E interface with OSD
- Provide T&E expertise to support the Defense Acquisition System
- Chair T&E Managers Committee

**RESOURCES DIVISION**
**Scott Henry, GS-15**

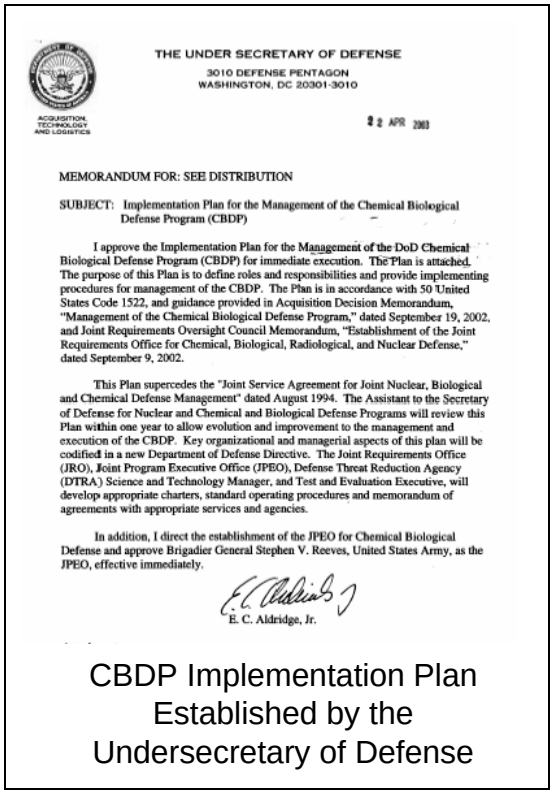
- Develop Army T&E investment strategy through the publication of the annual Army Test Resources Master Plan (ATRMP)
- Develop and validate Army T&E POM input
- Coordinate all T&E resource actions within Army and OSD
- Administer Army portion of CTEIP funding

# CBDP T&E Division



# Mission of the CBDP T&E Executive

- Ensure Adequate and Credible Testing
  - Sufficient testing to support evaluation
  - Ensure credible determination of performance of materiel
- Establish T&E Policy
  - Common practices and standards for CB T&E
  - Policy for CB T&E oversight and issue-resolution procedures
  - Testing policy for DT, OT, combined DT/OT, Joint T&E, MST&E
- Define Required T&E Infrastructure
  - Define T&E capabilities necessary for adequate testing
  - Coordinate T&E Strategies development
  - Ensure availability of required infrastructure for testing events and thorough evaluations
- Advocate for Adequate Funding for T&E
  - POM input to ensure adequacy of T&E funding
  - Early community involvement in planning



THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

ACQUISITION, TECHNOLOGY AND LOGISTICS

2 APR 2003

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Implementation Plan for the Management of the Chemical Biological Defense Program (CBDP)

I approve the Implementation Plan for the Management of the DoD Chemical Biological Defense Program (CBDP) for immediate execution. The Plan is attached. The purpose of this Plan is to define roles and responsibilities and provide implementing procedures for management of the CBDP. The Plan is in accordance with 50 United States Code 1522, and guidance provided in Acquisition Decision Memorandum, "Management of the Chemical Biological Defense Program," dated September 19, 2002, and Joint Requirements Oversight Council Memorandum, "Establishment of the Joint Requirements Office for Chemical, Biological, Radiological, and Nuclear Defense," dated September 9, 2002.

This Plan supercedes the "Joint Service Agreement for Joint Nuclear, Biological and Chemical Defense Management" dated August 1994. The Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs will review this Plan within one year to allow evolution and improvement to the management and execution of the CBDP. Key organizational and managerial aspects of this plan will be codified in a new Department of Defense Directive. The Joint Requirements Office (JRO), Joint Program Executive Office (JPEO), Defense Threat Reduction Agency (DTRA) Science and Technology Manager, and Test and Evaluation Executive, will develop appropriate charters, standard operating procedures and memorandum of agreements with appropriate services and agencies.

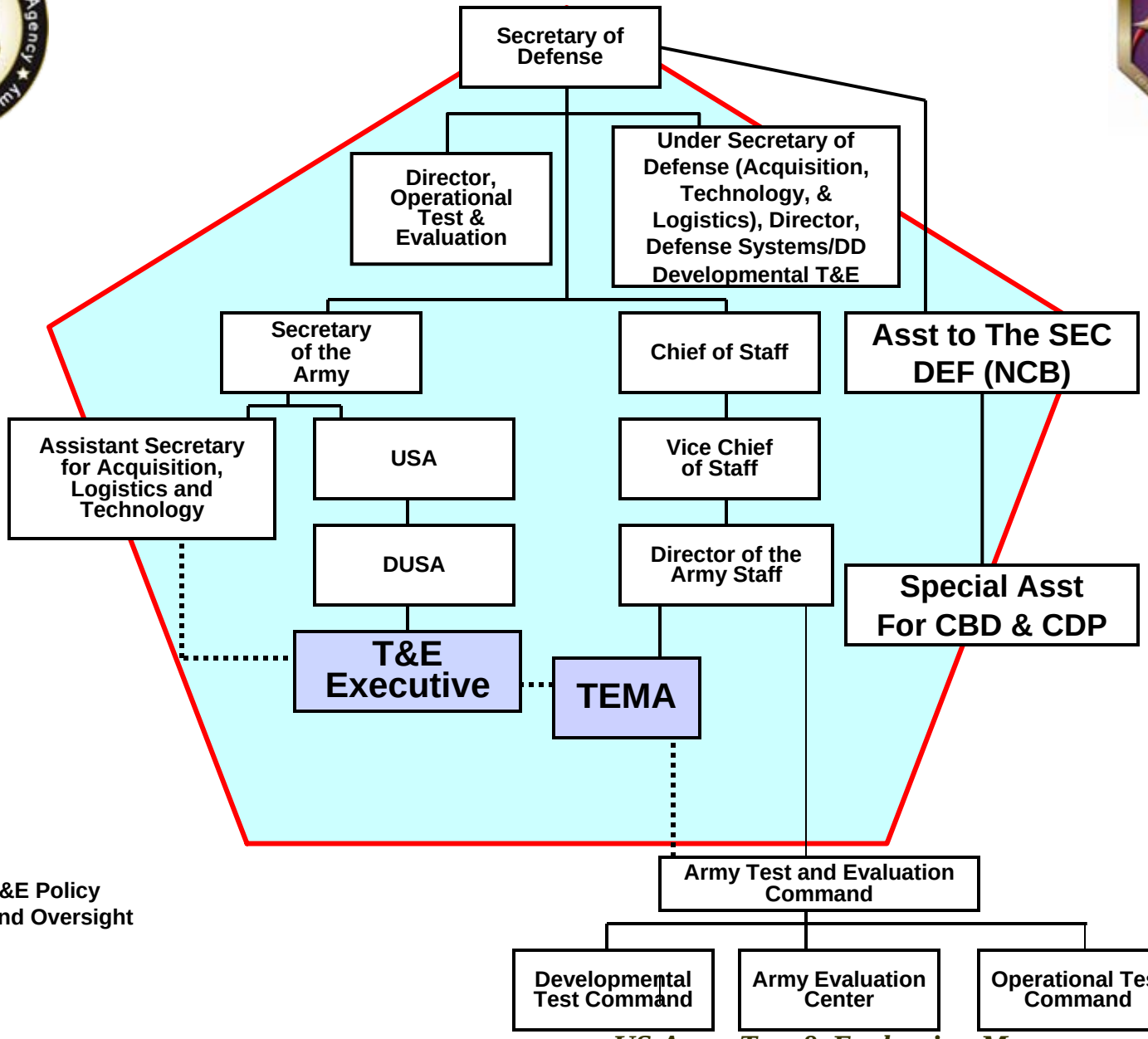
In addition, I direct the establishment of the JPEO for Chemical Biological Defense and approve Brigadier General Stephen V. Reeves, United States Army, as the JPEO, effective immediately.

E. C. Aldridge, Jr.

CBDP Implementation Plan Established by the Undersecretary of Defense

Will be codified in DoDD 5160.05E and DoDI

# Army T&E in OSD Structure



# Directions in Decon T&E

- T&E Standards
  - General: guidance for level and "pedigree" of data required to establish standardized test methods
  - Draft memo out for coordination
  - Specific: Test Operating Procedures (TOPs)
    - Also Multinational TOPs (MTOPs)
      - Australia, Canada, UK, US; other NATO WGs
    - By commodity area, type of test (e.g., Large Item, Small Item Decon)
    - ***Decon TOPs are Key to supporting CBCS testing***

# Directions in Decon T&E
# T&E Standards
# (continued)

- **One key element: Provide Validation Data, Documentation (Plan, Trials, Report)**

- **Levels of adequate data IAW type of test and decision to be supported:**

**TRL 5:** Relevant environment includes agent testing and initial consideration of the simulants required for field testing. Lab tests comprise existing procedures which have been modified for this specific use or system type, with Validation Plan developed and initial trials conducted.

**TRL 6:** Relevant environment includes agent testing and simulants required for field testing identified and characterized, with some initial correlation to agent performance. Lab and field test procedures tests have been validated across range of conditions to be tested, with Validation Report completed and reviewed. M&S complete and validated.

**TRL 7:** Operational environments include agent testing in lab and simulant testing with operators in initial OT. Analysis complete to predict agent system and mission performance based on simulant data. Lab and field test procedures tests have been validated across range of conditions to be tested, with Validation Report completed and reviewed. M&S accredited.

# Directions in Decon T&E (continued)

- Larger than coupon tests (component, subscale)
  - CW and BW agent surety chamber tests
  - Need to present operationally realistic agent challenge(s) **and decon applications/procedures**
  - Need to compile and report results in operationally meaningful terms to give warfighter guidance
  - Systems under test = Decon systems

    **+ those being decontaminated (CBCS)**

# Directions in Decon T&E (continued)

- Future reactive simulants
  - Need to conduct operational testing and training
  - Simulants must react to decontaminants like agents do: when simulant is “decontaminated”,

    → the agent would have been decontaminated
  - Simulants must react to verification means (detectors, M8 paper, others) like agents do:
    - when simulant is “decontaminated”,

      → detector shows no alarm
    - when simulant is not “decontaminated”,

      → detector alarms

# Directions in Decon T&E (continued)

- T&E Modeling and Simulation
  - Need to compile and report results in operationally meaningful terms to give warfighter guidance
  - Need to predict system performance (decon system, CBCS parameters of decontaminated systems) based on chamber panel/component tests and over all environments
- Systems of Systems tests (Simulants, M&S support)

  Decontaminant + Decontamination applicator

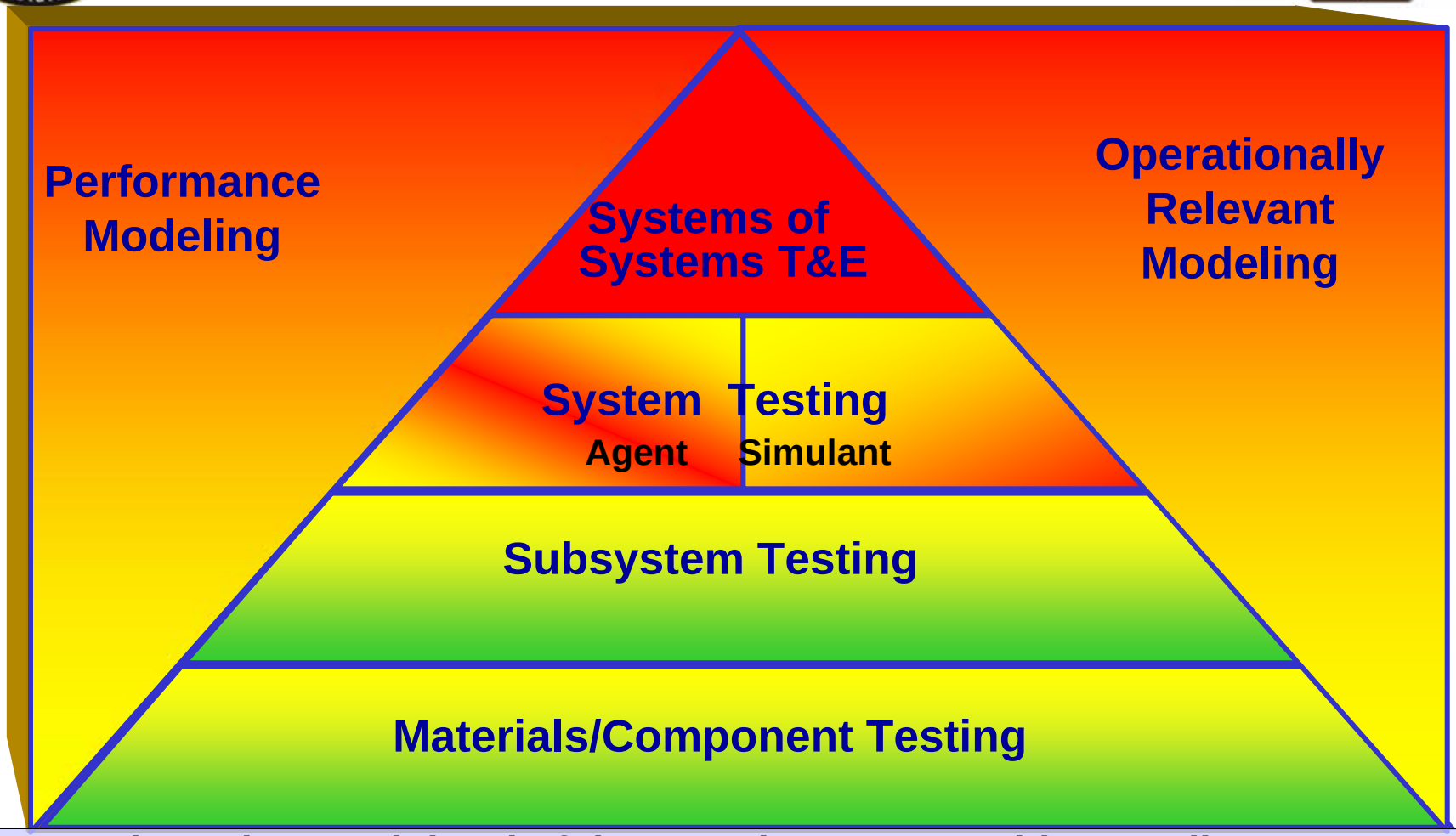
  + Decontamination Procedures + Decontaminated System

  + Detection/Verification System/Processes

  + Decontamination Line to Clean area/Collective Protection System

  + Individual Protection/MOPP Exchange

# Relation of T&E M&S to T&E physical data




**Need to relate each level of data moving up pyramid to predict system performance based on materials/component data and expanded in environments**

# Chemical Biological Contamination Survivability (CBCS) Background

- **NBCCS being supplanted by CBCS as a result of recent events -- same definition**
- **GAO (2003) found:**

  **Higher priority was placed on fielding needed new equipment and a lower priority on CB operational concern**

  **Lack of comprehensive, focused DoD-wide CB defense strategy with prioritized goals and objectives**

  **DoD and service acquisition regulations and processes do not assure CB survivability is part of design and testing**

# CBCS GAO Recommendations

- **Through a single focal point in DoD with sufficient cross departmental authority:**
  - **Develop a comprehensive strategy that defines long-term results oriented goals**
  - **Develop an implementation plan, linked to the strategy that clarifies roles and responsibilities and establishes annual goals and a time table**

# CBCS GAO Recommendations (continued)

- **Establish a systematic approach for ensuring CBCS of mission critical systems that include:**
  - **Determining the degree to which survivability has been incorporated into existing mission critical systems**
  - **Determining and documenting any additional mitigation procedures needed to address system vulnerabilities**
  - **Central testing of commonly used materials and components and processes to ensure that test results are captured and easily accessible and in a current central database**

# CBCS Public Law 108-375 Section 1053 (Oct 04)

- Law based on GAO report
- Law only addressed Chemical and Biological (CB) Contamination Survivability (CS)
- Required
  - Policies for ensuring the survival of Defense Critical Systems
  - A process for determining what systems are Defense Critical
  - **Specific testing procedures to be used during the design and development of new defense critical systems**
  - **A centralized database that contains comprehensive information on the effects of chemical and biological agents and decontaminants on materials used in defense critical systems**

- **CBCS IPT agreed that Defense Critical = Mission Critical**

# CBCS Implementation

- **The Special Assistant to the Secretary of Defense (OSA (CBD and Chem Demil) tasked the Program Analysis and Integration Office (PAIO) to develop a plan to address the GAO concerns and recommendations.**
- **PAIO facilitated a Focus Group that developed a five-task program plan to address GAO findings and recommendations while providing realistic guidance to the Services. Goals include:**
  - **Clear definitions, regulations, and policy that PMs view as doable**
  - **Clear terminology of systems that need to be survivable**
  - **DoD focal point with cross-departmental responsibilities**
  - **A process that enforces acquisition of survivable systems with fewer waivers**

# OSD CBCS
# Policy Development

- **CBCS IPT developed draft policy and submitted for comments in FY 05**
- **Comments adjudicated and policy revised**
- **Returned to Services for comment/concurrence**
- **Policy signed by USD(AT&L) 09 May 06**

- **While staffing policy, several agencies made recommendations**
  - » **Publish a "permanent" policy**
  - » **Include Radiological and Nuclear**

# Draft CBCS DoDI Status

- Now addresses CBRN
- CBCS IPT developed CBRN DoDI
- Posted to DoD Portal June 2007
- Over 200 comments received
- Now in process of adjudicating comments

- Next Steps
  - Incorporate comments
  - Restaff DoDI

# OSD Plan to support CBCS Implementation and Policy

| TASKS | SUMMARY |
|---|---|
| **Task 1:** Development of Definitions, Policies, and Procedures | This task will develop a clear and effective wording on how CBCS should be addressed per Joint Service Instructions and DoD guidance, and a mechanism for ensuring that the CBCS requirement is appropriate to the system or materiel in development—all applicable across all Services. This task consists of 3 Subtasks. |
| **Task 2:** CBCS Analysis and Test Support | This task will develop a process for determining the testing/assessment/modeling and simulation of development systems. This task consists of 6 Subtasks. |
| **Task 3:** CBCS Support Plan to OSD/Services/PEOs/JPEOs | This task will develop a plan that will provide assistance to DoD staff and Services in responding to Congressional inquiries and IG/GAO audits on CBCS. This task consists of 1 Subtask. |
| **Task 4:** CB Materials Effects Database | This task will provide funding to correct deficiencies identified with the CDMD, managed by the CBIAC. This task consists of 3 Subtasks. |
| **Task 5:** Development of Oversight Process of Joint Service CBCS Program | This task will define the process for DoD and the Services to integrate systematic oversight of NBCCS policies with execution of CBCS requirements in the acquisition process. This task consists of 2 Subtasks. |

# CBCS Plan T&E Task 2 Subtasks

- Subtask 1 - Develop process for determining if system or subsystem needs CBCS assessment/testing
- Subtask 2 - Develop specific test methods (New TOPs linked to requirements and reflective of future environment)
- Subtask 3 - Develop a process to determine specific tests or assessments required
- Subtask 4 - Develop needed output/data from test/assessment evaluation report
- Subtask 5 - Develop process for ensuring accountability of recommendations
- Subtask 6 – Develop educational materials

# Impact of New CBCS Requirements

- **Expect CBCS workload to increase because policy applies to all systems that are mission critical → *fewer waivers granted***
- **PMs for mission critical systems need CB SME on team to establish decontaminable/CBCS design approaches and to identify decon systems, procedures to be used**
- **Backlogs possible in CBCS test facilities**
- **Annual reports required to OSD dealing with CBCS of those systems in the JCIDS process**
- **Focus on test selection: identify critical materials/ components of systems that fail the system → Prioritize CBCS materials/components testing vice whole system tests**
  **→ Need T&E M&S to "roll up" component results to full system CBCS guidance**
  **→*Increased emphasis on modeling and simulation (M&S)***
- **Current Database inadequate → limited info available to non CB system designers**
- **Critical to incorporate knowledge and technology gaps for CBCS into CBDP S&T program**
  **→ T&E collaboration critical to support**
- **Development of new test methods required for new decon approaches**

# Summary

- Recommend CB Decon SMEs reach out to non CB programs to aid early CBCS planning
- Agent and decon surface/material interactions are key knowledge gaps for S&T
- T&E methods for Decon Systems also support CBCS testing of non CB systems
- ***<u>Validated, repeatable T&E methods and ability to provide operationally relevant results:  key to successful CBCS of our forces!</u>***

# Backup

# Chemical Biological Contamination Survivability (CBCS)

- **Nuclear, Biological, Chemical Contamination Survivability (NBCCS) is a Long-Standing Requirement**
  - **Definition: The capability of a system (and its crew) to withstand a Nuclear, Biological, and Chemical Contaminated (NBCC) environment and relevant decontamination without losing the ability to accomplish the assigned mission. An NBCC survivable system is hardened against NBCC and decontaminates; it can be decontaminated, and is compatible with individual protection equipment. (Ref. DAU Glossary)**

# CBCS T&E Subtask 1

- **Develop process for determining if system or subsystem needs CBCS assessment/testing or both. (Based upon JCIDS/OSD Determination of the system being a Defense Critical System)**
- **Objectives:**
  - Draft decision tree
  - Staff with Test Subject Matter Experts
  - Incorporate changes
  - Brief to Steering Committee for approval
- **Product:**
  - A user friendly decision tree for use by PMs that will determine process for CBCS assessment/testing

**Status:** Complete

# CBCS T&E Subtask 2

- **Establish range of test parameters (challenge environments) based on the IDA CB Challenge study results and available decontamination concepts which can be used in defining CBCS requirements and test scopes for CB and non-CB systems**
- **Objective:**
  - Link challenge levels to testing procedures in the TOPs
  - Provide mechanism to determine challenge levels (no more 1 number)
- **Product:**
  - IDA Chemical Challenge results/spreadsheet: process to determine appropriate challenge levels based on system use, expected threats
  - Update TOPs based on new challenge level determination process

**Status:** In process
- Incorporation into TOPs by Mar 08

# CBCS T&E Subtask 2 cont'd

- **Test methods/outputs will reflect the needs of the service on the future battlefield and on definitions established in the CBCS Policy (and Draft DoDI)**
- **Objective:**
  - Revise existing TOPs
  - Draft New TOPs
  - Link TOPs to information needed by Senior Leadership for decision making
- **Product:**
  - 2 Revised TOPs (1) Large Item Exteriors (2) Small Items
  - 2 New TOPs (1) Large Item Interiors (2) Material Testing

**Status:** In process

- Publish 2 Revised TOPs by Mar 08
- Final Draft of 2 New TOPs by Mar 08

# CBCS T&E Subtask 2 cont'd

- **Review current test equipment, decontamination apparatus sampling devices and test facilities to determine what is required and what gaps exist**
- **Objective:**
  - Review current test infrastructure
- **Product:**
  - List of facilities and identification of gaps

**Status:** In process

- Test facility survey awaiting responses
- Estimate completion by Mar 08

# CBCS T&E Subtask 3

- **Develop a process to assist the Sponsor in determining specific tests or assessments required**
- **Objectives:**
  - Develop factors that will determine requirements for testing of the system/subsystem
  - Develop cost v. risk analysis to determine the type and degree of testing or assessment required and necessary test information.
  - Identify required data and template
  - Staff the process with Test SMEs
  - Brief the product to the Steering Committee
- **Product:**
  - A process that determines which CBCS test/assessment needs to be performed

**Status:** In process

- Draft Brief to Steering Committee in Dec 07

# CBCS T&E Subtask 4

- **Develop needed output/data from test/assessment evaluation report of CBCS performance**
- **Objectives:**
  - Develop criteria in conjunction with Users Group from PM and Testers
  - Staff with Users and incorporate changes
  - Crosswalk data collected against survivability criteria and resolve any technical challenges
  - Distribute to Acquisition community
  - Ensure that T&E reports meet the needs of the users
- **Product:**
  - Template for TEMPs and Capabilities Documents

**Status:** In process

- Need distribution to Acquisition Community
- Drafted language for Templates

# CBCS T&E Subtask 5

- **Develop a process for ensuring accountability of recommendations**
- **Objectives:**
  - Draft process based on new DoDI and correct testing processes
  - Conduct education campaign
- **Product:**
  - A template for reports to record needed output/data from evaluation report. Detailed process for including CBCS SMEs participation in the TEMP process.

**Status:** On Hold
- Pending publishing for new DoDI

# CBCS T&E Subtask 6

- **Develop educational procedures/materials for capabilities documents**
- **Objectives:**
  - Develop educational materials and procedures
  - Staff with Materiel and Combat Developers and JRO
  - Incorporate changes
  - Brief to Steering Committee
- **Product:**
  - Educational materials for capabilities document developers

**Status:** On Hold
- Pending publishing for new DoDI