

2006 Joint Chemical Biological, Radiological and Nuclear (CBRN) Conference & Exhibition

Fort Leonard Wood, MO "Combating Weapons of Mass Destruction"

26-28 June 2006

Onsite Agenda

Tuesday, 27 June 2006

Keynote Speaker - Combating WMD

Dr. Tegnelia, Director, Defense Threat Reduction Agency and Deputy Director, STRATCOM Center for Combating WMD

Chemical and Biological Defense and Chemical Demilitarization Program

COL Michael O'Keefe, USA, Chief of Staff to the Special Assistant for Chemical & Biological Defense and Chemical Demilitarization Programs

Joint Requirements Office-Chemical Biological, Radiological and Nuclear Defense Office Update MG Bromberg, USA

Joint Combat Developer Update

BG Stanley H. Lillie, USA

Medical Research and Material Command

COL James Romano, USA

International Panel:

Moderator:

- COL Patrick Sharon, USA

Panelists:

- MAJ Tim Mertsock, USA
- Major Jim Cameron, British Army
- Colonel Ho Kong Wai, Singapore Armed Forces

Wednesday, 28 June 2006

Keynote Speaker - CERFP

Maj Gen Annette Sobel, USAF, J-2, National Guard Bureau

Joint Science and Technology Office

Dr. Charles R. Gallaway, Director, Joint Science Technology Office for Chemical and Biological Defense, DTRA

Joint Program Executive Office Update

MG Steve Reeves, USA Program Executive Officer for Chemical and Biological Defense

Technology Panel

- Chairman: BG Dean Ertwine, USA (Ret), NDIA Chem-Bio Defense Division
- Panelists: MG John Doesburg, USA (Ret)

Onsite Program

June 26-28, 2006 Ft. Leonard Wood, MO



Joint CBRN Conference & Exhibition

June 26-28, 2006

Fort Leonard Wood, MO

"Combating Weapons of Mass Destruction"

Proliferation of the capability for nations and terrorist organizations to employ CBRN weapons on the battlefield or against American citizens in the homeland and overseas makes the Chemical Corps' role in the defense of our country more vital than ever before. It is important for the chemical community, the military and civilian employees of the Services and other government agencies, our international partners, contractors, industry, and academia, to come together and share information about our capabilities to defend against CBRN weapons and our requirements for the future.

The Joint CBRN conference does that.

"The Department of Defense finds this event meets the minimum regulatory standards for attendance by DoD employees. This finding does not constitute a blanket approval or endorsement for attendance. Individual DoD Component commands or organizations are responsible for approving attendance of its DoD employees based on mission requirements and DoD regulations." "The Department of Defense finds this event meets the minimum regulatory standards for attendance by DoD employees. This finding does not constitute a blanket approval or endorsement for attendance. Individual DoD Component commands or organizations are responsible for approving attendance of its DoD employees based on mission requirements and DoD regulations."

AGENDA

Monday, June 26, 2006

12:00PM – 5:00PM Registration for Joint CBRN Conference

Exhibit Pavilion outside of

Nutter Field House

5:00PM – 7:00PM Reception in Exhibit Areas

Nutter Field House & Exhibit Pavilion (Dress: Business casual or golf attire)

Tuesday, June 27, 2006

7:00AM - 5:00PM Registration

Exhibit Pavilion

7:00AM – 8:15AM Continental Breakfast

Exhibit Areas

7:00AM – 5:45PM **Exhibits Open**

Nutter Field House & Exhibit Pavilion

8:30AM – 8:45AM **Opening Ceremonies**

Abrams Theater

NDIA Welcome

BG Walt Busbee, USA (Ret)

Chairman, NDIA Chem Bio Defense Division

Abrams Theater

Chief of Chemical Welcome

BG Stanley H. Lillie, USA

Commandant, US Army Chemical School

Abrams Theater

Tuesday June 27, 2006 Cont.

8:45AM – 9:30AM **Keynote Speaker**

Combating WMD

Dr. Tegnelia, Director, Defense Threat Reduction Agency and Deputy Director, STRATCOM Center for Combating WMD

Abrams Theater

9:30AM - 10:00AM **Break**

Exhibit Areas

10:00AM – 10:45AM **NORTHCOM Role in HLD**

MG Davis, USA

Joint Task Force-Civil Support

NORTHCOM

Abrams Theater

10:45AM – 11:30AM Chemical and Biological Defense and Chemical Demilitarization Program

COL Michael O'Keefe, USA

Chief of Staff to the Special Assistant

for Chemical & Biological Defense and Chemical

Demilitarization Programs

Abrams Theater

11:30AM – 1:00PM **Lunch**

Exhibit Areas

1:00PM – 1:45PM **Joint Requirements Office-Chemical**

Biological, Radiological and Nuclear Defense

Office Update

MG Bromberg, USA

Abrams Theater

Tuesday June 27, 2006 Cont.

1:45PM – 2:30PM **Joint Combat Developer Update**

BG Stanley H. Lillie, USA

Abrams Theater

2:30PM – 3:00PM Medical Research and Material Command

COL James Romano, USA

Abrams Theater

3:00PM – 3:30PM **Break**

Exhibit Areas

3:30PM – 5:00PM International Panel

Moderator: COL Patrick Sharon, USA Panelists:MAJ Tim Mertsock, USA Major Jim Cameron, British Army

Colonel Ho Kong Wai, Singapore Armed Forces

Abrams Theater

5:00PM Adjourn for the Day

Wednesday, June 28, 2006

7:30AM – 3:00PM Registration and Continental Breakfast

Exhibit Areas

8:20AM-8:25AM **Opening Remarks and Award Presentation**

Chairman: BG Dean Ertwine, USA (Ret) Chairman, NDIA Chem Bio Defense Division

8:25AM-8:30AM **Keynote Introduction**

BG Stanley H. Lillie, USA

Abrams Theater

Wednesday, June 28, 2006 Cont.

8:30AM – 9:15AM **Keynote Speaker**

CERFP

Maj Gen Annette Sobel, USAF J-2. National Guard Bureau

Abrams Theater

9:15AM – 10:00AM Joint Science and Technology Office

Dr. Charles R. Gallaway

Director, Joint Science Technology Office for Chemical and Biological Defense, DTRA

Abrams Theater

10:00AM - 10:30AM **Break**

Exhibit Areas

10:30AM – 11:15AM Joint Program Executive Office Update

MG Steve Reeves, USA

Program Executive Officer for Chemical

and Biological Defense

Abrams Theater

11:15AM – 11:45AM 20th Support Command (CBRNE)

BG Kevin Wendel, USA

Abrams Theater

11:45AM – 1:00PM **Lunch**

Exhibit Areas

Wednesday, June 28, 2006 Cont.

1:00PM – 2:30PM **Technology Panel**

BG Dean Ertwine, USA (Ret)

Chairman, NDIA Chem-Bio Defense Division Panelists: MG John Doesburg, USA (Ret)

Director, Homeland Security Programs

Oak Ridge National Laboratory

Dr. Jeffrey Stiefel, Ph.D. Program Executive Officer

Chemical and Biological Security Programs

Science and Technology Directorate Department of Homeland Security

COL Ben Hagar

Deputy, Joint Science & Technology for

Chem-Bio Defense

Defense Threat Reduction Agency

Mr. Ed Wack

Director, Future Acquisition JPEO-Chem-Bio Defense

Abrams Theater

2:30PM – 2:35PM NDIA Closing Remarks

BG Dean Ertwine, USA (Ret)

Chairman, NDIA Chem-Bio Defense Division

Abrams Theater

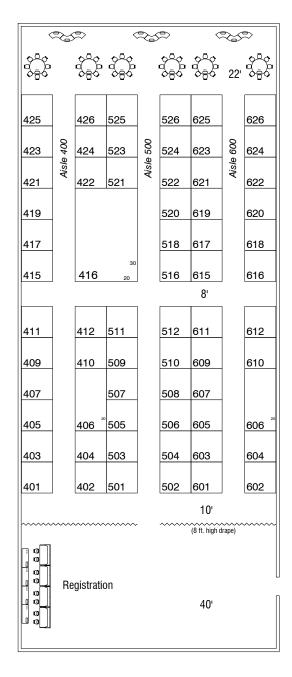
2:35PM - 4:00PM **Break**

Exhibit Areas

3:00PM – Complete **Demonstrations**

behind Exhibit Pavilion

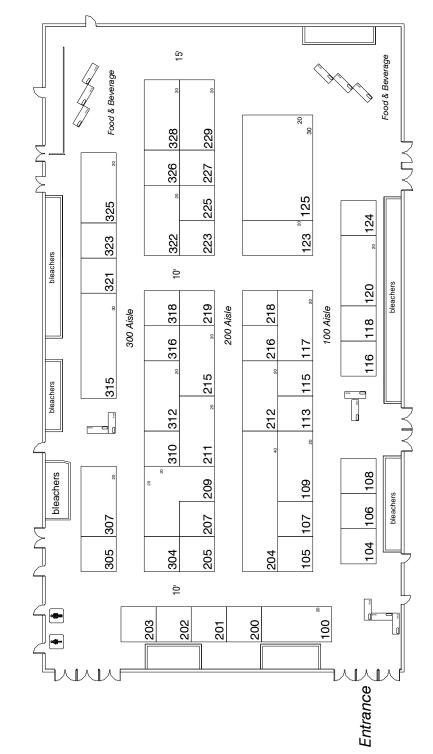
Exhibits Pavilion Fort Leonard Wood, Missouri



Entrance

Exhibits Pavilion 82'x200'

Nutter Field House Fort Leonard Wood, Missouri



Exhibitors

Company Name	Booth #
Advanced Measurement Technology	616
Agentase	124
Ahura Corporation	323
Air Techniques International	200
AirBoss-Defense	412
Allen-Vanguard	401
Alluviam LLC	227
AMETEK- Aerospace & Defense	203
Arcadis	116
Argon Electronics	201
AristaTek Inc.	207
Aspen Systems, Inc.	509
Audiopack	305
Avon Protection Systems, Inc.	202
Base-X Shelters	22
Base-X Shelters	23
Battelle	322
Brimrose Corporation of America	610
Bruker Daltonics	307
BW Technologies	115
CamelBak	605
CBIAC	113
Chemical Corps Regimental Association	502
Chemical Corps Regimental Association	416
Clean Earth Technologies, LLC	507
Concurrent Technologies Corporation	215
Constellation Technology	212
Creative Building Products	617
Defense Threat Reduction Agency	122
- PAO	
Draeger Safety, Inc.	223
DRS Sustainment Systems, Inc.	123
DRS Sustainment Systems, Inc.	7
EAI Corporation	310
ECS	615
EG&G DMI	316
EMD Pharmaceuticals, Inc.	213
EnviroFoam Technologies	107
First Line Technology	21
General Dynamics - ATP	204
Gentex Corporation	603
Global Ground Support	205
Global Protection, Ilc	219
Griffin Analytical Technologies	124
Guardian Mfg Co	621
Hunter Manufacturing Company	109
IEM	609
INFICON	104
	104
Intelagard, Inc.	209
ITT AES	209

Company Name	Booth #
JEAP	523
JPEO for Chem Bio Defense	125
JPEO for Chem Bio Defense	28
Kalman & Company, Inc.	525
LANX Fabric Systems	108
MacAulay Brown	119
MadahCom	503
MadahCom	18
MesoSystems Technology, Inc.	124
Military Medical Technology	611
Milliken & Company	607
Mobile Medical International Corp.	404
Morphix Technologies	118
NanoScale Materials	512
NBC International	225
NDIA	17
NDIA	1
Nor E First Response, Inc.	15
	19
Northrop Grumman	325
Northrop Grumman	618
Nucsafe, Inc.	326
Oak Ridge National Laboratory	
OI Analytical/CMS Field Products	602
Omni Measurement Systems, Inc.	510
OptiMetrics, Inc.	100
OWR Corp	504 516
Paul Boye Technologies	211
PDA LLC	
Pine Bluff Arsenal	229 106
Proengin Inc	402
QuickSilver Analytics, Inc.	_
RADeCO, Inc	619
RAE Systems	501
Reeves EMS, LLC	24
Reeves EMS, LLC	26
Remploy Textiles	612
Safe Reflections, Inc	521
SafetyTech International, Inc.	606
SAIC	312
Sceptor Industries, Inc.	304
Scott Specialty Gases	601
Smiths Detection	315
Srategic Technology Enterprises, Inc.	506
Survival Inc.	511
Tex-Shield, Inc.	328
The Sigmon Group	218
TSI Incorporated	318
TVI Corporation	16
USAA	505
USAES-DEI	604
W. L. Gore & Associates, Inc.	321

Thank you to our sponsors.



















See you next year! June 25-27, 2007 Ft. Leonard Wood, MO



JOINT REQUIREMENTS OFFICE FOR CBRN DEFENSE



MG Howard Bromberg

Deputy Director for Force Protection (DDFP), J-8 and Director, JRO-CBRND

Strategic Environment

Interim RANGE OF MILITARY OPERATIONS "Prevent Our Enemies from Threatening Us, Our Allies and Our Friends with THE COURSE OF STREET Weapons of Mass Destruction." "We must possess the full range of **National Security Strategy** operational capabilities to protect March 16, 2006 the United States, US military

forces, and partners and allies from

the threat or actual use of WMD." **Chairman Joint Chiefs of Staff**

February 13, 2006

"Uncertainty is the defining characteristic of today's strategic environment. While we work to avoid being surprised, we must posture ourselves to handle unanticipated problems – we must plan with surprise in mind."

> **National Defense Strategy** March 1, 2005

QDR Objective - Shift in Focus

Provide more options for President, capabilities for CoComs

Post-9/11 Security Challenges

<u>Irregular</u>

Non-state and state actors employing "unconventional" methods to counter stronger state opponents; terrorism insurgency, etc.

Traditional

/ULNERABILITY

States employing military forces in well-known forms of military competition and conflict

Catastrophic

Terrorist or rogue state employment of WMD or methods producing WMD-like effects against U.S. interests

Disruptive

Competitors employing technology or methods that might counter or cancel our current military advantages

LIKELIHOOD

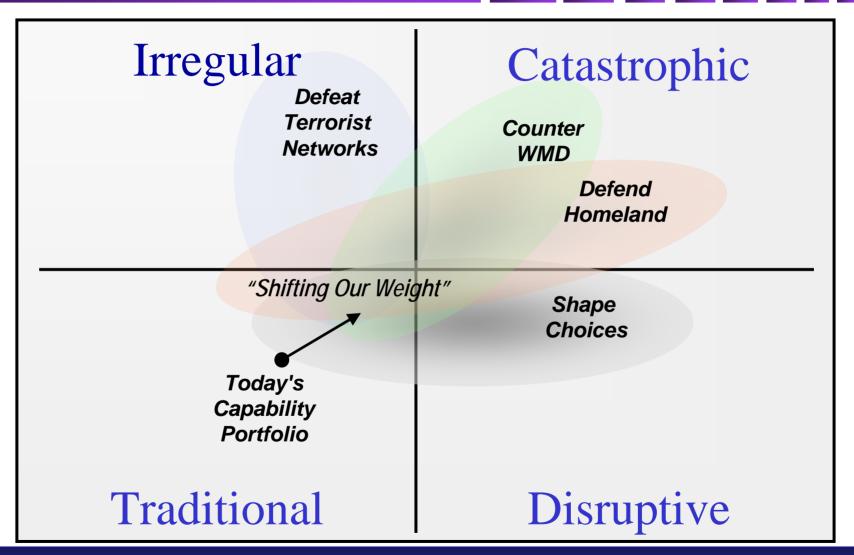
Capability Focus Areas

Options for President

Capabilities for COCOMs

- Defeat terrorist networks
- Defend homeland in depth
- Prevent acquisition or use of WMD
- Shape choices of countries at strategic crossroads (Assure, Dissuade, Deter, Defeat)

QDR Objective - Shift in Focus



Continuing the reorientation of military capabilities and implementing enterprise-wide reforms to ensure structures and process support the President and the warfighter

Combating WMD Mission Areas

<u>Mission</u>: Dissuade, deter, defend against & defeat those who seek to harm the U.S., its allies and partners through WMD use or threat of use, and, if attacked, mitigate the effects and restore deterrence.

Enemy capable of WMD use / subsequent use

Defeat. Deter

- > Offensive Operations
- > WMD Elimination
- > Active Defense
- > Passive Defense
- > WMD Interdiction
 - > Offensive Operations
 - > WMD Interdiction
 - Security Cooperation & Partner Activities

Prevent, Dissuade, Deny

Potential adversaries or others attempt to possess or proliferate

Enemy uses WMD

Defend, Respond, Recover

- > Passive Defense
- > Active Defense
- > WMD Consequence Management

Detection

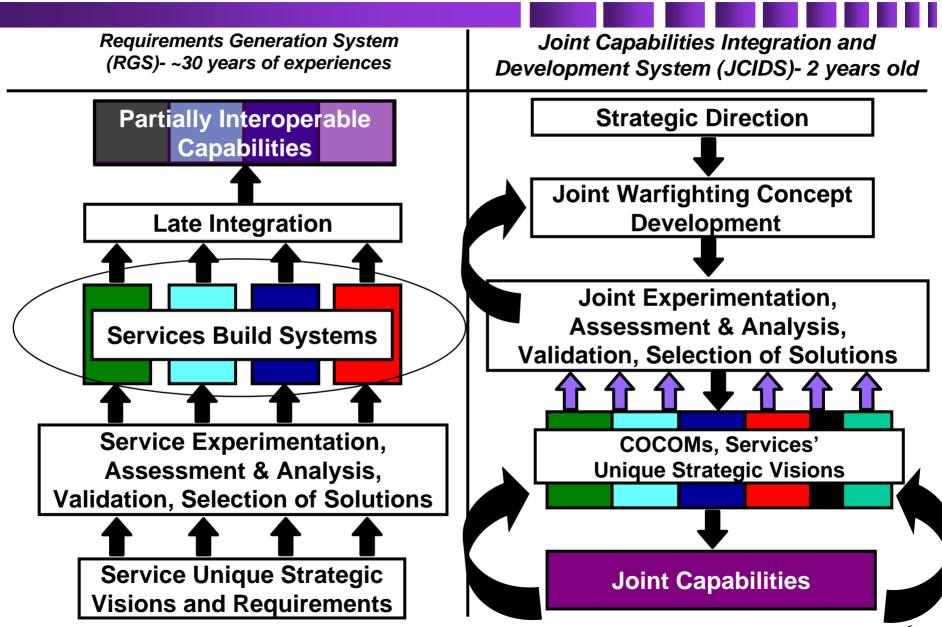
Intelligence

> Threat Reduction Cooperation

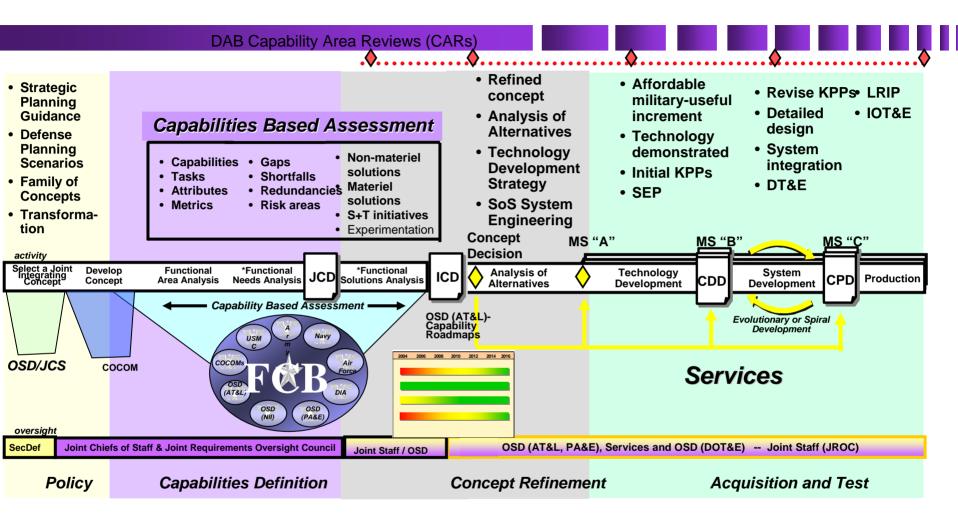
Reduce, Destroy, Reverse

Others agree to destroy or secure current WMD

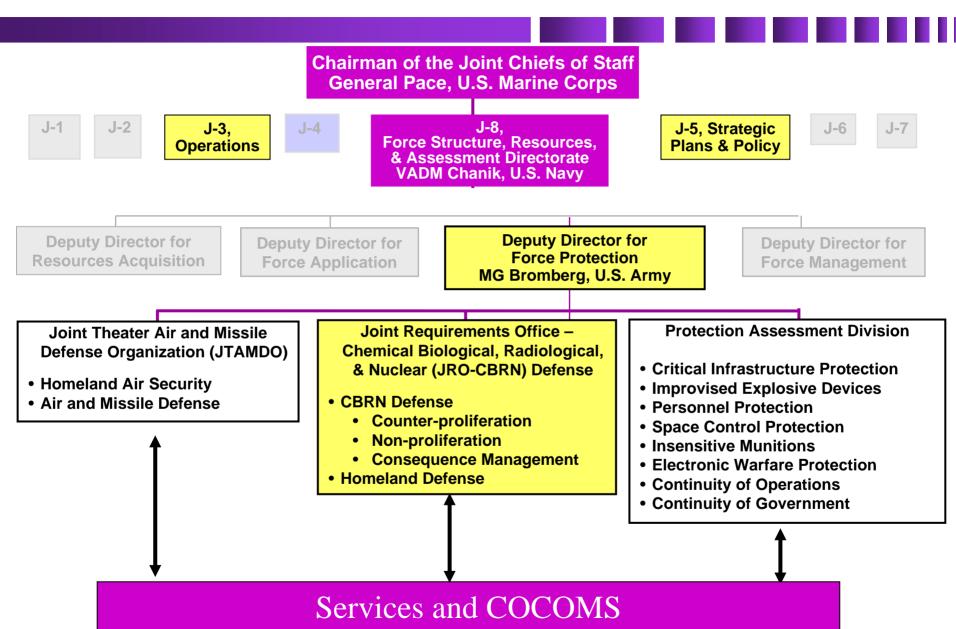
Threat vs Capability Based Planning



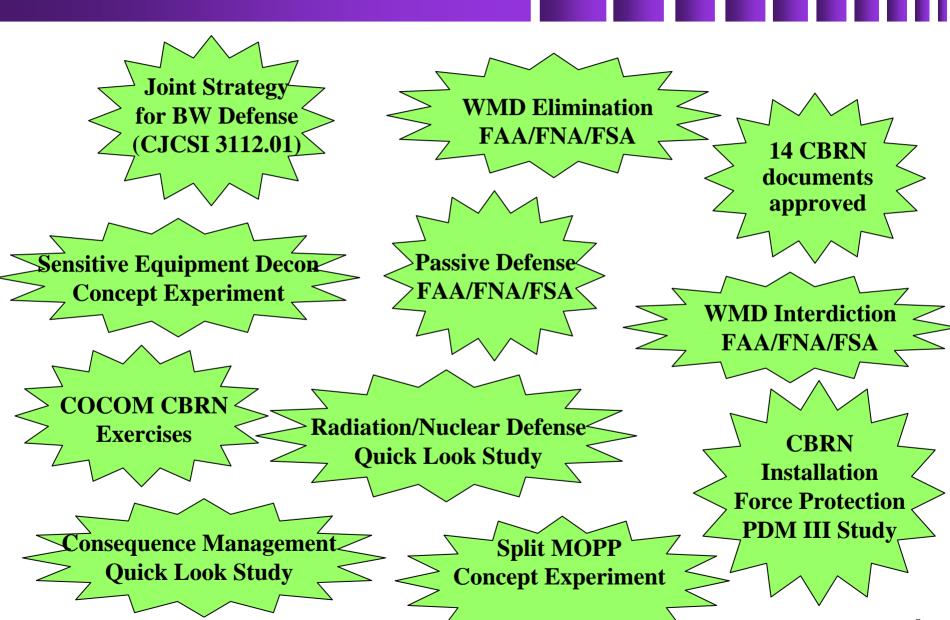
The DoD Process



Joint Staff and J8 DDFP Organization



JRO CBRND Accomplishments



JRO-CBRN Defense Current Actions

Sensor Mix Study Consequence Management FAA/FNA/FSA

DOTMLPF Change Recommendations

WMD PME CJCSI 1800.01 CBRN Defense
Program
Objective
Memorandum
FY08-13

Agent Challenge Study

Expendable Equipment Combat Consumption (E2C2) Study

3 New CBRN ICD/CDD/CPD

Robotic Decon Concept Experiment

- Modernize Consequence Management capabilities
 - WMD CST
 - CERFP
 - CBIRF
 - JTF CS
- New WMD Elimination capabilities
 - 20th CBRNE Command to be JTF-Elimination HQ
- CBDP MILCON
 - Lab and T&E Infrastructure upgrades



Program transforming with Strategic Environment

- Accept current operational risk
- Invest to meet future challenges
- Quadrennial Defense Review results
- New Force Planning Guidance



STRATCOM as Combating WMD lead combatant commander

- Integrate and synchronize DOD capabilities
- STRATCOM Center for Combating WMD (SCC)
- Combating WMD Joint Integrating Concept
- Priority to Interdiction and Elimination missions

Questions

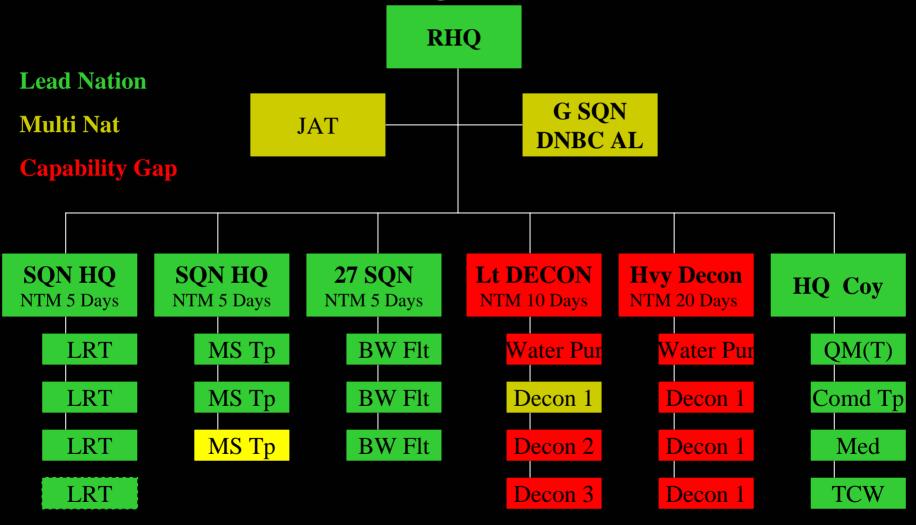
Major A J Cameron

OC NATO Deployable Analytical Laboratories

UK Joint CBRN Regiment



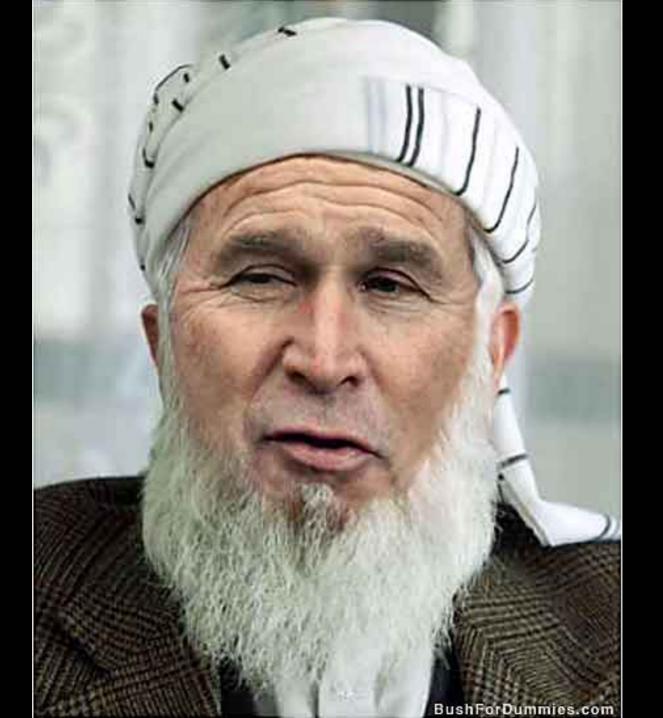
Jt CBRN Regt to CBRN Bn



NBC – AL Concept













The Light Role Team















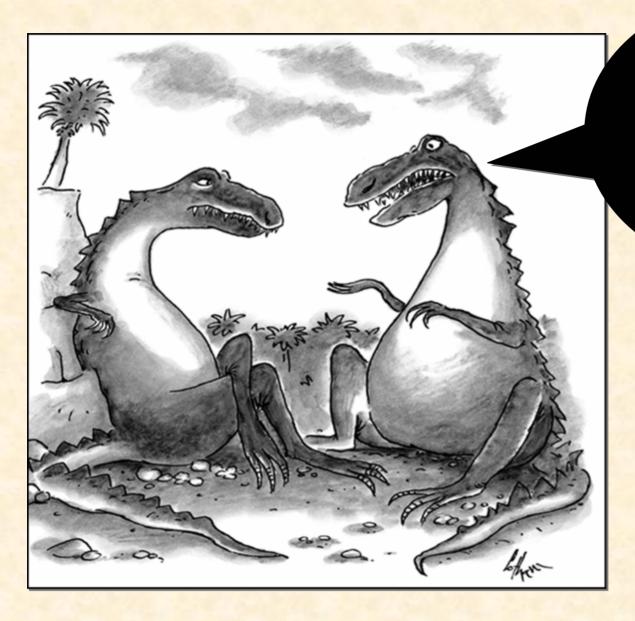
Oak Ridge National Laboratory and the University of Tennessee

Technology for Today and the Future

John C. Doesburg

Associate Vice President for Research, University of Tennessee Director, Homeland Security Programs, Oak Ridge National Laboratory Director, UT-ORNL Center for Homeland Security

June 2006 Oak Ridge, Tennessee



"All I'm saying is, now is the time to develop the technology to deflect an asteroid."



Today, ORNL is DOE's largest multipurpose science laboratory

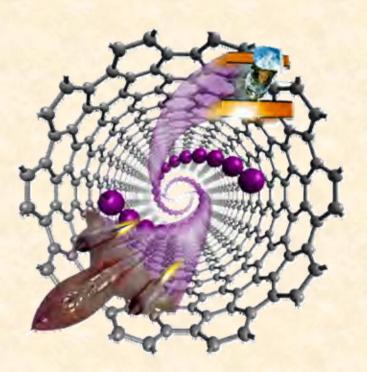


- \$1.08 billion budget
- 4,000 employees
- 3,000 research guests annually
- Nation's largest unclassified scientific computing facility

- Nation's largest science facility: the \$1.4 billion Spallation Neutron Source
- Nation's largest concentration of open source materials research
- Nation's largest energy laboratory
- \$300 million modernization in progress

Our aspiration: Best lab in the world at what we do

- Control of functionality at the nanoscale
- Leadership-class computing for the frontiers of science
- Integration of biology and ecology, based on the foundation of understanding molecular-level interactions
- Integration of science, technology, and thought leadership for energy
- Innovative solutions that improve national, homeland, and global security



We have significant strengths in key areas

Radiological and nuclear weapons countermeasures

- RDD attribution studies, forensics program development, and decontamination of the aftermath
- Active interrogation technologies
- Radiation detection technologies and new materials

Chemical and biological

- Mass spectrometry
- Bioinformatics
- Host-pathogen interactions



Threat vulnerability testing and

assessment

- Geospatial science
- Plume/effect modeling
- Cybersecurity technology

bility DAY NIGHT

Crosscutting

- Sensor technologies
- Knowledge discovery

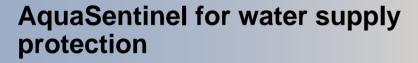




Significant advances in sensors and detectors

Block II Chemical-Biological mass Spectrometer Detector

Microcantilever sensors for detection of explosives and chemicals



RAMiTS for detection of chemical agents and other hazardous chemicals

Biochip for detection of bacteria, viruses, and toxins



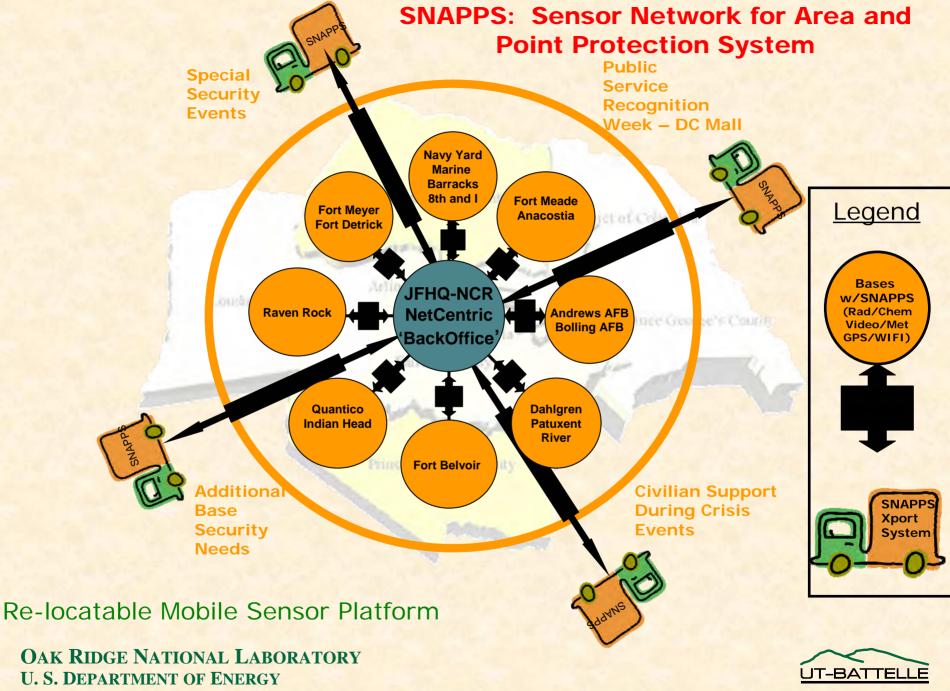


Forward Area Semi-Autonomous Robotic Tactical Detection & Decontamination



Advanced Technology Assessment











Summer Workshop Net-Ready Sensors: The Way Forward

What: The National Institute of Standards and Technology (NIST), the Joint Program Executive Office, Chemical and Biological Defense (JPEO-CBD), and Oak Ridge National Laboratory (ORNL) are sponsoring a two-day workshop on "Net-Ready Sensors: A Way Forward."

Where: ORNL's campus in Oak Ridge, Tennessee

When: August 2-3, 2006

The Net-Ready Sensors Workshop will provide an opportunity for developers and subject matter experts to share their interests in the DoD's development of **net-centric CBRN sensor architectures**. This will be an unclassified workshop. The agenda will include presentations and discussions on plug and play standards for sensor networks, sensor data standards, commercial offerings for net-centric sensor applications, and sensor network research.

The Workshop organizers are David Godso, of JPEO-CBD, Bryan Gorman, of ORNL, and Kang Lee, of NIST.

Interested parties wishing to participate in the workshop should contact one of the organizers (see below) by 1 July 2006. Attendance will be limited to 40 participants.

Contact Information

Dave Godso

godso@spawar.navy.mil

OAK RIDGEON AND LABORATORY

U. S. DEPARTMENT OF ENERGY

Bryan Gorman gormanbl@ornl.gov 865.576.4241 Kang Lee
kang.lee@nist.gov
301.975.6604

UT-BATTELLE

Knowledge Discovery from Text: A Success Story

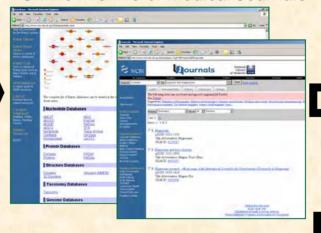
Biomedical Journals

Low Cross-reference within disciplines



PubMed Archives

Online Archive of Medical Journals



Question:

What causes migraine headaches?

Text Analysis

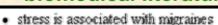
and Mining

Ramadan et al., 1989

Confirmed by Experts



Extracted evidence from titles of articles in the biomedical literature



- · stress can lead to loss of magnesium
- calcium channel blockers prevent some migraines
- magnesium is a natural calcium channel blocker
- spreading cortical depression (SCD) is implicated in some migraines
- high leveles of magnesium inhibit SCD
- migraine patients have high platelet aggregability
- magnesium can suppress platelet aggregability

New Hypothesis: Magnesium Deficiency leads to Migraine

(New medical knowledge)



Swanson, 1987

Example from Hearst, 1999

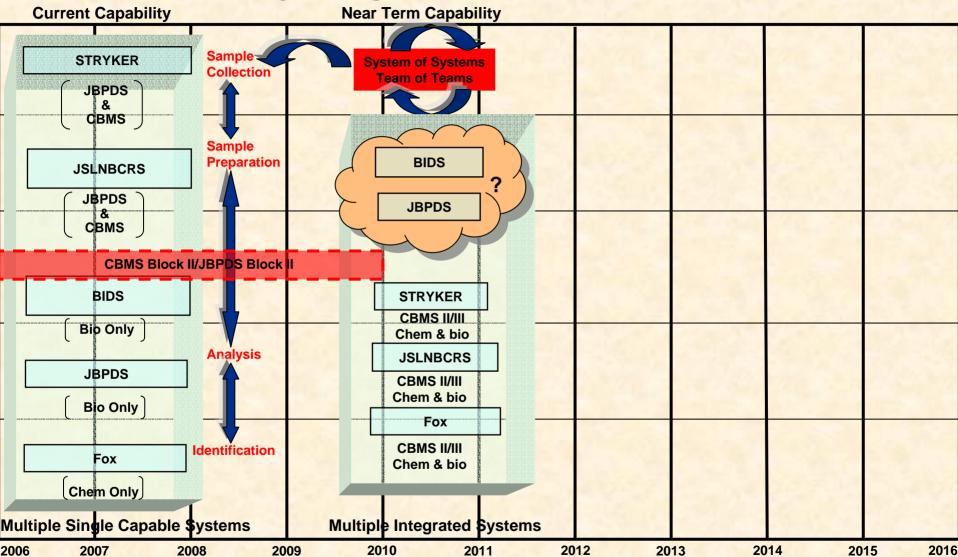
Swanson et al., 1991, 1994, 1997

Hypothesis Generation: "Chains of causal implication within the medical literature can lead to hypotheses for causes of rare diseases"

Pursuing The Challenges of The Future Detection of Genetically Modified Organisms

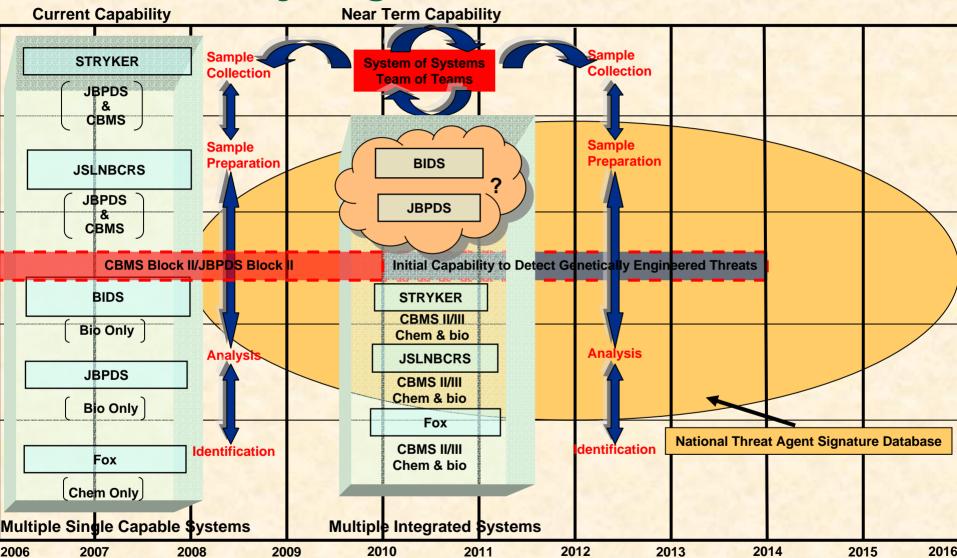
- A System of Systems approach to the detection of chemical and biological agents with a focus on genetically engineered organisms (GMOs)/genetically engineered threats (GETs)
 - A true National/Grand Challenge could be the Manhattan Project for the21st Century
- Pulling together world-class researchers, Oak Ridge National Laboratory and UT faculty
- ORNL Laboratory Agenda Item significant laboratory directed research and development (LDRD) funding

Strategic Roadmap for Genetically Engineered Threat Detection

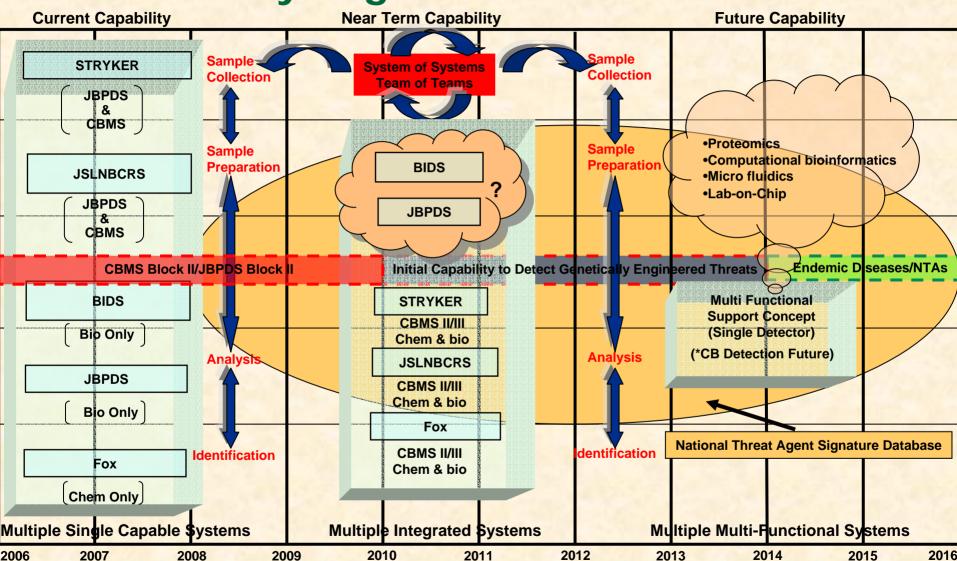




Strategic Roadmap for Genetically Engineered Threat Detection



Strategic Roadmap for Genetically Engineered Threat Detection







"Imagination is more important than knowledge ..."

"The important thing Is not to stop questioning ..."

"If we knew what it was we were doing, it wouldn't be called research, would it?"

Albert Einstein





Oak Ridge National Laboratory

Questions?

Battelle The Business of Innovation

Joint CBRN Conference Technology Panel

BG (Ret) Dean Ertwine 28 June 2006

TECHNOLOGY - The Competition

Global R&D Spending

Country	GDP 2004	R&D as % GDP	R&D 2004	R&D 2005	R&D 2006
U.S.	11,200	2.7	302	312	321
China	7,262	1.5	109	125	140
Japan	3,745	3.2	120	123	126
India	3,319	1.4	46	53	58
France	1,981	2.2	44	44	45
Germany	2,362	2.2	52	53	54
UK	1,782	2.0	36	37	38

Billions \$

Source: R&D Magazine, Battelle, OECD, World Bank



TECHNOLOGY - The Competition

Sources of R&D Funding

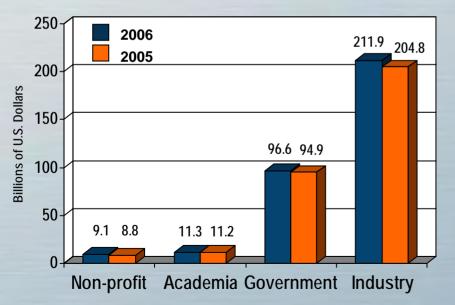
Country	Industry (%)	Government (%)	Academia (%)	From Abroad (%)
U.S.	61.2	31.3	7.3	-
China	57.6	33.4	6.3	2.7
Japan	73.9	18.2	7.5	0.4
India	23.0	74.7	2.3	
France	52.1	38.4	1.5	8.0
Germany	65.4	31.9	.4	2.3
UK	46.7	26.9	5.9	20.5

Source: R&D Magazine, Battelle, UNESCO

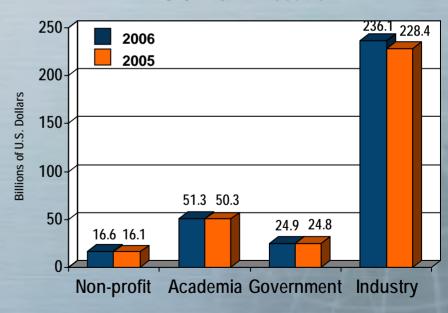
TECHNOLOGY - U.S. R&D Funding

- U.S. funding is forecast to increase 2.9% in 2006 to \$329 billion.
- Two-thirds of all R&D is driven by the industrial sector, which rises 3.5%.
- Globalization, the federal deficit, and staffing will affect future funding.
- Growth of defense R&D funding has slowed and will likely reverse.
- Ratio of Development/Research continues to increase

U.S. R&D Funding Sources



U.S. R&D Execution

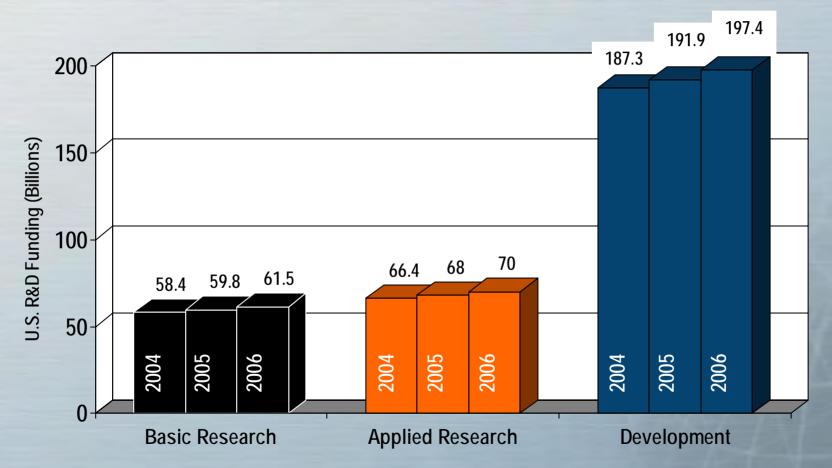


Source: Battelle, R&D Magazine

Battelle
The Business of Innovation

TECHNOLOGY - Big "D", Little "R"

Increasing Trend to Development





TECHNOLOGY - Federal R&D Appropriations

Government Agency	FY2005	FY2006	Change
Dept. of Defense	71.566	73.039	2.1%
Health and Human Services	29.084	29.023	-0.2%
NASA	10.705	11.367	6.2%
Dept. of Energy	8.614	8.608	-0.1%
National Science Foundation	4.057	4.123	1.6%
U.S. Dept. of Agriculture	2.403	2.394	-0.4%
Dept. of Homeland Security	1.243	1.281	3.1%
Dept. of Commerce	1.148	1.131	-1.5%
Dept. of Transportation	0.744	0.841	13.0%
Dept. of Veterans Affairs	0.784	0.805	2.7%
Dept. of Interior	0.615	0.629	2.2%
Environmental Protection Agency	0.572	0.573	0.2%
Dept. of Education	0.297	0.258	-13.0%
All Other	0.727	0.692	-4.8%
Total	132.560	134.765	1.7%

Source: AAAS (Billions \$)

TECHNOLOGY - Federal 2006 R&D Highlights

- DOD initially requested an overall cut in FY06 –
 Congress provided \$1.5B increase (+2.1%)
- DOD appropriation contains a 1% rescission for all previously approved R&D appropriations
- DOD projections reveal 10% cut through FY09
- DOE programs were cut 0.4% in FY06. Support for some science—user facilities was cut as much as 60%
- DHS R&D budget increases 3.1% to \$1.3B.
 - -\$210M for Rad/Nuc countermeasures (+71%)
 - -\$376M for Biological countermeasures (+3.7%)

TECHNOLOGY - Issues

- Impact of anticipated federal deficit on discretionary R&D spending
- Increasing shift from research funding to development funding
- The rise of international R&D competitors
- Evidence that U.S. educational system is not producing the necessary talent for competitive R&D



TECHNOLOGY - Panel Members

DOE MG (Ret) John Doesburg

Director, Homeland Security Programs, ORNL Assoc. VP for Research, Univ. of Tennessee

DHS S&T Dr. Jeff Stiefel

PEO for Chem-Bio Security Programs

DTRA COL Ben Hagar

Deputy, Joint S&T Office for Chem-Bio Defense

JPEO-CBD Mr. Ed Wack

Director, Future Acquisition



Chemical Biological Defense Program Science & Technology

A Look to the Future

Dr. Chuck Gallaway

Chemical Biological Defense Program (CBDP)
Joint Science & Technology Office (JSTO)

Defense Threat Reduction Agency (DTRA) Chemical/Biological Technologies Directorate





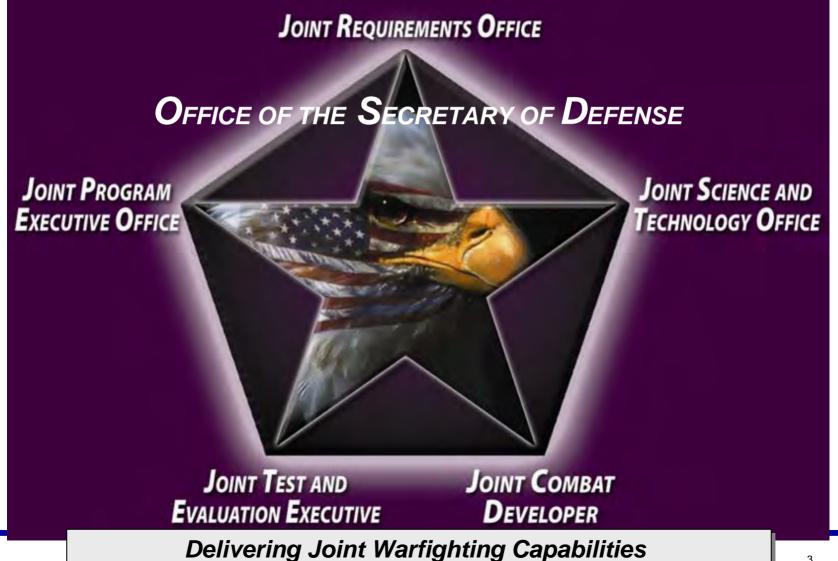
28 June 2006



- Background
- Business strategy
- The S&T challenges
- Sustaining S&T
- Conclusions



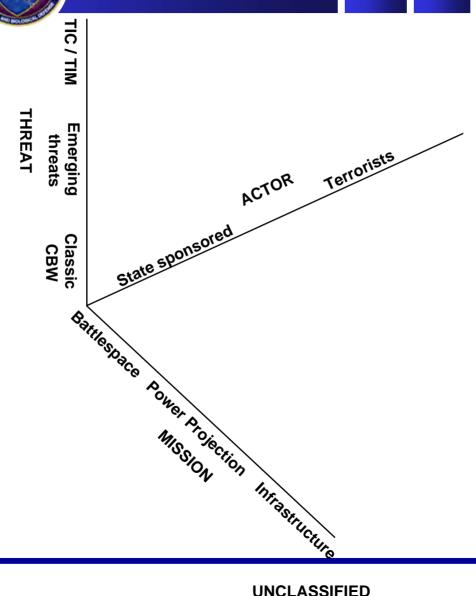
We are the S&T arm of the CBDP



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The CB threats and CBDP mission space are expanding





Vision

Eliminate chemical and biological warfare agents as a threat to the warfighter

Mission

Develop and sustain a robust, agile, and flexible science and technology program to support chemical and biological defense capability needs





We are organized by capability areas

Medical	Science	& Technol	logy
			

Pretreatments

Therapeutics

Diagnostics

Emerging Threats

Medical Radiological Defense

TMTI

Applied Technology Physical Science & Technology

Detection

Protection

Decontamination

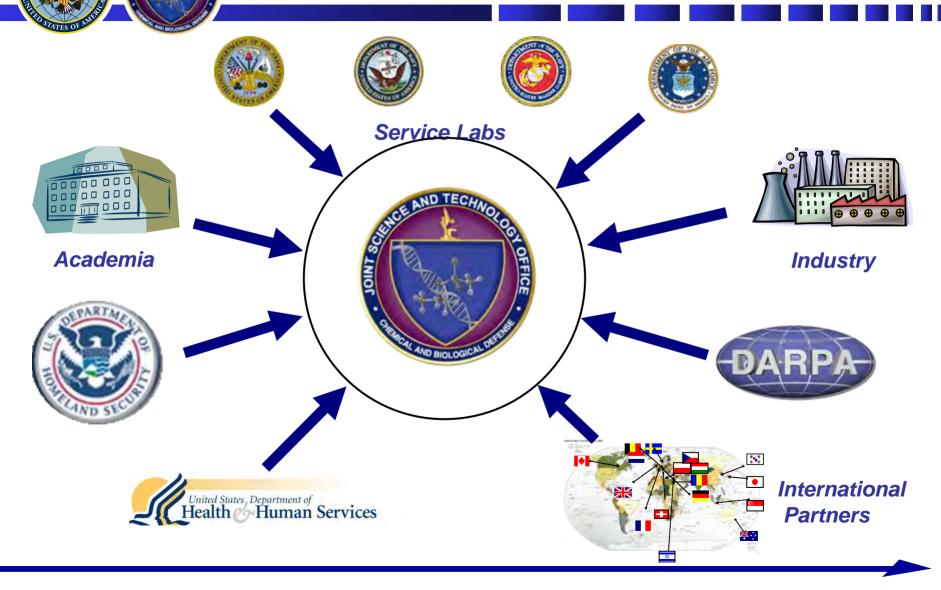
Modeling & Simulation

Threat Agent Science



Leveraging the best in class from

across the spectrum of performers





- Background
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- The S&T challenges
- Sustaining S&T
- Conclusions



- Technically challenging
 - Exceedingly high customer expectations
 - No "silver bullet" solutions

- Scientifically diverse
 - Numerous and disparate disciplines
 - Distinct chemical and biological solutions







DoD has placed significant emphasis on RDT&E

- Enhanced Planning Process (EPP)
- Quadrennial Defense Review (QDR)
- OSD FY08-FY13 POM guidance

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QDR - Countering WMD remains a DoD priority

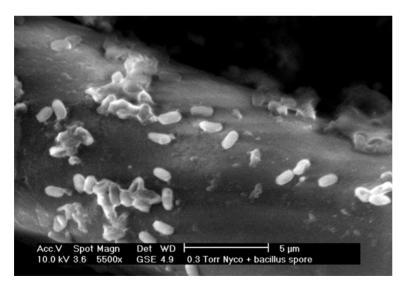
- Future program direction
 - "...fund a \$1.5 billion initiative over the next five years to develop <u>broad-spectrum</u> <u>medical countermeasures</u> against the threat of genetically engineered bio-terror agents."
 - "Additional initiatives will include developing <u>advanced detection and deterrent</u> <u>technologies</u> and facilitating full-scale civil-military exercises to improve interagency planning for complex homeland security contingencies."
- Form domestic and international partnerships
 - "Close cooperation with these partners in the long war on terrorism, as well as in efforts to counter WMD proliferation and other non-traditional threats, ensures the continuing need for these alliances and for improving their capabilities."
 - "...establishment of a National BioDefense Campus at Fort Detrick, Maryland with the U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) and the Defense Intelligence Agency's Armed Forces Medical Intelligence Center (AFMIC) at its core – to improve cooperation among agencies conducting research and development of medical biological defenses."
- Need for high quality personnel
 - "Finally, the Department must effectively compete with the civilian sector for high-quality personnel. ... a new Human Capital Strategy for the Department,..."

11



S&T investment strategy

- Fully fund highest priority S&T gaps
- Burdensharing
- Technology watch



BG Spores collecting on an anti-microbial fiber

Anthrax cell



Plasmid

Cytoplasm+RNA +Proteins

DNA

Plasma Membrane

Cell Wall

S-Layer (proteins)

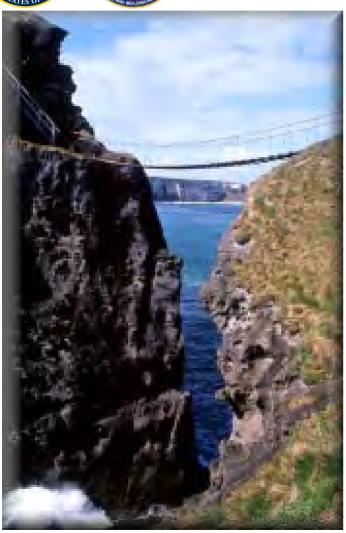
Capsule (poly-D -glutamic acid)







Supporting programs of record



Bridging the "valley of death" between S&T and advanced development

- Evolutionary advancements align w programs of record
- 35 Technology Transition Agreeme
- Relatively low risk technology

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Shift towards revolutionary improvements

- New science
- Interdisciplinary teams
- Non-traditional performers

Risk tolerant

a carbon sphere doped with a reactive nanoscale metal oxide component



a nanofibrous web surface-coated with a nanoscale adsorbent + catalyst



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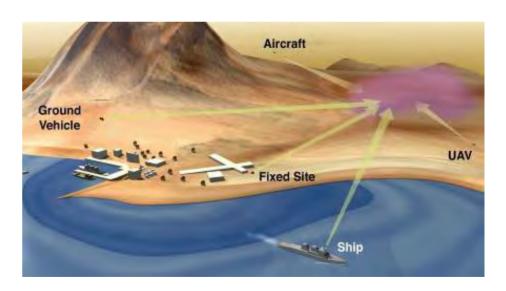


Our S&T challenges

- Earliest warning
 - Detection
 - Medical diagnostics
 - Information dissemination
- Broad spectrum medical countermeasures
 - Pretreatment
 - Therapeutics
- "How clean is safe?"
 - Decontamination
 - Low-Level toxicology
 - Environmental fate of agent



- Current Efforts
 - Explore terahertz spectroscopy for detection
 - Investigate laser-induced millimeter wave fluorescence for better bio discrimination
 - Exploit Semiconductor Ultra Violet Optical Sources (SUVOS) being developed by DARPA for the detection of bio agent aerosols.
- Challenges
 - Signatures from "nontraditional" regions of the electromagnetic spectrum
 - Techniques and algorithms for discriminating signatures from a complex background



Detect and identify biological threats at standoff distances



Diagnostics

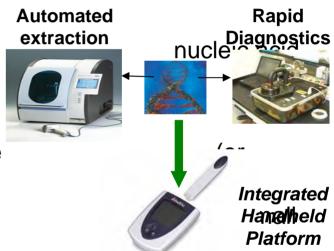
Current Efforts

- Developing nucleic acid and antigen detection assays and reagents
- Assessing resequencing technology for rapid identification of emergent/genetically engineered bio agents
 Automated
- Establishing standards for DoD developed and immunodiagnostic assays

Challenges

- Biological sample viability at room temperature above) for up to seven days
- Integrated platform for nucleic acid, protein molecule toxin diagnostics
- Simple, small, and integrated sample processing and testing platforms
- Assays for early (pre-symptomatic) markers of exposure
- Rapid diagnostic tests to identify antibiotic resistance markers

Portable and deployable diagnostic capabilities, easy to operate, and with minimal logistical requirements



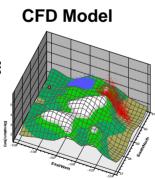


Battlespace Awareness

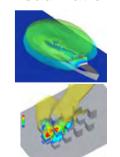
- Current Efforts
 - Developing computational fluid dynamic (CFD) libraries for a particle transport model to provide rapid and high resolution analysis around buildings and ships
 - Developing techniques to use high-resolution radar data to improve wind fields for models
 - Providing automatic source term estimation using data from either sensors or observations

Challenges

- Intelligent "network centric" sensor arrays
- Improved CBRN hazard prediction on comple urban terrain



Ship and Urban Visualization



Reliable, automated warning in a common operating picture across the theater



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Pretreatments

Current Efforts

- Evaluating select target antigens in various vaccine platforms for immunogenicity, safety, efficacy, and minimal dosing
- Combining current products into one
- formulation for a straight recombinant vaccine (multiagent vaccines)
- Evaluating molecular/genetic platforms

Challenges

- DNA platforms for rapid vaccine development
- Vaccines that are adaptable to emerging threats
- Better understanding of human immune mechanisms
- Broad spectrum medical prophylaxis and countermeasures against all nerve agents

Single vaccines against multiple biological agents
Rapid drug development





Therapeutics

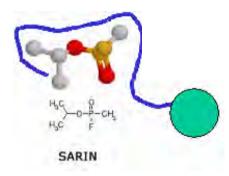
Current Efforts

- Identifying intersecting targets for intervention including common mechanisms of pathogenesis, common host responses, common housekeeping functions
- Identifying and characterizing a candidate broad-spectrum nerve agent reactivator to replace the current reactivator (oxime) in nerve agent therapy

Challenges

- Broad spectrum therapeutics for diverse/emerging threats
- New technologies and methods to accelerate FDA licensure of new products
- Minimal systemic, neurological, ocular, and cutaneous injury due to chemical threat agent exposure
- Develop novel new interventions/approaches
- Leverage and adapt technologies developed for other purposes

Effective countermeasures against bio warfare agents
Multi-agent therapeutic technologies



Nuclease-Resistant
DNA Aptamers with 3'-Caps
Bind & Neutralize
G & V Agents

Transformational Medical Technologies Initiative (TMTI)

Current Efforts

- TMTI goal is to conduct vigorous medical research to develop broad-spectrum medical countermeasures against emerging biological threat agents
- Program targeted for countermeasures against two classes of agents: Hemorrhagic fever viruses and Intracellular bacterial pathogens
- TMTI offerors announced; contracts to be awarded

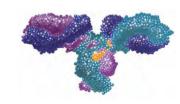
Challenges

 Identify & leverage most promising technologies in the development pipeline for rapid transition to advanced development

 Develop counter-measure products that are regulatory compliant, robust, and highly effective at a reasonable cost.

TMTI represents a novel technology and acquisition experiment







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Decontamination

- Current Efforts
 - Modeling quantum-chemical agent/adsorbent Interactions
 - Studying surface chemistry of vaporous H₂O₂ and ClO₂
 - Developing solvent soluble decontaminating enzymes
 - Aerosolizing activated H₂O₂ for decontamination of aircraft interiors

Challenges

- Removal or detoxification of chemical agents bound in porous matrices
- Smaller quantities and fewer varieties of decontaminants required
- Detection of residual agent on surface and vapors below toxicological thresholds to validate successful decon in the field



Effective, non-corrosive decontaminants for sensitive equipment, vehicles, and building interiors

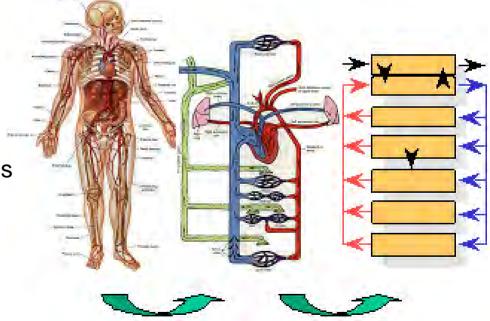


Threat Agent Science

- Current Efforts
 - Studying toxicological effects low levels of exposure to agents
 - Researching environmental fate of agent

Challenges

- Better fundamental understanding of CB agents
 - Physical and chemical properties
 - Fundamental interactions with other materials and environment
 - Pathological and toxicological properties
 - Exploitable signatures

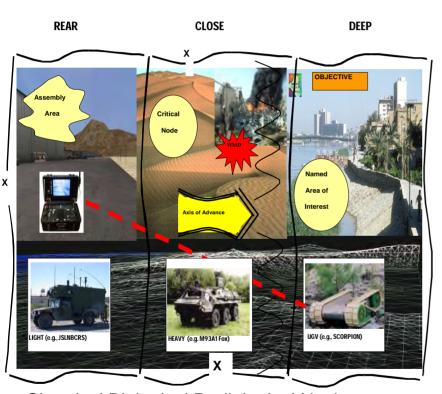


Improved CONOPS and a better understanding of CBrelevant science

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Technology integrated through joint experimentation



Chemical Biological Radiological Nuclear Unmanned Ground Reconnaissance (CUGR) ACTD



Contamination Avoidance at Seaports of Debarkation (CASPOD)





- Background
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Sustaining and improving S&T capability

- Intellectual capital
- Physical infrastructure







- Background
- Business strategy
- The S&T challenges
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- Conclusions





We are...



- Improving business strategy
- Bridging the "valley of death" between S&T and advanced development
- Emphasizing revolutionary technology
- Sustaining and improving S&T capability





Joint Combat Developer





Presented to:
Joint CBRN Conference
By
BG Lillie
Commandant, USACLMS







- Role of the Joint Combat Developer
- Mission
- Organization
- Chartered Work
 - Joint Experimentation and Analysis
 - Joint Threat Support
- DOTMLPF support to the CBDP
- Transforming to meet the Combatant Commanders Needs





Role of the Joint Combat Developer



CBDP Program Process & Organization



osp provides oversigh,

Combatant Commanders

Services













Joint Combat Developer

Joint Requirements Office (JRO)

Required Capabilities





















Test & **Evaluation**

S&T Gaps

Joint Science & **Technology Office** DTRA/CB

Joint Program Executive Office (JPEO)

Prioritized Needs

Mature Technologies







Implementation Plan for the Management of the Joint CBDP (Army as Executive Agent)



Para	Task
3.4.1	Coordinate and integrate research, development, test, and evaluation, and acquisition, requirements of the military departments for CBRN defense programs of the DoD (50 USC 1522). The Army will execute this function through sub-para 3.4.3 and 3.4.6 in the plan.
3.4.2	The Secretary of the Army as executive agent shall review all funding for the CBDP (50 USC 1522). The Army will execute this function through sub-para 3.4.3 and 3.4.5 in this plan.
3.4.3	Review and recommend approval of the CBDP POM.
3.4.4	MDA for delegated programs with authority for further delegation to the JPEO.
3.4.5	Serve as the Joint Service Material Developer to coordinate and integrate acquisition for the CBDP through the JPEO, who reports to the DAE through the AAE.
3.4.6	Provide Program, Analysis and Integration functions for the CBDP.
3.4.7	Provide the Testing and Evaluation Executive for the CBDP.
3.4.8	Through the JRO, serve as the Joint Combat Developer for the CBDP.



Mission Statement

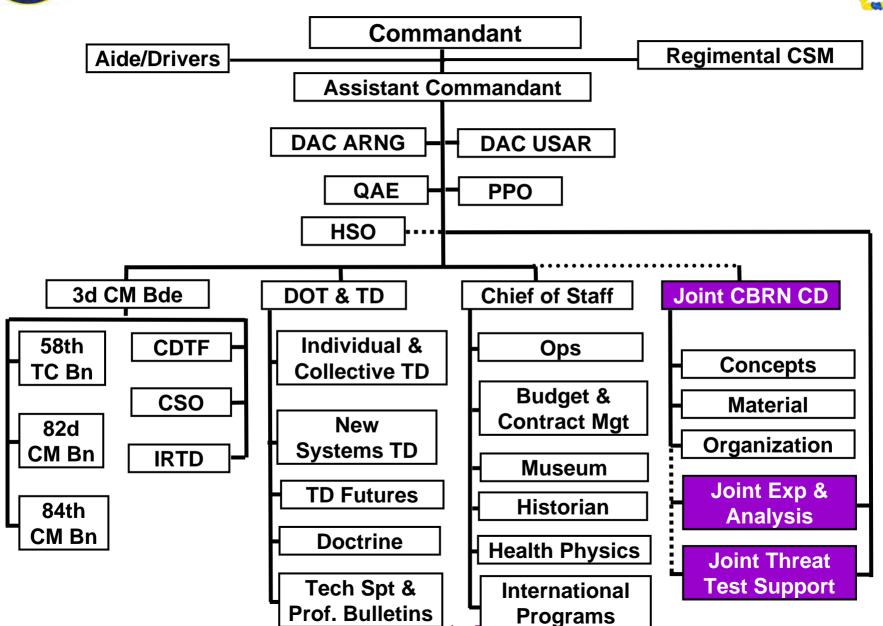


The USACMLS trains Joint and International CBRN Service members; develops leaders; supports training in units; develops multi-service and Army doctrine; builds the future CBRN force; and is the Joint Combat Developer for the Joint Chemical, Biological, Radiological and Nuclear Defense Program





U.S. Army Chemical School Organization





Joint CBRN Experimentation & Analysis



Complete

- 1. Split MOPP validate USAF CONOPs for Fixed Sites (Completed FY05)
- 2. Sensitive Equipment Decon validate CONOPS & KPPs (Completed FY05)
- 3. Cold Weather Decon Validate Cold Weather TTPs for WMD-CSTs (NGB Funded, Completed Mar 06)
- 4. Aerial CBRN Sensing develop & validate CONOPS (Completed Apr 06)



Split MOPP



- <u>Objective</u>: Investigate the applicability of USAF Chemical Defense Transzone Operations (CDTO) within the Counter-Chemical Warfare (C-CW) concept for use on Joint and Multi-Service fixed sites and determine DOTMLPF impacts of CDTO on Joint and Multi-Service fixed sites.
- First Joint CBRN Concept Experiment Performed for JRO-CBRND
- Location: McGuire Air Force Base
- <u>Recommendations</u>: Multi-Service and Joint fixed sites should adopt a modified version of the USAF C-CW CONOPS which provides for use of

multiple Contamination Control Areas for thorough decontamination as necessary.

• Result: Experiment conclusions on CDTO are currently being incorporated in the next revision of the Multi-Service TTPs for CBRN defense of theater fixed sites, ports, and airfields.





Sensitive Equipment Decon (SED)

- <u>Objective</u>: Determine adequacy of Service CONOPS and TTPs for use during thorough decon, compatibility of program KPPs and Service CONOPS, and operational suitability of SED prototypes and potential design changes
- First Joint Capabilities Experiment Performed for JPEO-CBD
- **Location:** Tyndal Air Force Base

• **Recommendations:** Modify program to address system transportability and US Army throughput requirements; reduce gross contamination through use of pre-

wipes, investigate future means to reduce absorption of contamination during immediate and operation decon, and investigate means to employ the technology in support of clearance decon.

• **Result:** Experiment conclusions on SED provided to JPEO-CBD which used them to help focus ongoing program efforts.





Cold Weather Decon

- <u>Objective</u>: Determine if decontamination of WMD-CST reconnaissance teams can be successfully conducted more efficiently with a decon trailer during extreme cold weather (less than -20° F) operations than with the current doctrinal wet decon process.
- First Joint Capabilities Experiment Performed for NGB
- Location: Cold Weather Chamber, New Hampshire; ...
- Recommendations: Doctrinal wet decon process is infeasible during extreme cold weather during high winds; with some engineering changes the trailer can

be used to decon the recon personnel; trailer can be decontaminated for multiple repeated use.

• Result: Experiment conclusions on cold weather decon for CSTs will lead to development of Capabilities Development Document to begin new program





Aerial CBRN Sensing

- <u>Objective</u>: Determine applicability and requirements for use of aerial platforms to support CBRN reconnaissance and surveillance and develop draft Service and Joint CONOPS and TTPs for tactical aerial CBRN sensing.
- First Joint Capabilities Experiment Performed for DTRA-STO
- **Location**: Crystal City, VA
- Recommendations: All Services can benefit from CBRN surveillance and reconnaissance; plug-n-play sensors lack adequate responsiveness; sensors must be miniaturized to reside on aerial platforms.
- Result: Experiment conclusions being provided to DTRA-STO to help focus future S&T efforts for sensor development and support for future possible ACTD.





Joint CBRN Experimentation & Analysis



FY06 Experiments In Progress

- 1. WMD-CST LOE Validate CST TDA (NGB sponsored)
- 2. Dismounted CBRN Recon validate equipment for JSLNBCRS Increment 2 CPD needed to support assessment of sensitive sites and interdiction (JPEO-CBD sponsored)
- 3. Air Crew Duration validate TTPs and aircrew safety requirements for fixed wing transport aircraft (TRANSCOM nominated)
- 4. Standoff Chemical Agent Detection Explore alternative technologies and applications (USMC nominated)



Joint CBRN Experimentation & Analysis

FY07 Experiments

- 1. Sensitive Site Assessment develop & validate CONOPS and TTPs (JRO-CBRND sponsored)
- 2. Robotic Decontamination develop & validate CONOPS and TTPs to modernize detailed equipment decontamination (JRO-CBRND & JPEO-CBD sponsored)
- 3. Joint Expeditionary Collective Protection validate CONOPs & develop KPPs for development of CDD (JPEO-CBD sponsored)
- 4. CBNEWS develop and validate CONOPS for using information from disparate non-CBRN sensors to tip and queue CBRN sensors (proposal for DTRA-STO sponsorship)



Joint Threat Support



Currently Standing up Joint Threat Support Branch (JTSB):

- Five intelligence specialists authorized
- Three of five positions filled
- Four by EOM August
- Responsible for System Threat Assessment (STAR) and Joint Test Threat Support Packages (JTTSP)

Products:

Seven JTTSPs outsourced to meet immediate requirements:

JSGPM JSLIST-JC3

JCAD JSLNBCRS LAV

JSLNBCRS HMMWV JBSDS

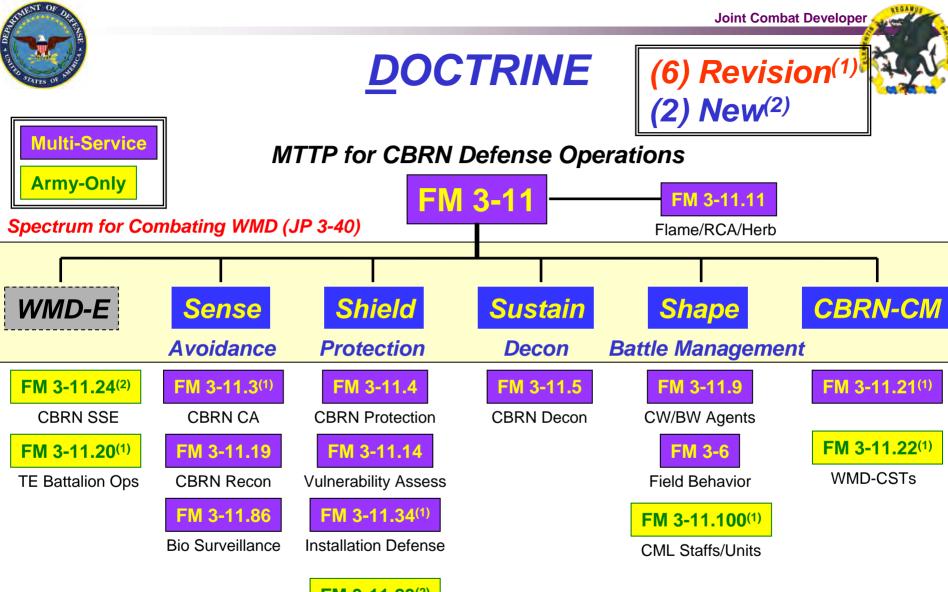
JBAIDS

- UCS TTSP pending JRO Director approval
- Tasked to produce STAR for MS A programs: JECP, JCBRAWM
- JTTSPs required for FY07 to follow STAR production





DOTMLPF Support to the CBDP



FM 3-11.23⁽²⁾

Installation Response

FM 3-11.50

Obscuration



TRAINING





Several courses at the USACMLS are Joint or Multi-service Examples

- Additional Skill Identifier- L5 (Fox Operators Course) Army & Marine
- Operational Radiation and Radiation Safe Courses Multi-service
- Chemical Captains Career Course Army & Marine
- Basic Noncommissioned Officer Course Army & Navy
- Civil Support Skills Course Army & Air National Guard
- Joint Senior Leader Course Joint, Interagency, and International
- Technical Escort Course Joint, Interagency, and International
- Chemical, Biological, & Radiological Defense Training Facility (CBRDTF) Joint, Interagency, and International

Strategy – All core courses being refocused to include hazardous materials and sensitive site exploitation skills



MATERIEL CREE



- Support to the CBDP
- All CBRN Programs are "Born Joint"
- 32 developmental programs
- Joint CBRN Combat Developer drafts new capabilities documents and supports J-8 JRO-CBRND through the Joint Capabilities Integration and Development System (JCIDS) process

Examples

JWARN – Joint Warning and Reporting Network

JCAD – Joint Chemical Agent Detector

JSLNBCRS – Joint Service Light NBC Reconnaissance System

JBPDS – Joint Biological Point Detection System

JSTDS-SS – Joint Service Transportable Decon System – Small Scale



LEADER DEVELOPMENT

oper

Support to the CBDP

Joint Training tailored to student experience level.

Example: CBRDTF – Sensitive Site Assessment/ Exploitation Training provides Basic, Intermediate and Advanced levels of training

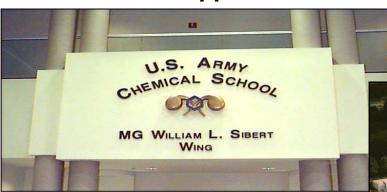






FACILITIES

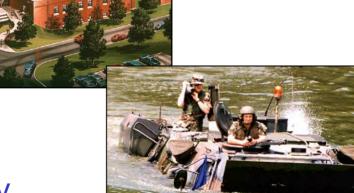
Support to the CBDP





- Radiological Laboratory

- BIDS Bunker Bio Defense
- FOX Den Chemical Recon
- Chemical Applied Training Facility
- Chemical Biological Radiological Defense Training Facility
- CBRN Responder Training Facility (Jun 07)
- Obscuration Ranges
- Flame Ranges



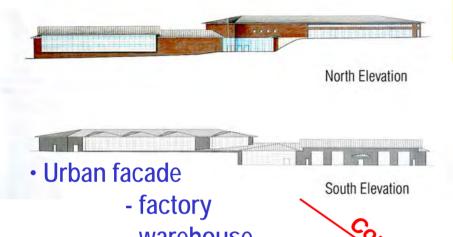


Joint Combat Developer



LT Joseph Terry CBRN Responder Training Facility





- warehouse
- postal building
(connected by tunnels)

- Intermodal containers and railcars
- Cave complex / Confined space



- Groundbreaking: June 05
- Completion: June 2007
- Responder Training
 - WMD Civil Support Teams
 - USAR Domestic Recon and Decon
- Sensitive Site Assessment and Exploitation
 - SF Chem Recon Det
 - Tech Escort







Transforming to Meet the Combatant Commanders Needs







- Requests from the Field
 - Enhanced Dismounted Recon to detect and identify full spectrum of battlefield hazards
 - Capabilities to assess Sensitive Sites
 - OCONUS Consequence Management capabilities

In the future, elements resembling <u>site assessment teams</u> or mobile collection teams <u>moving with the ground forces to provide initial assessments</u> of emerging ad hoc sites are likely to be important, but these elements needs to be more robust than the teams deployed in Operation Iraqi Freedom.

Quotes taken from Strategic Forum No. 211, Oct 2004, Institute for National Strategic Studies National Defense University, article titled: "Eliminating Adversary WMD: Lessons for Future Conflicts", by Rebecca K.C. Hersman and Todd M. Koca





QUESTIONS



OFFICE OF MILITARY COOPERATION - KUWAIT



KUWAIT Ministry of Defense (KMOD) Chemical Defense Program

MAJ Timothy J. Mertsock
US CBRNE Advisor
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OFFICE OF MILITARY COOPERATION - KUWAIT

CBRNE – 7/7



Last 7

Environmental issue - visited scrap yard with
 150 unknown pressurized cylinders to advise on further action

Next 7

- Assist with FMS Letter of Request signature by Director, Chemical Directorate (KMOD)
- Assist J2-Intelligence Chief with development of Crisis Management Center for KMOD.



OFFICE OF MILITARY COOPERATION - KUWAIT





- KMOD Chemical Defense Directorate Program
- CBRNE FMS Case (Future)
- Coalition Training Program: US CM CO to KMOD Chemical Defense Directorate
- Environmental / Radiation Protection
- Support to EAGLE RESOLVE Crisis Management





Department of Defense Chemical Biological Defense Program:

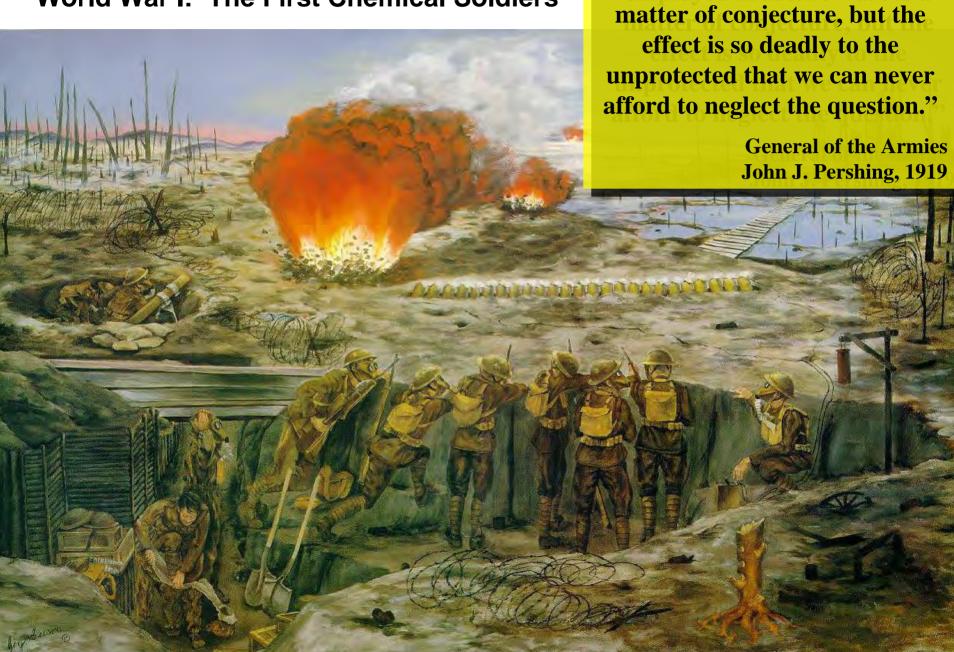
Integrating Joint Programs – Delivering Capabilities to the Joint Force

Mr. Jean Reed
Special Assistant for Chemical Biological Defense &
Chemical Demilitarization Programs

June 27, 2006

The Chemical Soldier (1919)

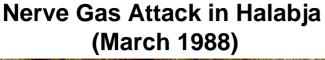
World War I: The First Chemical Soldiers

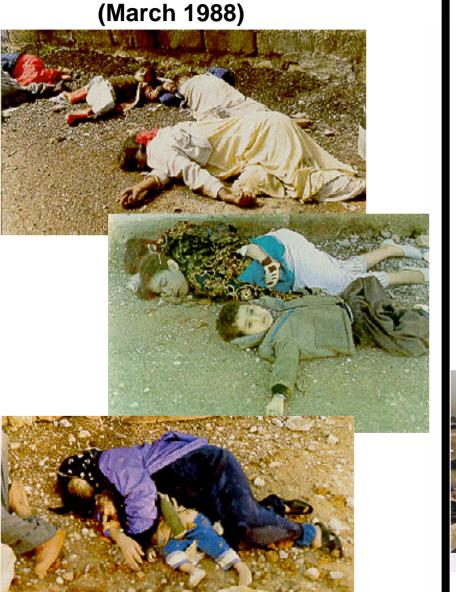


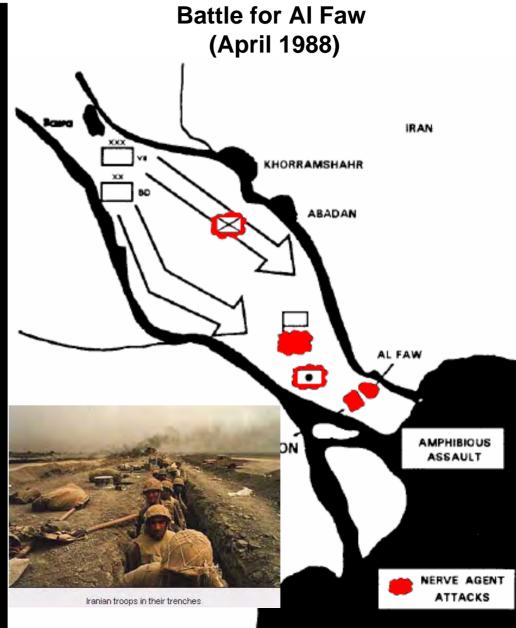
"Whether or not gas will be

employed in future wars is a

The Iraqi Use of chemical weapons drew widespread international attention to a threat that had been widely ignored.







The NBC Soldier (1990-91)

Operation Desert Storm















CB Defense Deficiencies Identified in Operation Desert Storm

Detection	Individual Protection	Collective Protection	Decon- tamination	Medical
 No Organic Communication Limited standoff detection Limited liquid agent detection Single biodetection technology Limited HD detection Limited recon No individual detectors High false alarm rate potential Slow response time to HQ 	 Masks Multiple masks for ground and vehicle functions Limited aviator masks Clothing Bulky Superactiviated charcoal Not launderable Bulky accessories 	 Few shelters Very limited integrated ship & vehicle protection Limited deployable collectively protected shelters for tactical applications 	 Corrosive decontaminants Environmentally hazardous sensitive equipment decon Limited personal decon Limited large area decon Water-based decontaminants Labor intensive 	 Limited BD vaccines (Anthrax and Bot IND) No CW prophylaxes Limited CW pretreatment Limited mustard agent pretreatment Limited medical training for casualty management Limited diagnostic capability



Chemical Biological Defense Program

- Established by Congress
 - FY 1994 National Defense Authorization Act,
 P.L. 103-160 (50 USC 1522)
- Addresses critical organizational and technical shortfalls identified following Desert Storm
 - Single consolidated DoD wide program
 - Oversight centralized for efficiency and effectiveness
 - Initially joint efforts focused on fielding initial biological detection capabilities and procurement of personal protective equipment

The Changing Nature of the Threat:

Non-Traditional Agents, Non-Traditional Delivery, and Non-Traditional Adversaries



CB Defense Deficiencies Addressed since Operation Desert Storm

Detection	Individual Protection	Collective Protection	Decon- tamination	Medical
 Improved Organic Communication Improved standoff detection Improved liquid agent detection Multiple biodetection Improved HD detection Improved recon No individual detectors Low false alarm rate potential Improved response time to HQ 	 Masks Joint masks for ground and vehicle functions More aviator masks Clothing Reduced Bulk Superactiviated charcoal (Carbon Spheres) launderable Integrated hood Improved quantities 	 Integrated ship & vehicle protection Improved quantities of deployable collectively protected shelters for tactical applications 	 Corrosive decontaminants Environmentally hazardous sensitive equipment decon Improved personal decon Limited large area decon Water-based decontaminants Labor intensive 	 Limited BD vaccines types (Anthrax and Bot IND, Smallpox), but improved supply Limited CW prophylaxes Limited CW pretreatment Limited mustard agent pretreatment Improved medical training for casualty management Genetic and assay-based diagnostic capabilities; Intheater capabilities



/ULNERABILITY

Defense Strategy

Security Environment: 4 Challenges

Higher 4

<u>Irregular</u>

Unconventional methods adopted and employed by non-state and state actors to counter stronger state opponents. (erode our power)

(e.g., terrorism, insurgency, civil war, and emerging concepts like "unrestricted warfare")

Lower

Traditional

States employing legacy and advanced military capabilities and recognizable military forces, in long-established, wellknown forms of military competition and conflict.

(challenge our power)

(e.g., conventional air, sea, and land forces, and nuclear forces of established nuclear powers)

Lower

Catastrophic

■ Surreptitious acquisition, possession, and possible employment of WMD or methods producing WMD-like effects against vulnerable, high-profile targets by terrorists and rogue states. (paralyze our power)

Disruptive

Higher

International competitors developing and possessing breakthrough technological capabilities intended to supplant U.S. advantages in particular operational domains.

(capsize our power)

(e.g., sensors, information, bio or cyber war, ultra miniaturization, space, directed-energy, etc)

LIKELIHOOD

No hard boundaries distinguishing one category from another

VULNERABILITY

Defense Strategy

Security Environment: 4 Challenges

<u>Irregular</u>



Higher Catastrophic



Lower

Traditional



Lower ▼

LIKELIHOOD

Disruptive

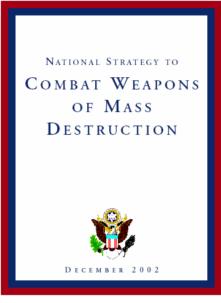


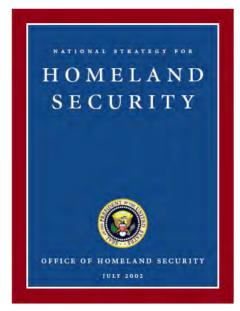
Higher

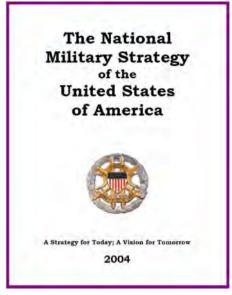
Key Strategic Guidance:

CBRN Defense is a Critical Component of National Strategies

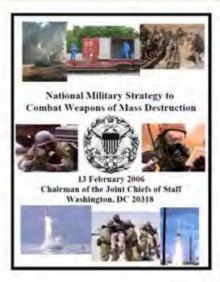


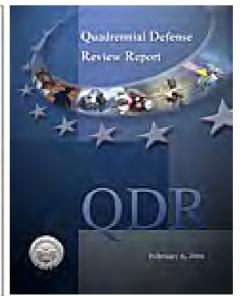


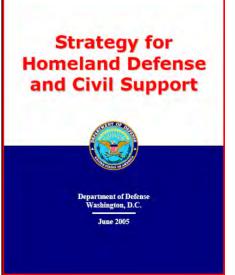








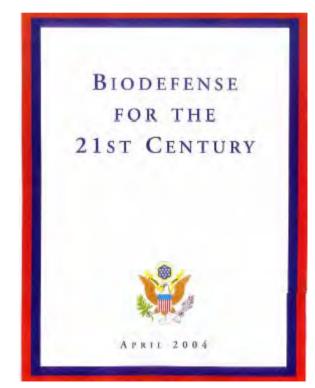




National Strategies Addressing Emerging Threats

Biodefense for the 21st Century, The White House, April 2004 (NSPD-33/HSPD-10)

- "Preventing and controlling future biological weapons threats will be even more challenging. Advances in biotechnology and life sciences including the spread of expertise to create modified or novel organisms—present the prospect of new toxins, live agents, and bioregulators that would require new detection methods, preventive measures, and treatments. These trends increase the risk for surprise"
- "The proliferation of biological materials, technologies, and expertise increases the potential for adversaries to design a pathogen to evade our existing medical and non-medical countermeasures. To address this challenge, we are taking advantage of these same technologies to ensure that we can anticipate and prepare for the emergence of this threat."



Quadrennial Defense Review (QDR):

Vision for Combating Weapons of Mass Destruction

The future force will be organized, trained, equipped, and resourced to deal with all aspects of the threat posed by weapons of mass destruction. It will have capabilities to:

- detect WMD, including fissile material at stand-off ranges;
- locate and characterize threats;
- interdict WMD and related shipments whether on land, at sea, or in the air;
- sustain operations under WMD attack; and
- render safe or otherwise eliminate WMD before, during or after a conflict.

The Department will develop new defensive capabilities in anticipation of the continued evolution of WMD threats. Such threats include ... genetically engineered biological pathogens, and next generation chemical agents. The Department will be prepared to respond to and help other agencies to mitigate the consequences of WMD attacks.

Quadrennial Defense Review (QDR):

Implementing the Combating WMD Vision

To achieve the characteristics of the future joint force..., the Department will:

- Designate the Defense Threat Reduction Agency to be the primary Combat Support Agency for U.S. Strategic Command in its role as lead combatant commander for integrating and synchronizing combating WMD efforts.
- Expand the Army's 20th Support Command (CBRNE) capabilities to enable it to serve as a Joint Task Force capable of rapid deployment to command and control WMD elimination and site exploitation missions by 2007.
- Expand the number of U.S. forces with advanced technical render-safe skills and increase their speed of response.
- Improve and expand U.S. forces' capabilities to locate, track, and tag shipments of WMD, missiles, and related materials, including the transportation means used to move such items.
- Reallocate funding within the CBDP to invest more than \$1.5
 billion over the next five years to develop broad-spectrum medical countermeasures against advanced bio-terror threats, including genetically engineered intracellular bacterial pathogens and hemorrhagic fevers.



CBDP Vision and Mission



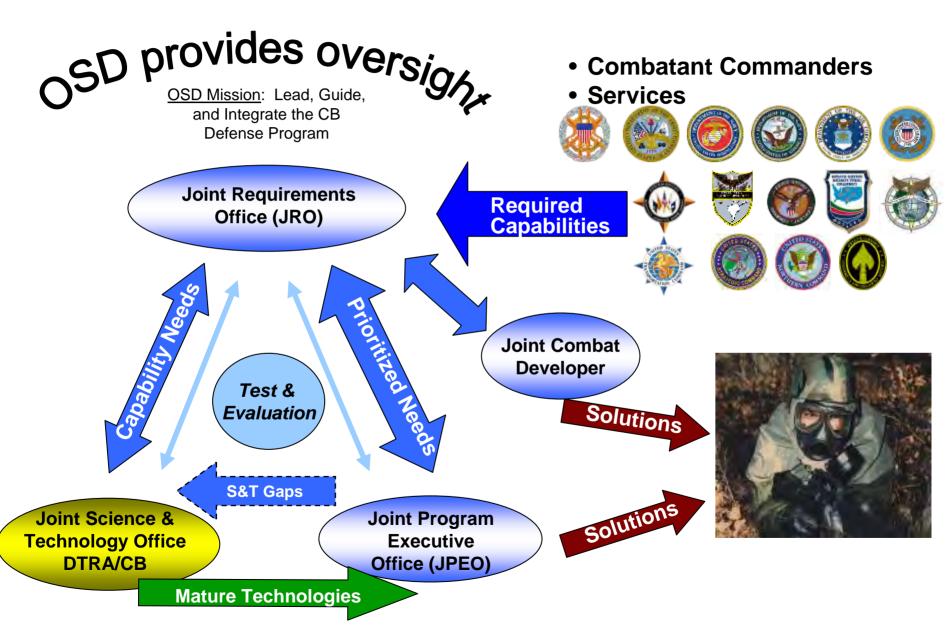
VISION

Combat weapons of mass destruction through a strong chemical biological defense program.

MISSION

Provide chemical and biological defense capabilities to effectively execute the *National Strategy for Combating Weapons of Mass Destruction*. Ensure all capabilities are integrated and coordinated within the interagency community.

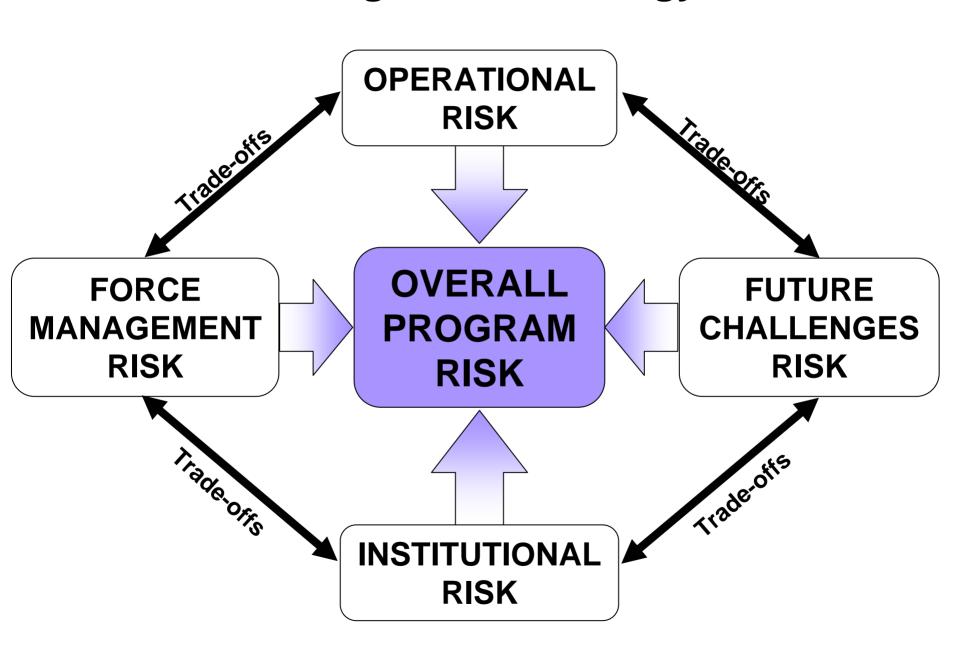
Program Process & Organization



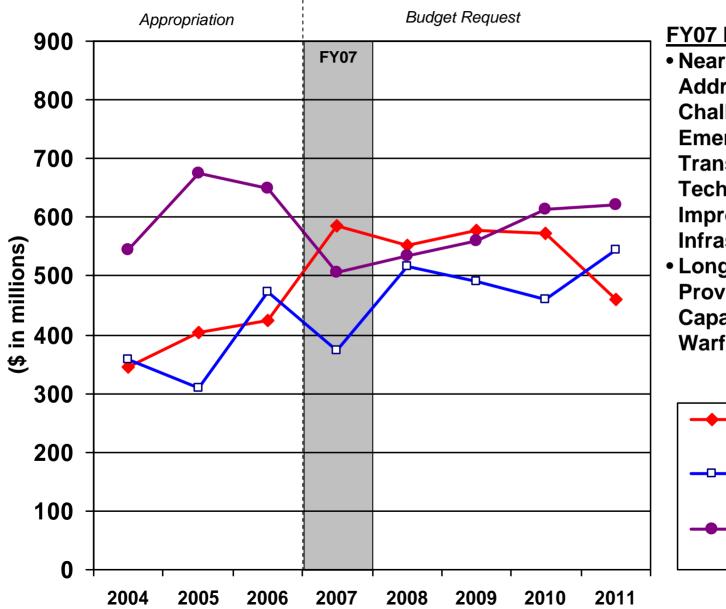
Interagency Activities

- CBDP Formally Coordinates With:
 - Counterproliferation Program Review Committee (CPRC)
 - Technical Support Working Group (TSWG)
 - Department of Homeland Security (DHS), Science & Technology Directorate
 - National Institute of Allergies and Infectious Diseases (NIAID)
 - Centers for Disease Control (CDC)
 - U.S. Coast Guard
- Various Levels of Coordination/Cooperation Exist with:
 - National Security Council
 - Office of Science & Technology Policy
 - Department of Health and Human Services (including the Food and Drug Administration, and the Centers for Disease Control and Prevention)
 - U.S. Department of Agriculture
 - Department of Justice

Managed Risk Strategy



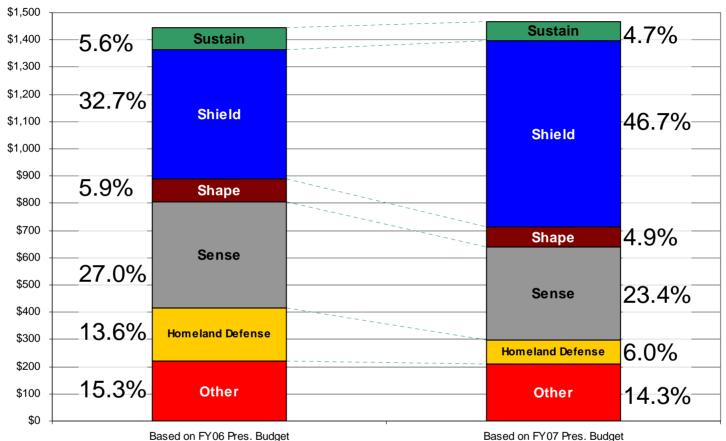
CB Defense Program Structure: FY2007 PB



FY07 Highlights

- Near-Term Emphasis to Address Future Challenges (NTAs, Emerging Threats, Transformational Medical Technologies) and Improve the T&E Infrastructure
- Long term trend to Provide Advanced Capabilities to the Warfighter

FY07 Resource Allocation: Shifting Priorities (Impact of the QDR)

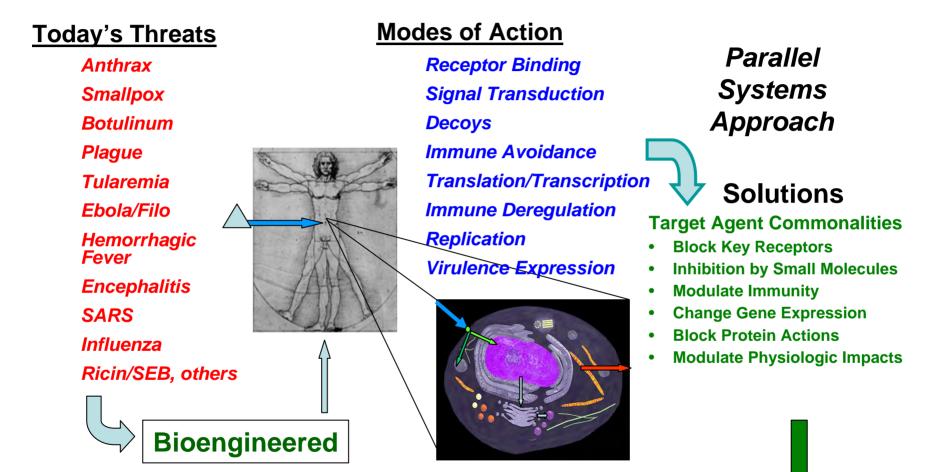


Funding shift to support the

Transformational Medical Technology Initiative (TMTI) Based on FY07 Pres. Budget

Based SITT FOT Tree. Budget		
	FY07 Budget Estimate	
	Based on FY06	Based on FY07
(\$ in Millions)	Pres. Budget	Pres. Budget
Other	\$221.2	\$209.7
Homeland Defense (HD)	\$195.6	\$87.7
Sense	\$389.5	\$342.2
Shape	\$85.1	\$72.3
Shield	\$471.6	\$684.5
Sustain	\$80.5	\$69.0
TOTAL	\$1,443.5	\$1,465.4 ₂₁

Medical Countermeasures Against Advanced Bio Threats



One *PIECE* at a time — Process Analysis — Broad Spectrum

TMTI Strategy Components

- Systems biology Integrates molecular and informatics
- Identified multiple scientific proven approaches
 - Genomics
 - Sequencing, resequencing, genomic inhibition
 - Proteomics
 - Antibodies against broadly conserved processes
 - Immune Products
 - Specific technologies under consideration
 - Metabolomics
 - Too early to apply
- Industry/Academic partners
- "DARPA-esque" execution
- Deliverables:
 - Two or more broad-spectrum therapeutics
 - Genomic sequences of all pertinent known threats
 - Platform for rapid response (characterization and manufacture of countermeasure against unknowns

CBRN Education, Training, and Exercise Integration

MISSION

Lead and guide the integration of the DoD CBRN Defense Program Education and Training Initiatives

<u>VISION</u>

A comprehensively educated and trained Nation unified to effectively manage CBRNE threats.

- Near-term goals (1-2 yrs)
 - Identify DoD CBRN Defense Education & Training Initiatives
 - Assess and Prioritize Gaps
 - Synchronize DoD CBRN Education and Training at all levels
- Long-term goals (3-5 yrs)
 - Expand initiatives to address broader set of threats and missions:
 - Combating WMD (including interdiction, elimination, and other mission elements)
 - CBRNE: (include "E" High Yield Explosives)
 - Expand integration to include Federal Interagency's education, training, & exercise activities

CBDP: The Way Ahead

Need to build on current strengths...

- Integrated collection of systems
- Multi-disciplinary approaches
- Well developed doctrine and concepts for the military in operational environments

...while recognizing a changing environment

- Laboratory and other infrastructure may need overhaul
- Operational environment must consider homeland
 - > DoD now a key player, but no longer the biggest investment
- Emerging and non-traditional threats may be critical
- Congress will continue to play an active role
- Industry may be increasingly important, though DoD-unique assets need to be identified and maintained

CBDP: The Way Ahead

- ...and Planning for the Future
 - Need to balance investment between current risks (operational and procurement needs) and future risks (S&T and infrastructure)
 - Coordination with other agencies (DHHS, DHS, and others) for an effective national effort
 - DoD may play key role in transitioning technologies from laboratory concepts to field-ready systems, especially medical systems
 - Broad-spectrum, dual-benefit approaches will need to be evaluated in all areas

Back up slides

Offsets to Fund Broad Spectrum Therapies for Novel Biodefense Threats

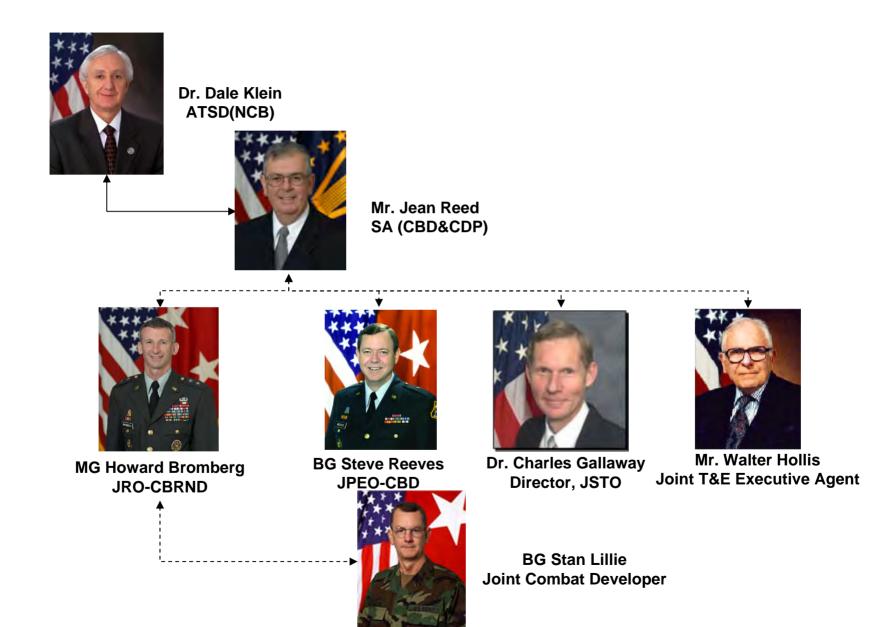
- Reduced activities in core CBDP (\$510M)
 - Identified efforts within the program that were sent back to the tech base for further development
 - Reduced procurement of consumables that were beyond initial issue
 - Reduced medical biological S&T activities made less necessary by broad spectrum efforts
- CBDP Installation Protection Program (IPP) (\$760M)
 - \$535M in CBDP procurement and \$225M in Services O&M
 - IPP is being incorporated into an integrated national response capability with the DHS
 - Post-Katrina experience shows we must be fully part of the integrated response, and not just a base response
 - Revised IPP plan due to DEPSECDEF June 2006
- The Secretary identified an additional \$230M to complete funding our minimum requirement.

Broad Spectrum Therapies for Novel Biodefense Threats

- \$100M funding in FY06 Down Payment
- \$225M in FY07 Funds Leading Edge Investment
 - 100% in Science and Technology
 - Transformational Approaches will be applied leverage genomics, proteomics and systems biology data explosion
 - Technical and program leadership from team of nationally recognized experts
 - BW defense, microbiology, drug development
 - Will draw heavily from commercial and academic performers
 - Investment provided by offsets in procurement (primarily the Installation Protection Program and transfers from related science & technology investments

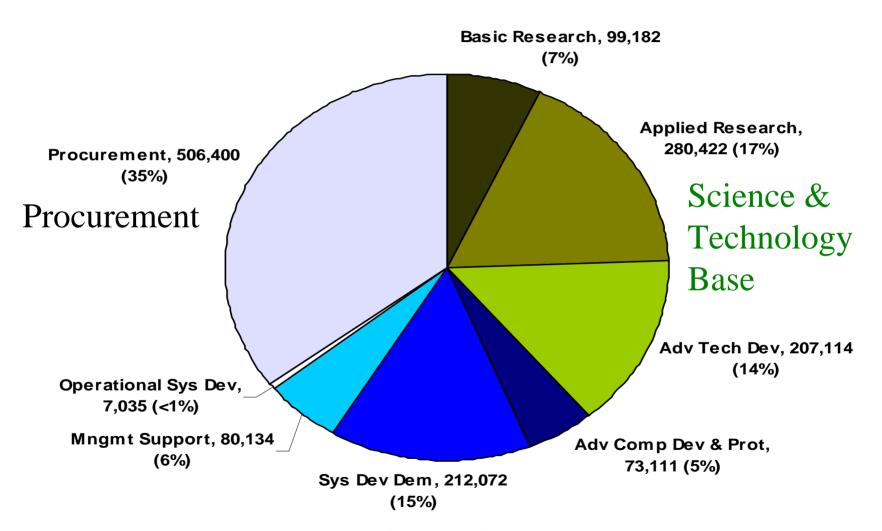
Goal: Defeat of genetically engineered biological threat

CBDP Major Players



Chemical Biological Defense Program

Based on FY07 President's Budget Request (February 2006) \$1.465 Billion



Advanced Development

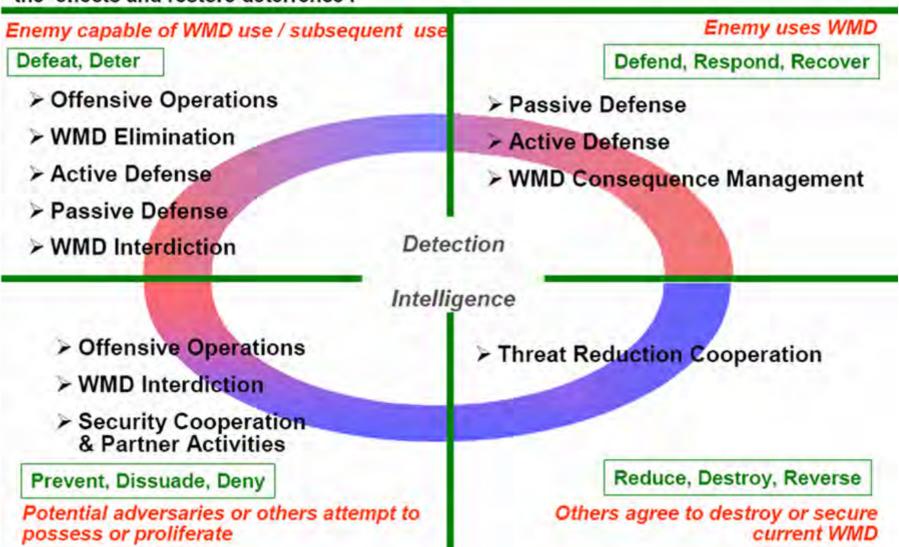
Force Planning Construct

2006 Quadrennial Defense Review

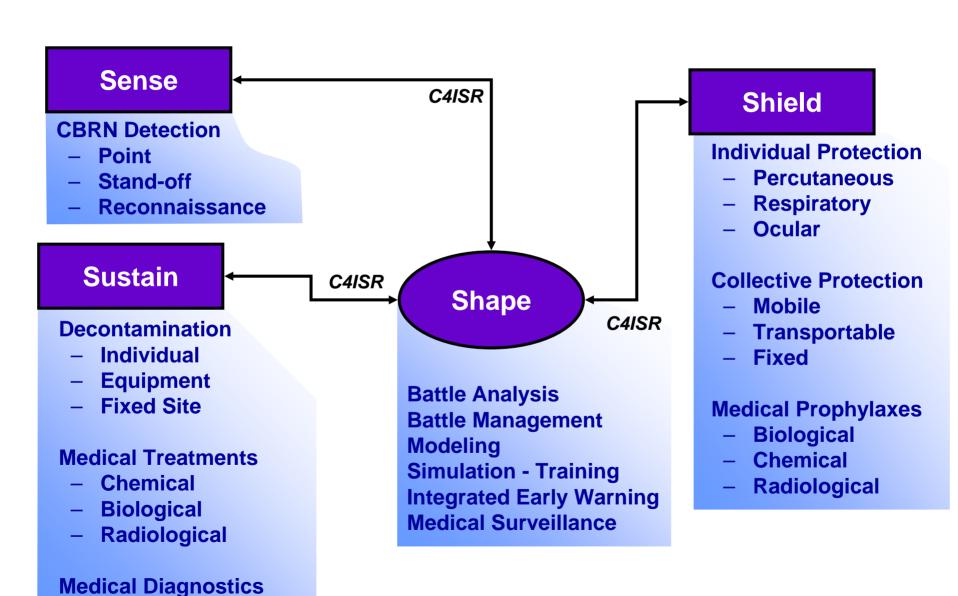
Steady State Surge Homeland Active Partnering Consequence Defense with USG Agencies Management Global Deterrence Interdiction War on Terror / Active Partnering Irregular Warfare & Tailored Shaping Counterinsurgency Stability Operations Train & Equip Information Operations Transnational Foreign Internal Defense Deterrence WMD Elimination Conventional Major Combat/Strike Active Partnering Stability Operations Campaign(s) & Tailored Shaping Reconstruction Support Cons. Management Forward Presence Regional Information Operations Deterrence

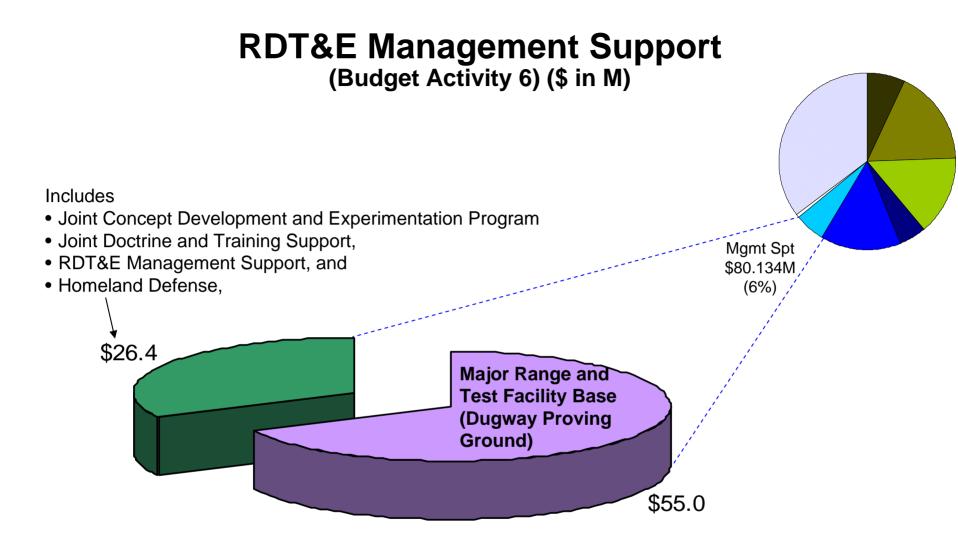
Combating WMD Mission:

Mission: Dissuade, deter, defend against & defeat those who seek to harm the United States, its allies and partners through WMD use or threat of use, and, if attacked, mitigate the effects and restore deterrence.



CBRN Defense Operational Elements and Capabilities





Management account provides critical support for T&E Infrastructure in accordance with FY05 Statute to fund MRTFBs.

Broad Spectrum Therapies for Novel Biodefense Threats

Basic Research (BA1) \$51M

- Directed at critical pathways in pathogen & host response
- Identify the novel points of intervention

Applied Research (BA2) \$109M

- Expand technologies Microfluidics, nanotech, modeling
- Develop artificial cell/artificial tissue models

Advanced Technology Development (BA3) \$65M

- Expand drug discovery efforts & evaluate additional compounds
- Develop transgenic animal models or alternate animal model systems
- Enable rapid regulatory approval and rapid clinical development

Basis for Broad Spectrum Therapies for Novel Biodefense Threats

- Biodefense 2020 Relman Panel
 - Highlighted the threat
- National Intelligence Estimate
 - Characterized the bioengineered threat
- Enhanced Planning Process
 - -Identified FY06 funding for modest initiatives
- QDR analysis and recommendations
 - Established comprehensive solutions
- Interagency review
 - Scientifically feasible and executable
- Department QDR decision \$1.5B

Installation Protection (Guardian) Study

- Study will develop the following
 - Prioritized list of US military installations
 - Associated CBRNE capabilities packages for installation protection (IP)
 - Funding guidance to build and sustain an enhanced IP capability
- Focus of study
 - Utilizing both military and civilian assets for mission assurance against a range of CBRNE threats
 - How to make military assets available for civilian consequence management at local, regional and national levels

Products

- Area Analysis Findings
- Needs Analysis Findings
- Solutions Analysis Findings
- Revised CBRNE IP plan to DEPSCEDEF 30 June 2006

QDR Built on Last Year's Enhanced Planning Process (EPP)

Areas of Additional Emphasis

Infrastructure	RDT&E
Improvements	Improvements
 CB T&E Facilities NTA Test Chamber USAMRIID (DHP) 	 S&T for NTA detection Bio detection Medical Prophylaxis Battle Analysis Decontamination Bio Defense Initiatives Chem detection



UNCLASSIFIED

Joint Program Executive Office for Chemical and Biological Defense

PRESENTED TO:

Joint CBRN Conference Fort Leonard Wood STEPHEN V. REEVES
Major General, USA
Joint Program Executive Officer
for Chemical and Biological Defense
(703) 681-9600



Joint Program Executive Office for Chemical and Biological Defense

Mission

The Joint Program Executive Office for Chemical and Biological Defense is Responsible for Research, Development, Acquisition, Fielding, and Life-cycle Support of Chemical, Biological, Radiological, and Nuclear (CBRN) Defense Equipment, Medical Countermeasures, and Installation and Force Protection Supporting the National Military Strategy





What We Do Every Day

Support Current Operations

Improve Current Systems

Build the Future



What Have We Done for You Lately

Fielding 30 Chem Bio Defense Systems in FY06-07



Major New Fieldings: FY06-07

- Joint Service Chemical Environment Survivability Mask
- Joint Service General Purpose Mask
- Joint Service Decon System Small Scale
- Joint Service Personnel Decontamination System RSDL
- Joint Biological Agent Identification & Diagnostics System
- Joint Service Mask Leakage Tester
- Joint Effects Model Block I
- Joint Service Light Nuclear, Biological, Chemical, Reconnaissance System



Sixteen (16)

Joint Effects Model (JEM)



Joint Biological Agent Identification & Diagnostics System (JBAIDS)



Joint Service Chemical Environment Survivability Mask (JCSEM)



Joint Service General Purpose Mask (JSGPM)



Joint Service Transportable Decon System-Small Scale (JSTDS-SS)



Joint Service Light Nuclear, Biological, Chemical, Reconnaissance System (JSLNBCRS)



Joint Service Chemical Environment Survivability Mask (JCESM)

Potential Non-combatant Replacement for M-17

- Milestone C January 2006
 - Low Rate Initial Production (LRIP) Approved 19K Masks
 - Unit Cost Under \$100.00
 - Funded to Procure 193K Masks





Individual Protection Fielding for FY06 & 07











System (AFS)

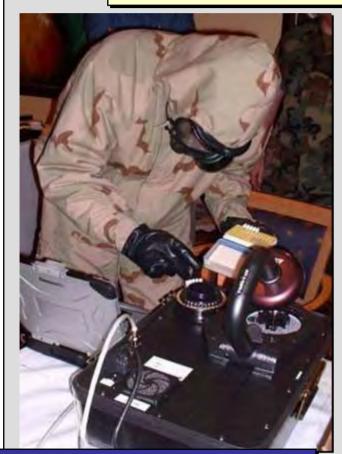






Chemical Biological Medical System Fielding for FY06 & 07

336 JBAIDS



Joint Biological Agent Identification and Diagnostics System (JBAIDS)



Air Force Floats

ONC Training

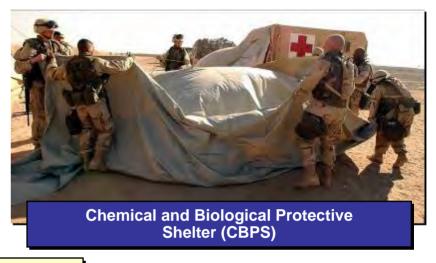
ARMY Depot Spares

Navy



Collective Protection Fieldings for FY06 & 07





All Services

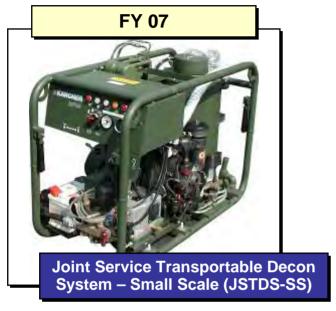




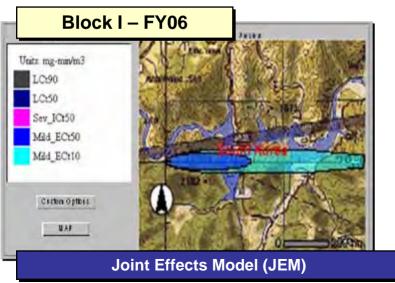
Not Shown: Shipboard Collective Protected System (CPS)

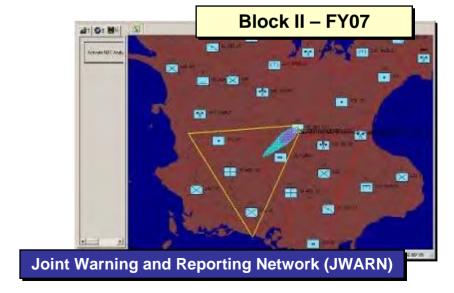


Other Fieldings for FY06/07











Delivering SOCOM Capabilities





Supporting GWOT



Life Cycle Management: RESET

RESET: Equipment Deployed in OEF/ OIF Identified as Requiring Depot/ Contractor Repair

- Leveraging Service O&M
- Coordinating Required Contractor Support
- Synchronizing Repairs With MWO's and Technology Insertion

Example Systems:

- M17/ M12 Decon Apparatus
- M21 Remote Standoff Chemical Agent Alarm
- M22 Automatic Chemical Agent Detector and Alarm
- FOX NBC Reconnaissance Vehicle
- Chemical Biological Protective Shelter



Fox NBC Reconnaissance Vehicle Survivability Upgrade

- Meets Operation Iraqi Freedom Urgent Need
 - Improved RPG Protection: Slat armor
 - Improved IED Fragmentation Protection
 - Up-gun to M2 Machine Gun
 - Common Remotely Operated Weapon System (CROWS)
 - VIC III Communications Installed at the Same Time





Up-Armor Protection for the Warfighter

Department of the Army Guidance:

"...armor all tactical wheeled vehicles (TWVs) deployed in support of OIF/OEF..."

Three CBRN Systems Redesigned:

Chem-Bio Protective Shelter (CBPS) Biological Integrated Detection System (BIDS) M56, Coyote, Smoke Generator



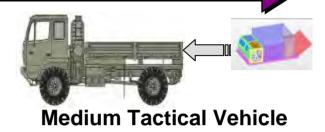
Up-Armor Solutions

Current

Future



Chem-Bio Protective Shelter (CBPS)





Biological Integrated Detection System (BIDS)





M56 Coyote, Smoke Generator

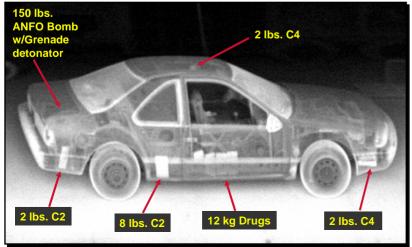


Up-Armored HMVVW



Z-Backscatter Van

- Mobil X-Ray System in Commercial Van
 - Scan for Explosives, Weapons, Drugs / Contraband
 - Two-person Crew; Remote Operation at 0.5 Km Standoff







Joint Acquisition CBRN Knowledge System (JACKS)

- CBD Equipment
 - -Characteristics
 - Advisory Messages
 - -Shelf Life
 - -Safety Messages
 - -Training
 - -Quality Control
 - -Access to JTAVRW



Available to All DoD Personnel with a Common Access Card

Sign In at:

https://jacks.jpeocbd.osd.mil



JPEO-CBD Web Site

- Organization & Contact Info
- Reports (Hotline, Surge, etc.)

 Product Fact Sheets & Brochures Non Standard Equipment Process

CBD Quarterly Magazine

News & Events

New Equipment Training

Hot Topics

Safety Messages

- Links
- Regionalization Position Info
- Photo Gallery
- Contact Us

http://www.jpeocbd.osd.mil -or-

https://secureweb.hqda.pentagon.mil/jpeocbd_secure



Software Support Activity (SSA)

A Single Activity to:

- Support Integration Interoperability Using a Common CBRN Architecture
- Define CBRN Standards and Protocols
- Verification, Validation and Accreditation
- Ensures CBRN Software Compliance with DoD Standards



Help Desk Call Center 877 328-0371 or DSN 524-4684

Help Desk Web Access https://sskc.spawar.navy.mil/



Synchronizing Near Term Needs



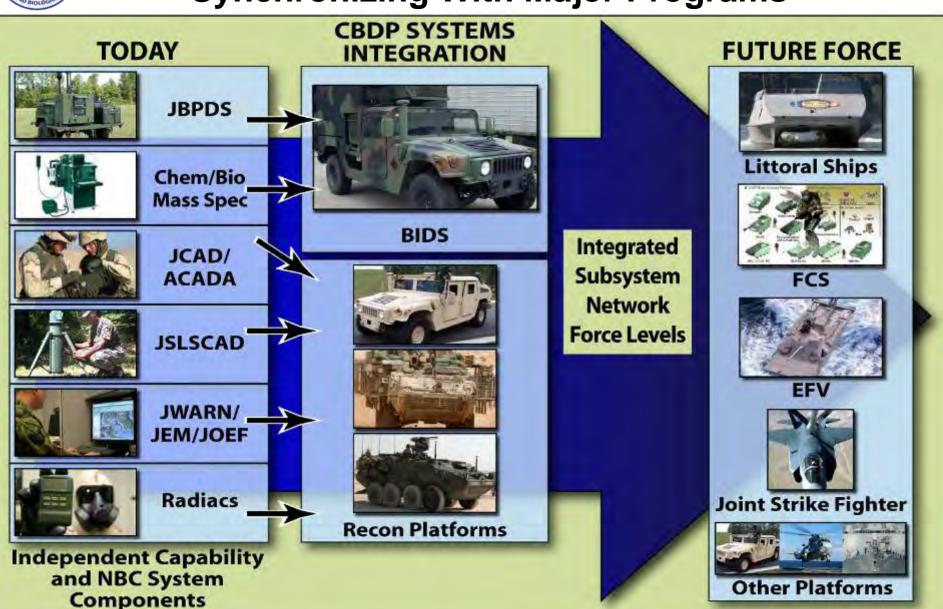
Synchronization

 Synchronize and Integrate the Interdependent Program Segments in a Dynamic Systems of Systems, Networked Environment

- Networked Systems, Technology and Standards Evolve
 There will Never be a Stable Environment/ Requirements, Even in Full-Rate Production
- Total Life Cycle Management, Including Logistics, Training, Industrial Base, Readiness Improvements are an Integrated Part of Our Planning, Resourcing and Execution



Synchronizing With Major Programs



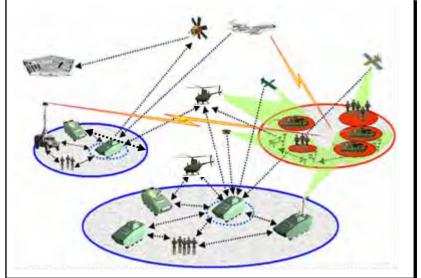






- Net-Centric CB Defense Architecture
 - A family of Integrated Systems (Sensors, Information Systems, Protection Systems, Consequence Management Tools)
 - Continual or On-demand Access to Data Through Various Ports and Peripherals on the network
 - Shared Awareness, Increased Speed of Command, and Self Synchronization
 - Interoperable and Seamless Capability that Provides Exponentially Increased Military Benefit to Those Systems/Soldiers that Otherwise Operate Independently



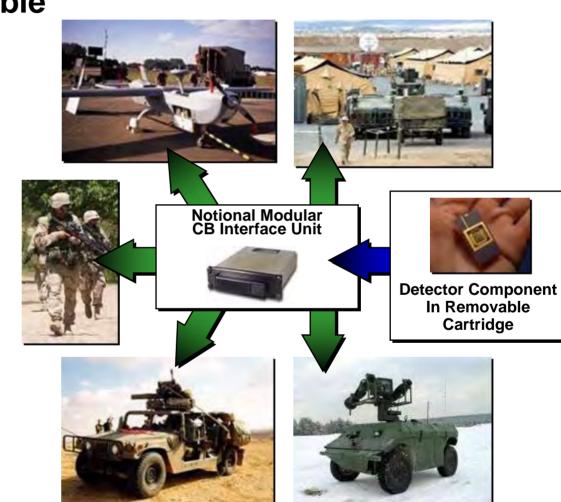




 Modular and Tailorable Sensor Systems

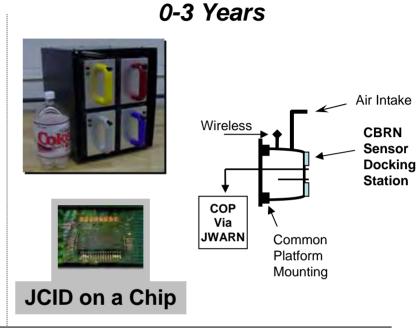
- Two Key Parts:
- Multipurpose,Inter-changeableDetectors
- Common Interfaces
 - Mechanical
 - Power
 - Communication
 Signal and Protocols











7-15 Years







Today's Functional Demo



Joint Warning and Reporting Network



LAN

Identifinder



HOLSTER LAN connection



JWARN on C2PC

Wireless

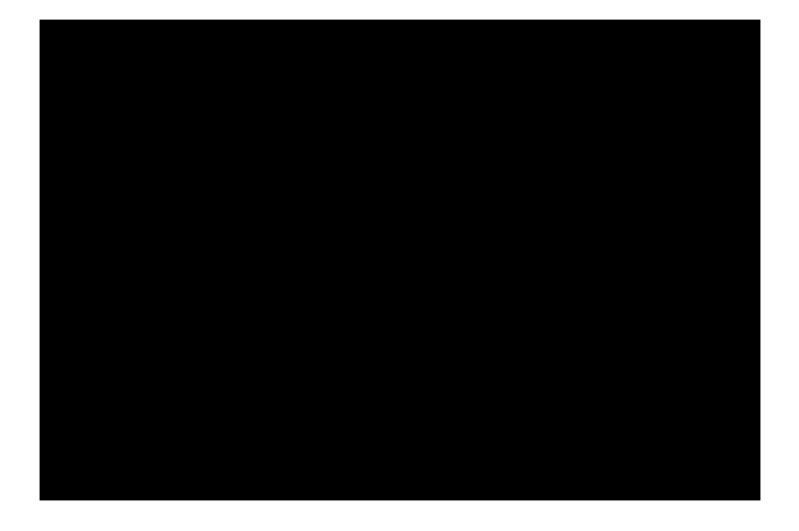
card

ADM300 Sensor Simulator

Sensor interface and other CB apps

Wired & Wireless
Communication
to JWARN







Limited Objective Experiment (LOE) Net-centric/Modular Demonstration

Oct-Nov 2006, Aberdeen Proving Ground, MD

JCID on a chip, PDA, and/or other comm. components



Network Capable Wireless Capable GPS Capable

Laptop for user interface, data access, and sensor

Sensors repackaged for optimal form, fit, and function "Holster" Rack for universal plug & play and battery recharge



<u>Network</u>



management



Net-Centricity... Modularity ... Tailorability
We Need Your Input!

What's Good / What's Bad?

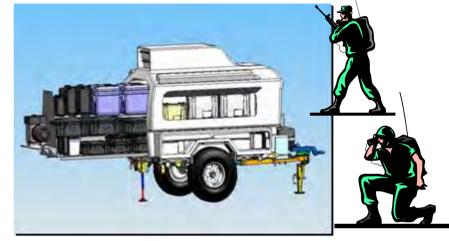
What Common Interfaces Make Sense?

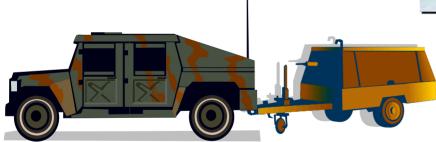
How Do we Drive Technology to Meet Future Concepts?



Joint CBRN Dismountable Reconnaissance System Limited Objective Experiment

Identify Light CBRN Detection and Identification Equipment Sets for Mounted and Dismounted Reconnaissance





Demonstrate Net-Centric/Modular Sensor Concept Capabilities





Joint Expeditionary Collective Protection (JECP) Limited Objective Experiment



Examine Collective Protection Concepts of Operation for Expeditionary Forces



Joint CBRN Aerial Sensing Payload (JCASP) Limited Objective Experiment

Assess the Utility of Using CBRN Sensors on Unmanned Aerial Vehicles to Conduct Recon Operations





Sensitive Equipment Decontamination (SED) Limited Objective Experiment

Assessed Prototype Systems and Procedures for Decontaminating Sensitive Equipment







Other Limited Objective Experiments

Cold Weather Decontamination Trailer (FY06)

WMD Civil Support Team (CST) Duration (FY06)

Aircrew Duration in Protective Ensemble (FY06-07)

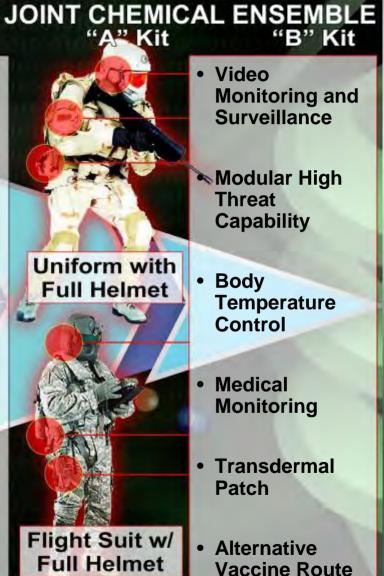
Robotic Decontamination (FY07)

Sensitive Site Exploitation (FY07)



Warrior as a System





 Video Monitoring and Surveillance

"B" Kit

Modular High **Threat** Capability

Body Temperature Control

Medical **Monitoring**

 Transdermal **Patch**

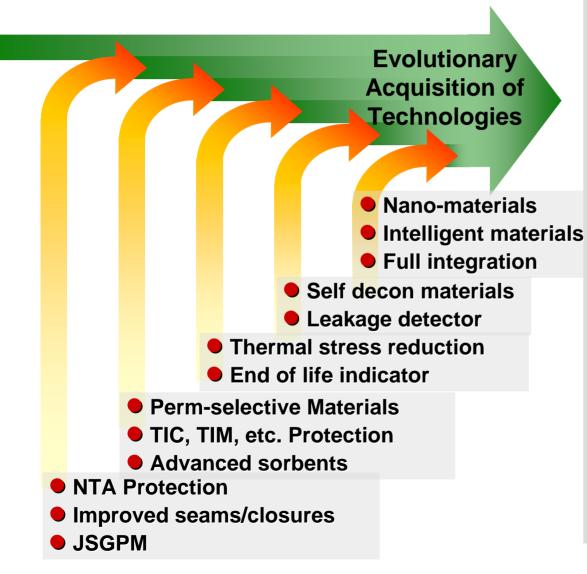
 Alternative **Vaccine Route**

062706 Joint CBRN Conference



Joint Chemical Ensemble

Next Generation Protective Ensemble





Joint Chemical Ensemble

- Cool & Lightweight
- CB Protective
- Standard duty uniform
- Increased mission duration
- Reduced logistics burden
- Fully integrated w/ mask, boots, gloves, helmet, body armor & weapons
- Reduced doffing hazard



Future Challenges

- Constrained Financial Resources
 - Balancing Near-Term Operational Needs and Preparing for Future Threats

 Expanded NBC Capability for Army Brigade Combat Teams

NBC Capabilities for Major Combat Systems

• Properly Equipping the Force for Expanding Mission Sets

Better – Faster – Cheaper

Joint Program Executive Office



Chemical and Biological Defense

USAMRMC Capabilities to Support the Chemical and Biological Defense Program

presented to

Joint CBRN Conference and Exhibition

by

James A. Romano, Jr.
Deputy Commander
US Army Medical Research and Materiel Command

Organization USAMRMC and the Chemical Biological Defense Program

Oversight & Coordination

Assistant to the Secretary of Defense (Nuclear and Chemical and Biological Defense Programs)

Defense Acquisition
Executive

Special Asst for Chemical and Biological Defense & Chemical Demilitarization Programs

Army Acquisition Executive

Program Management

DTRA – USAMRMC MOA

Execution

Defense Threat Reduction Agency – CB Directorate
[Joint Science & Technology Office for Chemical Biological Defense]

Joint Program
Executive Office Chemical Biological
Defense

HQ USAMRMC Frederick, MD

U.S. Army Medical Research Institute of Chemical Defense (USAMRICD) Edgewood, MD U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) Frederick, MD Walter Reed Army Institute of Research (WRAIR) Silver Spring, MD

USAMRMC Laboratories *Key Role in Product Development*

Research



Increased

Investments

Since FY02

- NIAID
- Universities
- Industry
- DHS
- DOE
- DOD

Product Testing



Development





Vaccines

Efficacy Testing



Pharma Industry

Bioshield Increases \$\$ Incentives to Manufacturers

Drugs

USAMRMC Unique Strengths

- Large scale medical product testing capability
- · High containment labs and animal facilities
- Aerosol challenge for large studies
- FDA regulated safety and efficacy



U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID)







Unique Expertise

- 34 years of experience safely handling the world's deadliest pathogens in biocontainment
- Most of the Nation's experts in infectious aerosols work at USAMRIID
- Most of the Nation's subject matter experts on biological threats

Facilities

- Aerobiology labs
- Biosafety Level (BSL)-4 labs
- The "Slammer" The only BSL-4 patient care suite in the Nation

Capabilities

- Large-scale testing and evaluation of medical product evaluation in animal models
- Aerobiology
- Animal Models and Pathogenesis
- Outbreak investigation/support
- Definitive I.D. of new threats/bioforensic analysis

Part of a national system of medical countermeasure development

USAMRIID Activities

Recent/Pending Transitions

- Recombinant staphylococcal enterotoxin A and B (SEA/SEB) vaccine candidates
- Vaccine candidate V3526 (multivalent VEE vaccine candidate)
- Recombinant protective antigen (rPA) anthrax vaccine candidate
- Immunologically and nucleic-acid-based medical diagnostics (reagents, protocols and devices) for JBAIDS

Current Efforts

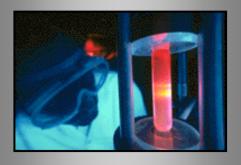
- Recombinant ricin vaccine candidate
- Alternative vaccine delivery methods for application with rPA,
 SEB, and F1-V plague vaccine candidates
- Oral form of cidofovir for smallpox pre-/post-exposure treatment

Partnering

- 126 active CRADAs
- 377 active Material Transfer Agreements







U.S. Army Medical Research Institute of Chemical Defense (USAMRICD)

Unique Expertise

- Neurotoxicology
- Skin protection and decontamination
- Medical management of chemical casualties

Facilities

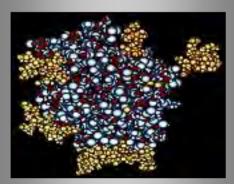
- Chemical surety facility
- Neurophore electrocorticographic recording system
- Nerve/muscle physiology testing facilities
- Molecular modeling and genomic analysis systems

Capabilities

- Drug discovery and preclinical development
 - Nerve agent pretreatments and therapies
 - Vesicating agent therapies
 - Non-traditional chemical threats
 - Biological neurotoxins
- Biomedical sample analysis for CW agent exposure







USAMRICD Activities

Recent Transitions

- Plasma-derived nerve agent bioscavenger
- Oxime Replacement for 2-PAM

Current Efforts

- Recombinant nerve agent bioscavenger
- Vesicant countermeasure candidates
 - Chemical scavengers
 - Anti-inflammatories







U.S. Army Center for Environmental Health Research (USACEHR)



Facilities

- Building 568
- Renovations Completed 2005 (>\$13.5 M in Renovation)
- Well Water Supply
- 33,402 ft²

Capabilities

- Molecular Toxicology
- Mass Spectrometers
- Extensive Analytical Chemistry/Protein Chem
- Complete Aquaculture Facilities
- AAALAC International Accredited







USACEHR Activities

Recent Products

- Intelligent Automated Biomonitor System
- Coliform Analyzer

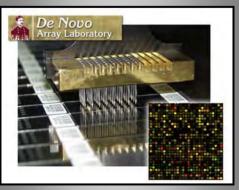
Future Products

- Environmental Sentinel Biomonitor
- Biomarkers
- Integrated Diagnostic Device



Walter Reed Army Institute of Research (WRAIR)





Expertise

- Vaccine and drug discovery and development
- Molecular biology of bacterial, viral, and parasitic pathogens
- Neuroscience

Facilities

- Vaccine Pilot-Scale Production Facility
 - Current Good Manufacturing Practice/Good Laboratory
 Practice-compliant operations
 - Viral, bacterial, and recombinant vaccines
- De Novo Microarray Laboratory
 - Production of custom cDNA print microarrays for analysis of gene expression and translation

Capabilities

- CW drug discovery and preclinical development
- Vaccine scale-up

WRAIR Activities

Recent Transitions

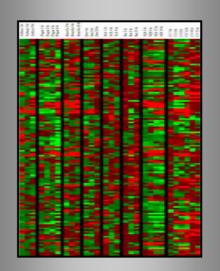
 Plasma-derived nerve agent bioscavenger

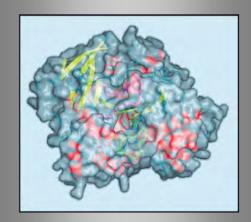
Current Efforts

- Host gene expression responses to biothreat agents
- Botulinum neurotoxin therapeutics
- Prophylactic skin patch vaccine for ricin
- Recombinant nerve agent bioscavenger

Partners Needed

Skin/wound decontamination







For the USAMRMC, protection of the Homeland against BioWarfare threats means the National Interagency Biodefense Campus (NIBC)

THANK YOU



Colonel Patrick Sharon Deputy Director for Counterproliferation Policy Office of the Deputy Assistant Secretary of Defense (Combating WMD and Negotiations Policy)



to
Joint CBRN Conference, Fort Leonard Wood, MO
27 June 2006



Building International Partnership Capacity

- □ A key theme in the Quadrennial Defense Review
- □ Targeted efforts to improve the collective capabilities and performance of the Department of Defense and its partners
- □ Partners include domestic and international
- Partnership capacity includes preventing hostile states and non-state actors from acquiring and using WMD

Our Goal – support and enable partnerships to improve policy, planning, and execution of national and homeland security missions



National Military Strategy to Combat WMD

Military Strategic Goal

Ensure that the United States, its Armed Forces, *allies, partners, and interests* are neither coerced nor attacked by enemies using WMD.

Military Strategic Objectives

Defeat and Deter

Defend, Respond and Recover Reduce, Destroy or Reverse

Prevent,
Dissuade or
Deny

Strategic Enablers

Intelligence

Strategic Communications Support

Partnership Capacity

Military Mission Areas

Offensive operations

Elimination operations

Interdiction operations

Active Defense

Passive Defense

WMD Consequence Management

Security Cooperation & Partner Activities

Threat Reduction Cooperation



Ongoing and Growing Efforts - Highlights

- □ Pacific region
 - Korea, Japan, Singapore
 - Multinational Planning Augmentation Team
- NATO and Europe
 - Multinational CBRN Defence Battalion
 - Czech Centre of Excellence
- Middle East and Southwest Asia
 - Cooperative Defense Program
 - Eagle Resolve

Contact Information



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National Guard Consequence Management Capabilities

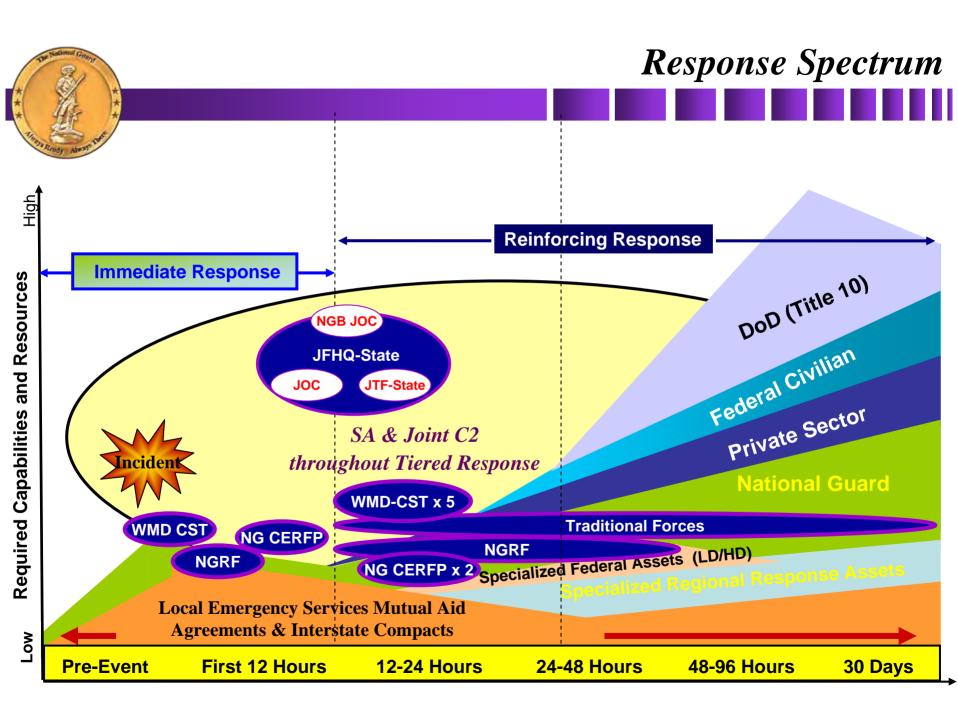
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MISSION: The National Guard Bureau (NGB), with support from selected States, conducted a National Guard Collective Training Exercise, Vital Guardian, vicinity RFK Stadium, Washington, DC on 4 APR 06 to highlight National Guard capabilities to a target audience and provide States with a collective training event.

Who:

- MI Joint Task Force State (JTF- State) / Commander
- NY Critical Infrastructure Protection-Mission Assurance Assessments (CIP-MAA)
- VA Weapons of Mass Destruction Civil Support Team (WMD-CST)
- WV CBRNE Enhanced Response Force Package (CERF-P)
- MD National Guard Response Force (NGRF)
- DC ARNG Joint Force Headquarters State / First Responders (JFHQ)
- Training event driven by DHS scenario #1 modified to a .5 KT device





National Guard Capability In Each State

- Joint Force Headquarters (JFHQ)
 - Provides pre designated JTF command elements for C2
- Weapons of Mass Destruction Civil Support Team (WMD-CST)
 - Assists in restoring government function by:
 - Providing reconnaissance
 - Identifying chemical, biological, radiological hazards
 - Establishing interoperable reach back communications
 - Advising local incident command with Nuclear Science Officer expertise and predictive modeling
 - Assisting local incident command with asset requests
- National Guard Response Force (NGRF)
 - Provides security force
- Traditional forces to perform traditional roles



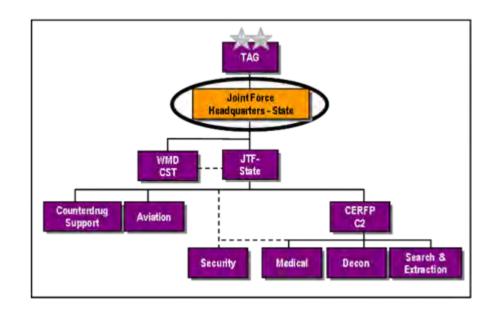
National Guard Regional Capability

- CBRNE Enhanced Response Force Package (CERFP)
 - Designed for immediate regional response
 - Trained in extraction from collapsed structure
 - Provides decontamination of casualties
 - Provides medical support integrated with decontamination
- Counter Drug
 - Provides aerial (136 aircrafts) and ground (11 Light Armored Vehicles) reconnaissance
 - Infra-red and live video capability
- National Guard Communication Element
 - Provides interoperable communications by bridging DoD and local responders



National Guard Joint Force Headquarters

- Integrated in every state and territory
- JFHQ in each state acts as conduit for integration of all available National Guard forces
- JFHQ in each state provides joint reception, staging, onward movement and integration of inbound forces
- JFHQ in each state assigns Joint Task Forces to provide regional command and control



National Guard Intent



- Purpose: The National Guard provides timely DoD Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives consequence management response to assist civil authorities of the affected states to establish control of the situation, save lives, mitigate human suffering, and facilitate response operations.
- Key State Tasks:
 - Provide mutual aid between supporting and affected States
 - Provide joint receiving, staging, onward movement, and integration (JRSOI) for inbound and outbound DoD forces in affected States
 - Joint Force Headquarters (JFHQ) appoints Joint Task Force State (JTF State) commander

National Guard Intent



Key NGB Tasks:

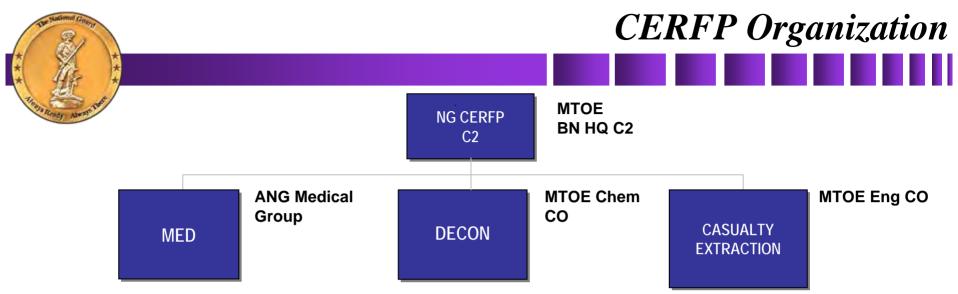
- Assist affected State Adjutants General in coordinating RFAs,
 RFIs and RFFs to support civil authorities
- Be prepared to react quickly to support the incident with National Guard unique domestic response capabilities
 - Joint Force Headquarters State (JFHQ State)
 - Weapons of Mass Destruction Civil Support Teams (WMD-CSTs)
 - CBRNE Enhanced Response Force Package (CERFP)
 - National Guard Response Force (NGRF)
- Advise States on other available military capabilities
- Develop Common Operating Picture (COP)
- Provide Situational Awareness (SA) of National Guard forces to the Joint Staff and USNORTHCOM



Provide:

- A regional Task Force with the capability to perform patient/casualty decontamination, medical triage and treatment and to locate and extract victims from a contaminated environment in support of civil or military authorities
- A response to fill the 6 72 hour gap in capability
 Note: In an immediate and unplanned response to the 9/11 attack, hundreds of NY guardsmen self reported to their armory within the first hour
- M-Day (traditional Guard) status until activated
- Utilization in State Active Duty, Title 32 or Title 10

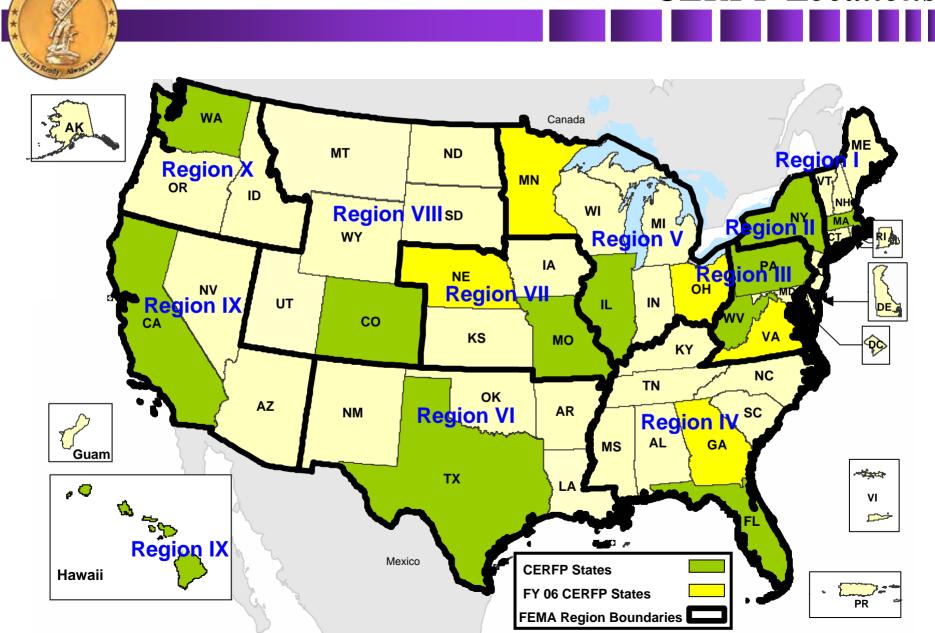
CJCSI 3125.01: Chief, National Guard Bureau (NGB), will: Monitor and assist the Adjutants General and the State National Guard in providing well-trained and well-equipped Army and Air National Guard forces and resources to provide military support to domestic CM operations in response to a CBRNE situation.



- This capability is dual mission and modular
- Units provided additional specialized equipment and training to perform operations in a WMD environment
- 14 additional days per year over the
 39 days of statutory training
- Receive search and extraction training and meet NFPA certification to operate in confined space collapsed structure

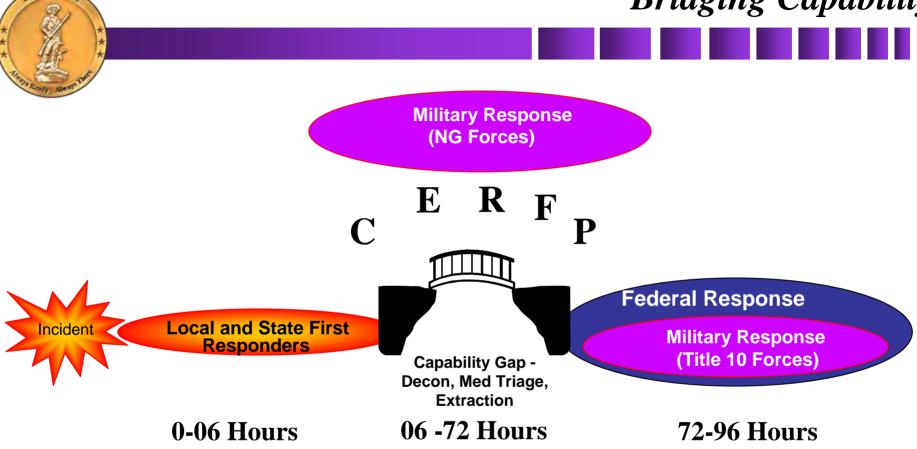
- Passed external evaluation conducted by 1st and 5th Army
- Specialized equipment meets
 NIOSH/OSHA standards
- Units trained to operate within the National Incident Management System
- HAZMAT trained IAW NFPA 472 standards
- At least one NG CERFP in each FEMA Region

CERFP Locations

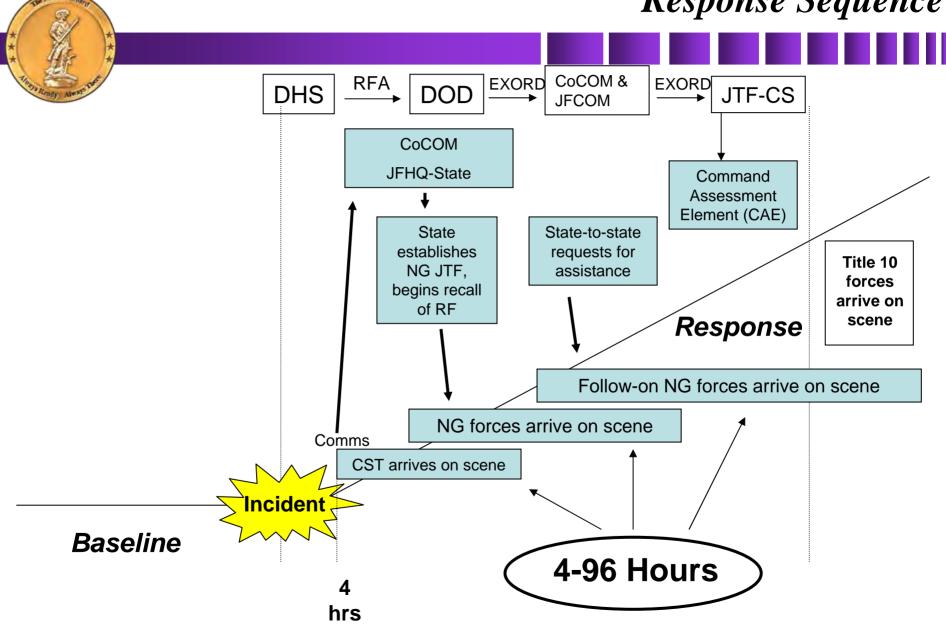




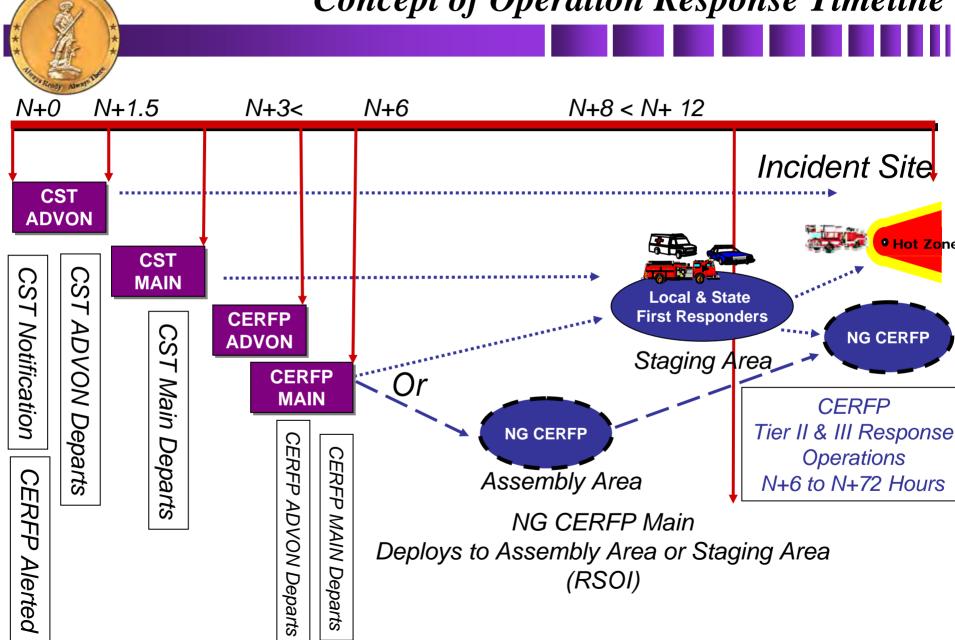
Bridging Capability



Response Sequence



Concept of Operation Response Timeline





- JFHQ Joint Operations Centers continue to improve linkage with State Emergency Operations Centers in each State
- NGB JOC and JFHQ JOCs integration continues to mature
- CERFPs will expand from 12 to 17 directed in the FY 06 National Defense Authorization Act
- 36 WMD-CSTs currently certified with remainder (19) to be certified by
 31 December 2006
- Continue to coordinate with interagency to improve overall response
- Continue to exercise with USNORTHCOM
- JROC validated the need and solutions (JROCM pending):
 - NG CERFP
 - JFHQ-State (JTF-State, JOC, NG Comm Element)

55 WMD CSTs by 31 December 2006 17 CERF-Ps by MAR '09



Questions and Answers

NG CERFP Casualty Extraction







Skeds: minor injury - minimum distances **Wheeled litters** – reduces effort over
longer evac distances **Mobile**: evac for the seriously injury

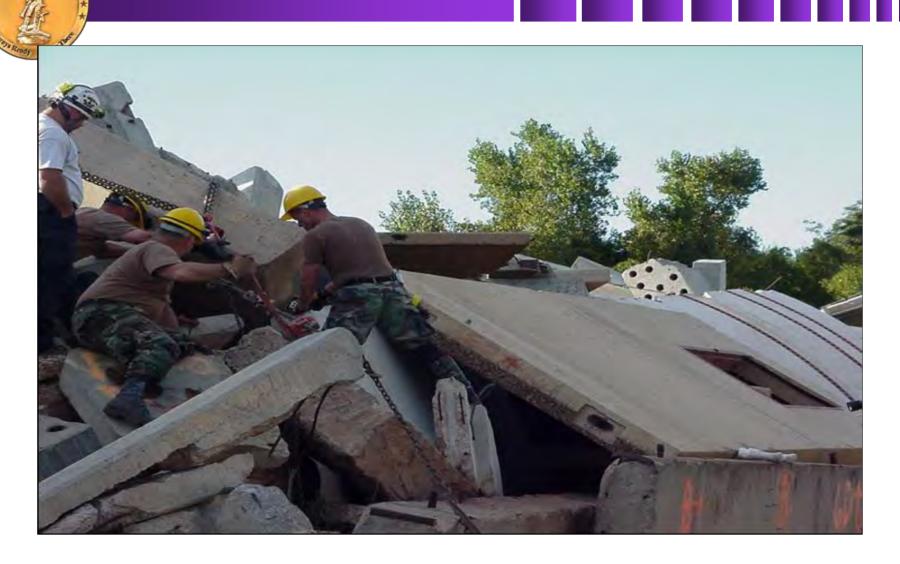




Searching Under the Rubble Pile



Stabilizing the Extraction Point











Extraction Course Medical Team Training







Extraction Course Medical Team Training





Extraction Team PPE





PAPR (Powered Air Purified Respirator)

- Provides user with constant, filtered airflow and positive pressure
- Reduces inhalation hazards







- Magnifies faint or distant sounds
- Can hear sounds 100 yards away
- Tape record what you hear
- Adjustable volume
- Automatic safety shutoff at 95 decibles
- Powered by 1.9 volt battery
- Battery last approximately 40 hours
- Total weight 28oz
- Uses include search and rescue, law enforcement, personal security



Thermal Imaging Camera



- 30 second Start Up time
- Human Size Target Detection Range-1200'
- Video Output to Television
- Rechargeable 6VDC-4 Included
- Standby mode
- Battery life 3hrs plus
- Weight 2.3 Pounds
- Tripod Mountable
- Thermal Images through walls can assist Search And Rescue teams in locating victims, can detect high heat output; I.e. fires, can detect personnel behind walls that may pose a threat to NGCERFP personnel





Patient Decon Equipment





Shelter and Roller Systems











Ambulatory Decontamination: Monitoring Lane



TX-NG CERFP

This briefing is unclassified



Back-ups

This briefing is unclassified



CST Organization

Commander & Deputy

Unit Commander (O-5)

Deputy Commander/ Operations
Officer (O-4)

Operations Team

Asst Operations Officer (O-3) Senior Operations NCO (E-8) Operations NCO-Modeling (E-7) Asst Operation NCO (E-6)

Administration & Logistics Team

Logistics NCO (E-7) Admin NCO (E-5)

Communications Team

Communications Team Chief (E-7) Information Sys Operator (E-6)

Medical Team

PhysicianAss#Nurse(O-4)
Medical Ops Officer (O-3)
NBC Science Officer (O-3)
Medical NCO (E-7)

Survey Teams

Survey Team Leader (O-3)

NBC Reconnaissance NCO (E-7)

- 2 Asst NBC Reconnaissance
- 4 Asst NBC Reconnaissance

WMD-CST & NG CERFP Contrast



WMD-CST

- FAD 2 Unit
- Army Executive Agent for the Program, funded by Army throughout the POM
- Equipment and 22 full time AGRs documented on an approved Army TDA
- 36 Certified Teams; 19 Teams Standing-Up in FY05/FY06
- DoD certifies to Congress the teams are trained organized and equipped

NG CERFP

- Task Force organized from existing units within 12 States
- Established and sustained using existing NGB resources
- No Separate TDA--Letter from NGB authorizing USPFOs to maintain the specialized equipment
- NGB Working with NORTHCOM/PACOM to document requirement in the COCOM Integrated Priority List (IPL) and JCIDS Processes (DOTMLPF)

Concept of operations



- Three Phases of National Guard Response:
 - Immediate Response: Affected State internal response
 - Reinforcing Response: Integration of National Guard or other
 DoD assets from outside the affected state
 - Transition: Recovery of supporting assets back to home station
- Command and control built on State resources in all states and territories (JFHQ State)
- Response built on current available National Guard forces in CONUS



- Immediate Response:
 - JFHQ JOC is notified of CBRNE incident and provides SA to NGB JOC
 - JFHQ assigns Joint Task Force (JTF) Commander(s)
 - N+90 Minutes WMD-CST Advon deploys
 - N+3 hours Entire CST deploys
 - N+4 hours NGRF deploys
 - TAG deploys any regional assets under his control
 - N+6 hours CERFP deploys
 - JCCSE and Counter Drug assets deploy
 - JFHQ establishes JRSOI for inbound and outbound forces



Reinforcing Response:

- JFHQ JOC publishes RFAs and RFFs for National Guard supporting state assistance
- Joint Force Headquarters (JFHQ) Joint Operations Center publishes RFIs required to support incident response
- NGB Joint Enabling Teams (JETs) deploy to affected states
- NGB facilitates resolution of RFAs, RFIs and RFFs (Troops to Tasks)
- TAGs of supporting states deploy assets to affected state
- JFHQ sustains forces by rotation to meet constraints on supporting states
- NGB maintains COP and SA through NORTHCOM & NMCC
- NGB assists in integration of Title 10 forces



- Transition (to state and local responders):
 - JFHQ releases forces to return to home state as tasks are completed
 - NGB assists JFHQ in recovery of DoD Title 10 Forces
 - NGB facilitates resolution of RFAs, RFIs, and RFFs
 - NGB maintains COP and SA through NORTHCOM
 - NGB recalls JETs as necessary
 - JFHQ releases State forces from JTF upon mission completion

National Guard Forces will arrive in the affected area immediately and remain until all tasks are complete





NG CERFP METL

Deploy the NG CERFP

Conduct Force Protection

Conduct NG CERFP Operations

- Supporting Battle Tasks
 - Conduct Search and Extraction
 Operations
 - Conduct Medical Operations
 - Conduct Decon Operations

Conduct NG CERFP Sustainment Operations

Conduct NG CERFP Recovery Operations

NG CERFP STAFF METL

Perform RSOI of the NG CERFP

Conduct mission planning

Conduct C3 Operations



MISSION

On order, respond to a Chemical, Biological, Radiological, Nuclear, or High Yield Explosive (CBRNE) incident and assist local, state, and federal agencies in conducting consequence management by providing capabilities to conduct **personnel** decontamination, emergency medical services, and casualty search and extraction.

CJCSI 3125.01: Chief, National Guard Bureau (NGB), will: Monitor and assist the Adjutants General and the State National Guard in providing well-trained and well-equipped Army and Air National Guard forces and resources to provide military support to domestic CM operations in response to a CBRNE situation.



NG CERFP Medical Element (SPEARR)

- ANG Medical Group, 45 personnel
- Small-Portable-Expeditionary-Aeromedical-Rapid Response

(EMEDS-Expeditionary Medical Support)

SPEARR is the first Module of the EMEDS

• Provides: Triage, Emergency medicine, critical care stabilization, Emergency surgery, patient prep. for Evacuation.

TRIAGE - PATIENT DECON - STAGING

Combating WMD Joint CBRN Conference 2006 Fort Leonard Wood

REDUCTIO)

Dr. James A. Tegnelia, Director,
Defense Threat Reduction Agency and
USSTRATCOM Center for Combating
WMD





- Combating WMD Strategic Framework
- USSTRATCOM and DTRA Responsibilities
- Programmatic Response
- The Future Our People





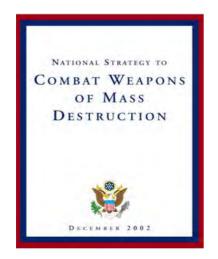
Combating WMD Strategic Framework

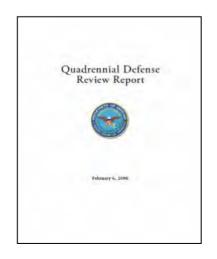


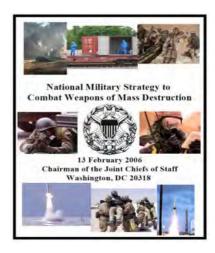
Guidance for combating WMD



- National Strategy for Combating WMD 2003
- National Implementation Plan 2006
- National Military Strategy for Combating WMD 2006
- CONPLAN 8099 2006
- Quadrennial Defense Review and Strategic Planning Guidance - 2006



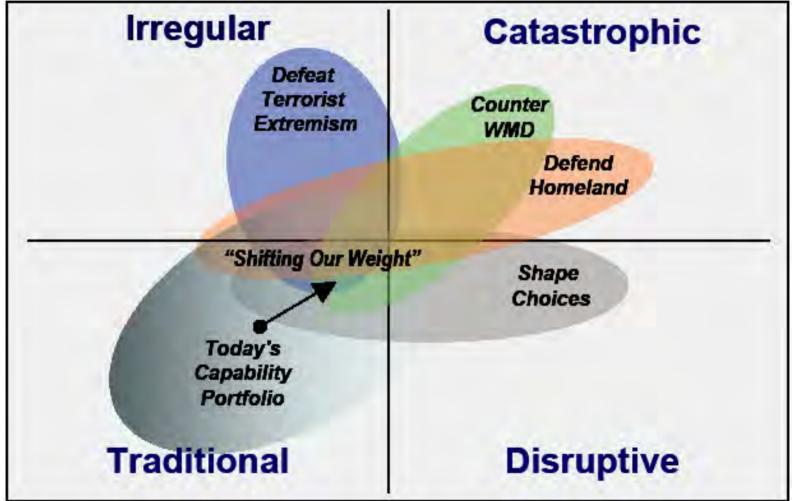






A strategic shift in focus



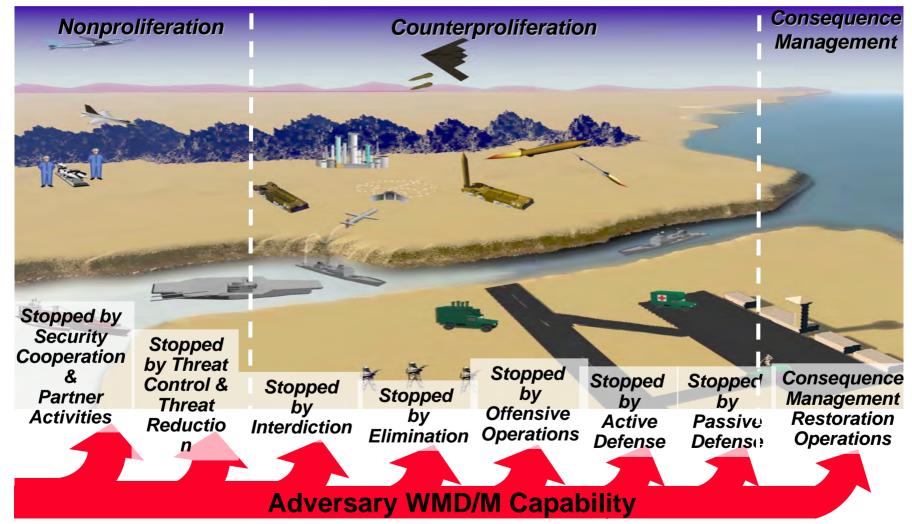


Continuing the reorientation of military capabilities and implementing enterprise-wie reforms to ensure structures and process support the President and the warfighter



National Strategy: a layered defense







New emphasis in combating WMD



- From predictability to surprise and uncertainty
- From focus on protecting the force to protecting society at large
- From military operations to integrated interagency activities employing all elements
- of national power
- From direct US military action to building partner capabilities
- From responding after action starts to anticipatory actions as a means to dissuade and deter





USSTRATCOM and DTRA Responsibilities





USSTRATCOM – then & now



1956



Largest COCOM HQ
Single mission focus
Internal focused planning
Supported for single mission
execution
Deterrence through retaliation

2006



Small HQ staff
Multi mission focus:
 enable JFCCs
Collaborative/adaptive plans
Focused on providing
capabilities to COCOMs
Broad mission areas
Broad spectrum influence

Accelerated transformation to strengthen the joint warfighter...

TED STATES

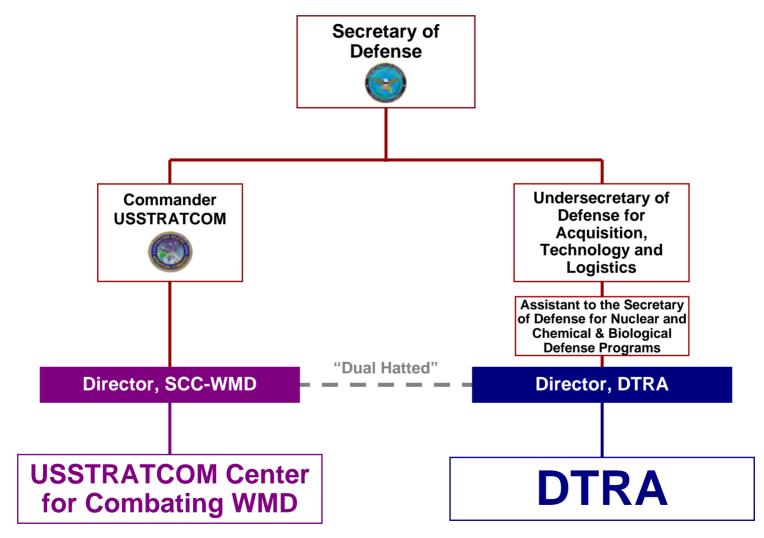
Joint Functional Component Commands





Command structure & relationships









Programmatic Response



Providing capabilities to the COCOMS



Nonproliferation



Counterproliferation



Foreign Assistance Activities

Technical Reachback Capabilities

Consequence Management



Training & Exercises



Programmatic initiatives



- Loose nuclear weapons
 - Locate, target and track
 - Render Safe
 - Attribution
- WMD elimination
 - CONOPS development underway
 - Army staff, TRADOC, 20th Support Command, USSTRATCOM
- Bio Initiative
 - FY 06-11 program issue and QDR initiative
 - Working with USAMRIID, JRO, JPEO, NCB, DTRA





The Future – Our People



Building the future workforce







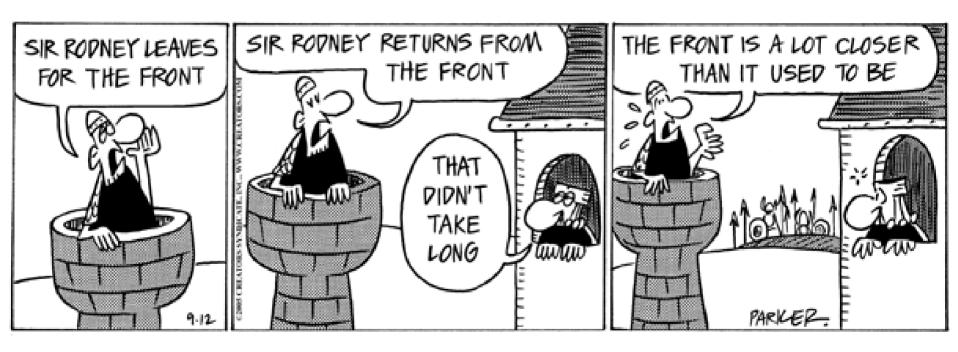


University Strategic Partnership

- Combating WMD is a multi-discipline, multigenerational challenge
- Must build next generation scientific/technical workforce while solving today's technical challenges.







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Back Ups



SCC-WMD chronology



- 06 Jan 05 SecDef Memo: "I assign CDRUSSTRATCOM as the lead combatant commander for integrating and synchronizing DoD in combating WMD."
- 02 Feb 05 CJCS Warning Order
- 26 Aug 05 SCC-WMD Establishment Memo
- 26 Aug 05 SCC-WMD Implementation Directive
- 26 Jan 06 SCC-WMD declared IOC
- 31 Jan 06 SecDef 'dual hats' DIR/DTRA
- 04 Apr 06 DDIR/SCC-WMD onboard
- 05 May 06 UCP-06 approved



SCC-WMD mission



The Center will integrate and synchronize DoD efforts to combat WMD in support of US government objectives. The Center will develop and maintain global situational awareness of WMD activities, advocate for combating WMD capabilities, and assist with WMD planning, while shifting emphasis from DoD-centric approaches toward interagency solutions.

SINGAPORE ARMED FORCES CHEMICAL BIOLOGICAL RADIOLOGICAL & EXPLOSIVES DEFENCE GROUP



COL <u>HO</u> KONG WAI COMMANDER, CBRE DG

27 June 2006



PRESENTATION SCOPE

- Video & Introduction
- Vision and Mission
- Structure & Organization
- CBRE Operations in Singapore
- Enhancing CBRE DG Capabilities
- CBRE Ops-Tech Integration



GROWING TERRORIST THREATS

- Gulf War prompted the SAF to begin Individual Chemical Defence Training in 1991
- Tokyo Subway SARIN Gas Attack and Oklahoma
 City Bombing reinforced the need
- SAF developed limited chemical response capability in 1996 for WTO Meeting in Singapore





SAF - CBRE CAPABILITY BUILD UP

- National level Inter-Ministry Working Committee (IMWC) conceived in 2000
- Sep 11 & Anthrax attacks : Developed National
 Ops Capability to address CBRE terrorist threats
- CBRE Defence Group was formed in Oct 2002





CHALLENGES

- Global city with a high population density
- Need to contain and minimize impact
- Enhance confidence in homeland security
- · Prevent its use as an instrument of fear
- Paradigm shift from conventional to Terrorist Threat orientation
- New challenges in Improvised Explosive Devices containing
 CBR Payloads
- CBRE Operations shifted from Open terrain to Enclosed places





OUR VISION

Be A World-Class Operationally Ready & Technologically Advanced CBRE Force

OUR MISSION

Provides Specialist CBRE Advice and Support throughout the Spectrum of Operations.

<u>K</u>ey <u>S</u>uccess <u>F</u>actors

REACH

Deploy high
readiness CBRE
expertise to
geographical
locations in
Singapore and
the region

RIGHT PEOPLE

Tapping the
expertise of the
right people at
the various levels

RICHNESS

CBRE

professional

knowledge, skills

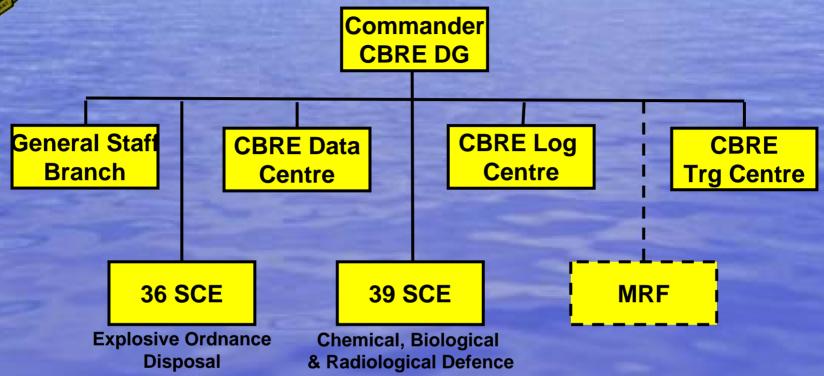
and application

of advanced

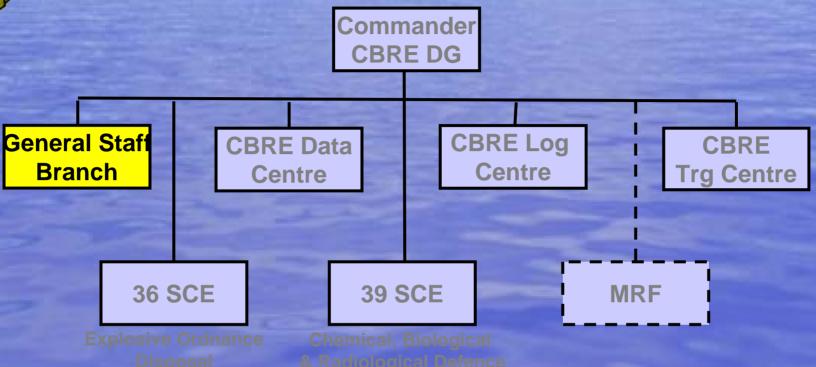
technology in

operations.





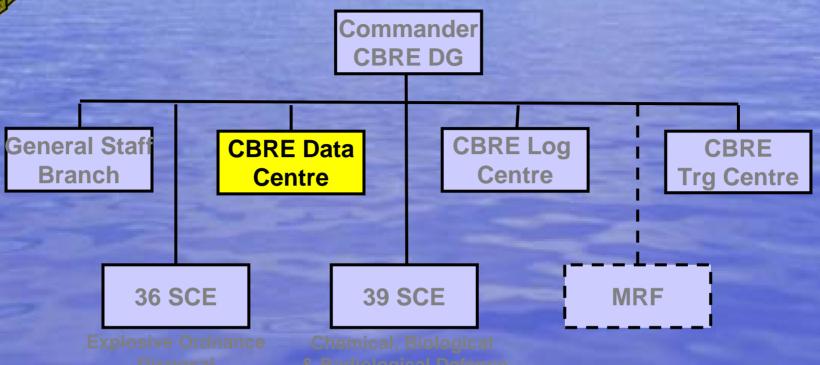




- Plan and manage CBRE operations in full spectrum of operations
- Develop CBRE doctrine and training
- Drive and manage CBRE Technology Acquisition
 / S70 Research & Development
- Manage MP ROA for all CBRE vocationalists



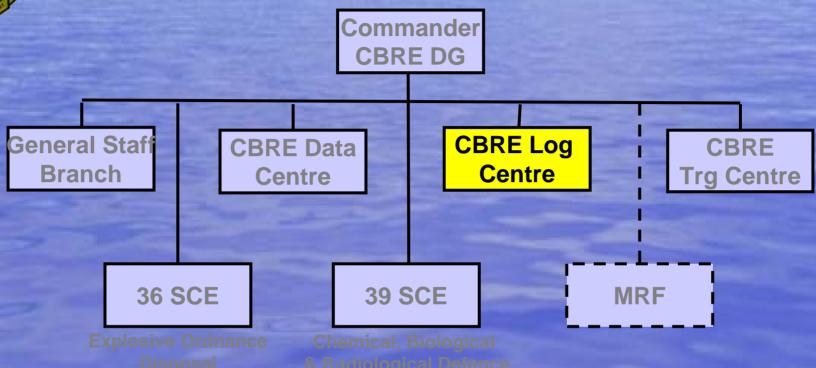




- Conduct intelligence and operational research for operational, doctrinal and capital development
- Provide both distant and on-scene CBRE intelligence support.
- Provide post CBRE incident investigation support



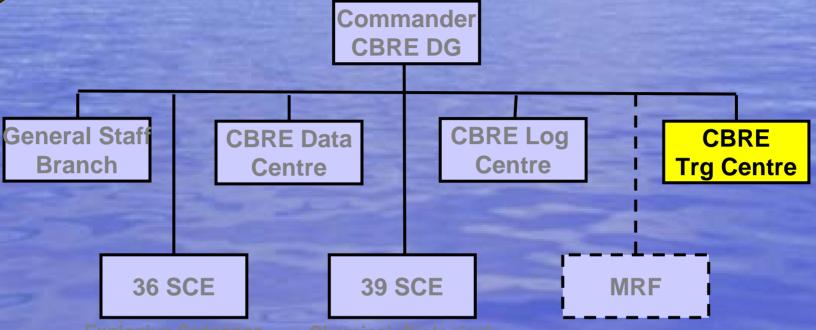




- Maintain high logistics readiness
- Oversee and manage the supply of centralised stores
- Provision of dedicated and unique maintenance for CBRE equipment
- Maintaining a 4-hr repair capability







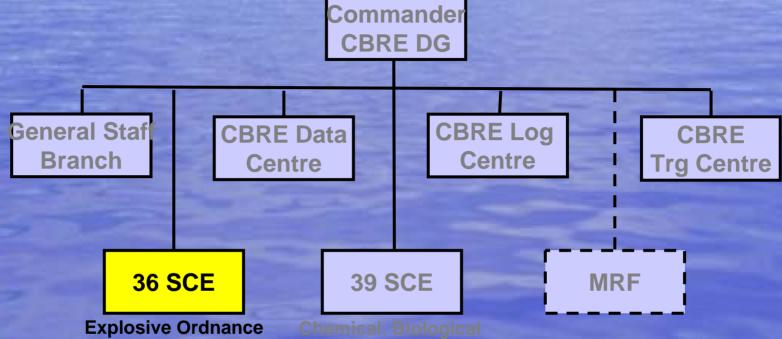
Explosive Ordnance

Chemical, Biological & Radiological Defence

- Develop CBRE course syllabus and training pack
- Conduct CBRE vocational courses for Commande
- Conduct of NS ICTs
- Evaluate Annual ETEPs
- Assist to conduct evaluation trials to enhance operand training needs







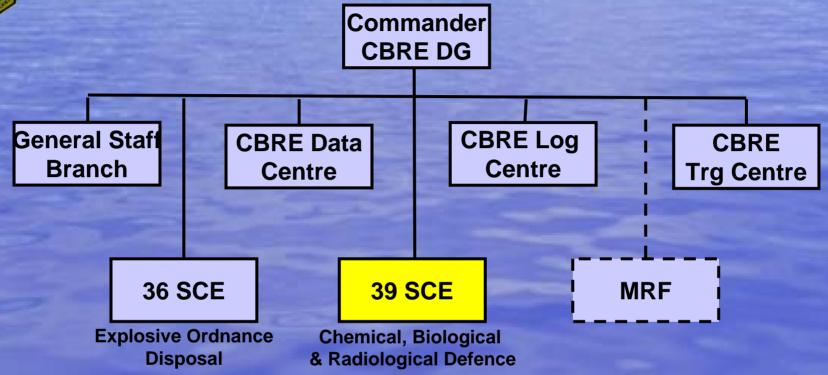
- Preventive Bomb Sweeps
- Conventional EOD Clearance
- IED Disposal Operations with CBR payloads

Disposal

Post Explosion Investigation



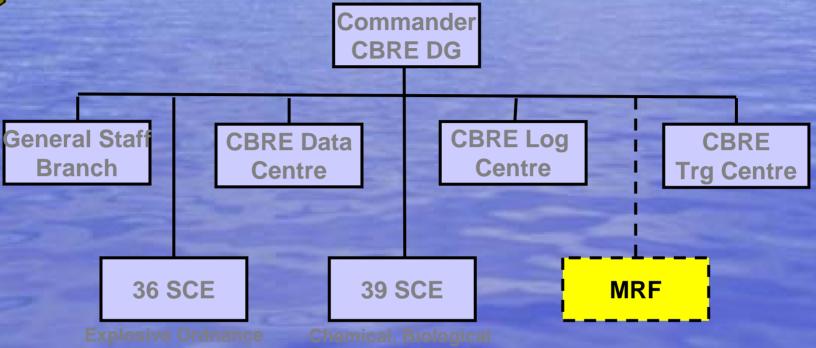




- Preventive CBR Sweeps
- Surveillance, Sampling, Detection
- & Identification of CBR Threats
- Decontamination Operations
- Post Incident Monitoring







- Provide on-site medical treatment for chem - bio casualties
- Evacuate casualties to hospitals





CBRE OPERATIONS IN SINGAPORE

- Maintain ops response at 15min NTM
- Maintain a Step-up system if earlier section has been activated for response
- Additional assets to be placed on standby at higher THREATCON levels
- Command and Control multiple CBRE incidents





CBRE OPERATIONS IN SINGAPORE

Recent events

- Letter Bomb at Myanmar Embassy (Oct 02)
- SARS MOH Ops Group (May 03)
- Ops FLYING EAGLE III (Jan 05)
- Chemical incident inside Changi Air Base (Apr 06)
- CBRE Search Ops onboard MV President Adams (May 06)











CBRE OPERATIONS IN SINGAPORE

Year 2005

World Economic Forum	28 - 29	9 Apr 05	5)
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 IISS Asia Securit 	v Summit - The S	hangri-la Dialogu	e (3 - 5 Jun 05)
		The state of the last of the l	

 International Olympic Committee (IOC) Session (2 - 9 Jul 05) 	•	International Ol	ympic C	ommittee (IOC)	Session	(2 - 9 Jul 05)
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 National Day Parade (N 	DP) Preview & NDP	(30 Jul & 9 Aug 05)

Year 2006

 Asian Aerospace 		(21 - 26 Feb 06)
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Singapore General Elections	(27 Apr - 6 May)

 IISS Asia Securi 	ty Summit - The Shang	gri-la Dialogue	(2 - 4 Jun 06)
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 NDP Preview 		(2	29 Jul 06)

• IMF - World Bank Conference (Singapore 2006) (12 - 20 Sep 06)



Enhancing CBRE DG Capabilities

- Minimize risk exposure, integrate
 COTS Robots with
 - CBRE Detection
 - Mitigation
- Early warning, evaluate COTS standoff detection and identification for CBRE threats
- Deal with 'Dirty Bombs'
 - Render-safe
 - Containment







Medical Bio-Defence

Physical Countermeasures



Chemical, Biological & Radiological Defence (CBRD)

Defence Medical & Environment Research Institute (DMERI)

DEFENCE SCIENCE ORGANISATION

- NATIONAL LABORATORIES



Medical Countermeasures - Chem



Detection & Verification

