NBC CONTAMINATION AVOIDANCE

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Advanced Planning Briefing to Industry

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Outline

- Overview
- S&T and Warfighter Needs
- Technical Challenges
- Acquisition Strategy/ Funding/ Schedule
- Upcoming Business Opportunities
- Contacts

S&T Overview

Joint Chemical Agent Detector (JCAD)

- **Overall Objective - Development of science and technology to detect, identify, quantify, map, and track the presence of chemical and biological warfare agents**
  - **Fundamental development of signatures**
  - **Understand the interactions of the signatures with the environment**
  - **Development of physics-based models enhanced with system engineering principles to provide a virtual system**
    - **War gaming to develop optimal system capabilities/needs/requirements**

Program Overview

Joint Chemical Agent Detector (JCAD)

- **Program will result in the acquisition of a portable monitoring and small point chemical agent detector for aircraft, shipboard and individual soldier applications.**
- **Currently, the JCAD –**
  - **Automatically detects, identifies, and quantifies chemical agents inside aircraft and shipboard interiors**
  - **Provides for hand-held monitoring capabilities**
  - **Alerts the individual soldier/sailor/airman/marine through the use of pocket-sized detection and alarm.**
- **The Increment 2 JCAD must be –**
  - **Sufficiently sensitive to warn aircrews before accumulation of a dose, over the entire mission, which will cause miosis or more severe effects**
  - **Resistant to the severe interferent environment on a naval vessel**
  - **Small and rugged for individual use.**

S&T Needs

- **Ability to handle low volatility materials**
- **Ability to handle all TICs**
- **Increase sensitivity and selectivity**
- **Faster response times at high sensitivity**

Warfighter Needs

- Miosis-level detection capability (Increment 2)
- Calculates accumulated dosage (Increment 2)
- Fully compatible with Joint Warning and Reporting System (JWARN) (Increment 2)
- Detects additional agents
- Smaller and lighter
- Less power
- Less costly

S&T Technical Challenges

Joint Chemical Agent Detector (JCAD)

Near Term

- Improvement of prototype IMS systems to response to low volatility materials

Far Term

- Sensitivity to achieve no effects detection level for warfare agents
- Expansion of detectable materials to include TICs
- Development and integration of MEMS or nano technology

Program Technical Challenges

Joint Chemical Agent Detector (JCAD)

- **Sensitivity vs. selectivity**
- **Operation in environmental conditions**
  - **-32°C to 49°C**
  - **0 to 100% RH**
- **Agent concentrations 100 times less than fielded systems**
- **TICs**
- **JWARN compatible**

S&T Capability Strategy

- **Hybridization of technology to address individual technology shortfalls**
- **Evaluate MEMS approaches to existing technology**
- **Understand critical parameters on nano-technology for application development**

Program Acquisition Strategy

- Market survey
- Procure system samples
- Government evaluation
- Production Qualification Tests to collect data against sub-miosis requirements
- Low Rate Initial Production
- Multi-Service Operational Test and Evaluation
- Full Rate Production decision
- Field

S&T Funding

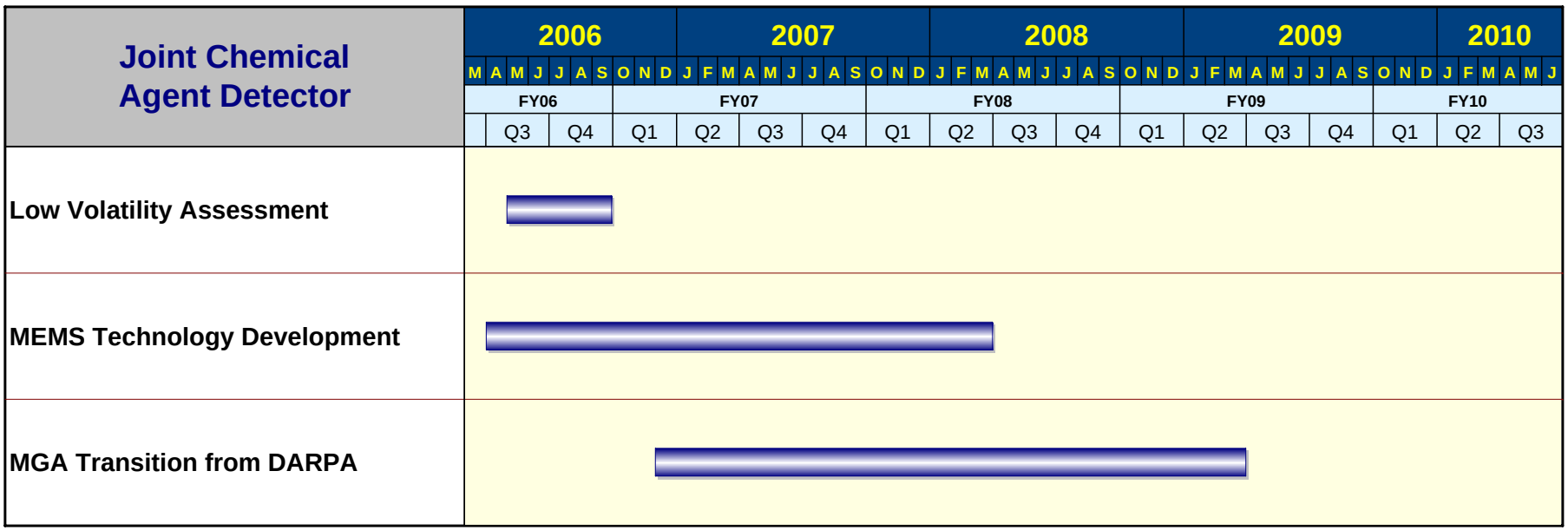
JCAD Program Funding ($M)								
BA	PY	FY06	FY07	FY08	FY09	FY10	FY11	TOTAL
6.2		1.5	1.5	1.5				4.5
6.3		0.5	1.0	6.5	10.5	8.0		26.5
TOTAL		2.0	2.5	8.0	10.5	8.0		31.0

Program Funding

JCAD Program Funding ($M)								
BA	PY	FY06	FY07	FY08	FY09	FY10	FY11	TOTAL
6.4	0	0	0	0	0	0	0	0
6.5	102.8	16.8	3.5	12.1	14.4	4.5	2.0	156.1
PROC	1.0	0	22.7	26.5	30.4	32.3	39.5	152.4
TOTAL	103.8	16.8	26.2	38.6	44.8	36.8	41.5	308.5

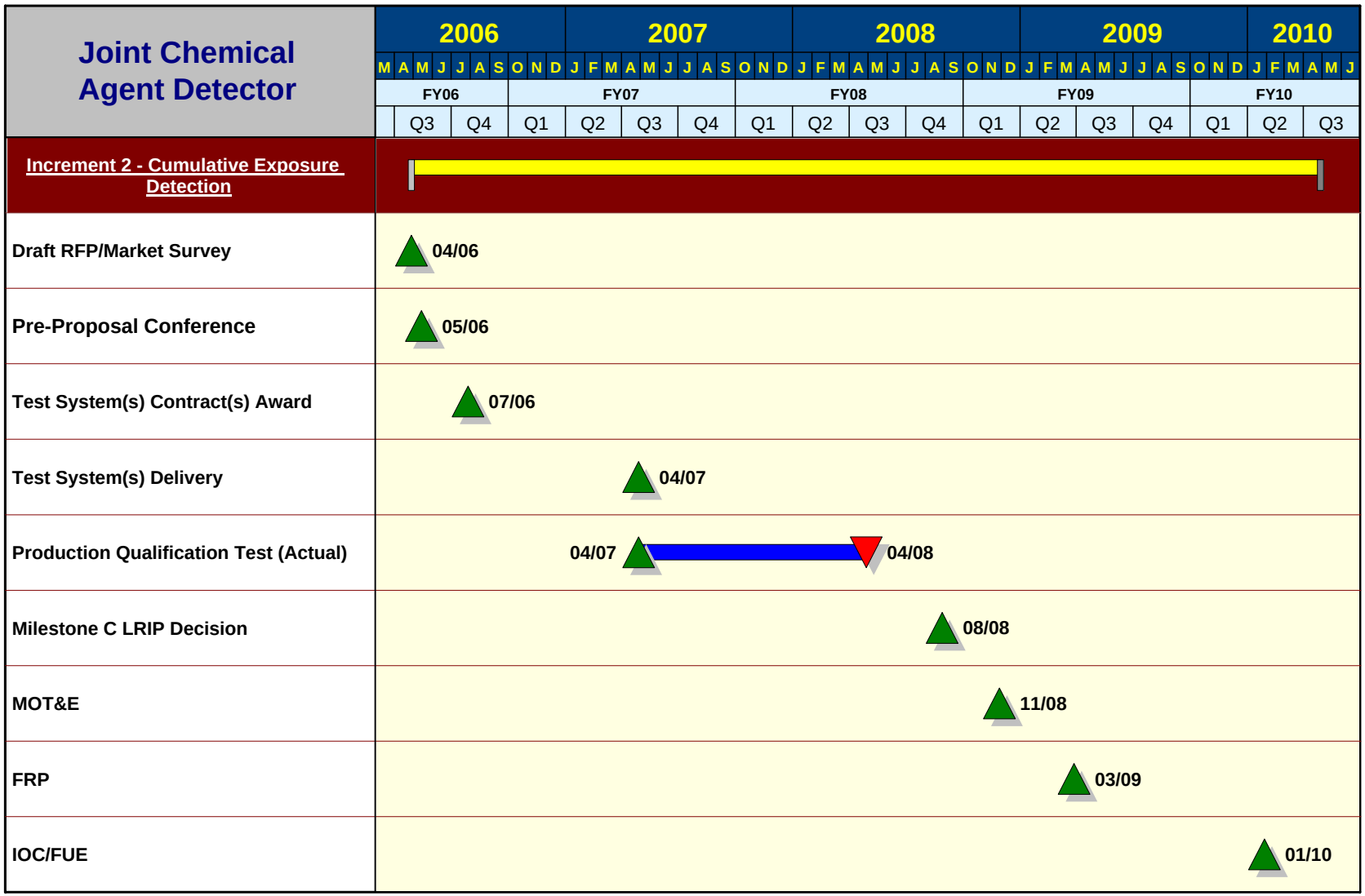
S&T Schedule

Joint Chemical Agent Detector (JCAD)



Program Schedule

Joint Chemical Agent Detector (JCAD)



S&T Upcoming Business Opportunities

Joint Chemical Agent Detector (JCAD)

- **FY06 Chem Bio Defense Initiative Fund** **3QFY06**
- **FY07 SBIR** **Oct 2006**
- **FY08 Chem Bio S&T BAA** **Dec 2006**
- **FY07 Chem Bio Defense Initiative Fund** **2QFY07**
- **FY08 SBIR** **Oct 2007**

Upcoming Business Opportunities

Joint Chemical Agent Detector (JCAD)

- **Market Survey/Draft RFP** **3QFY06**
- **Pre-Proposal Conference** **3QFY06**
- **Contract Award for Test Systems** **4QFY06**

Product Directorate Test Equipment, Strategy, and Support (PD TESS)

PD TESS

MISSION

The Product Directorate Test Equipment, Strategy, and Support Will Support the Milestone Decision Authority, Joint Project Managers, and the Test and Evaluation Community with the Development of Test Capabilities to Adequately Test and Evaluate, Chemical, Biological, Radiological, and Nuclear Defense Systems Throughout the Life Cycle Acquisition Process.

Background

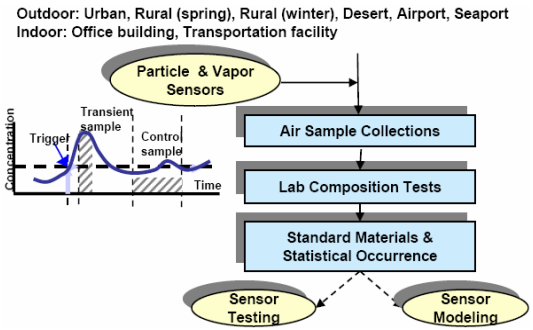
- T&E Needs
  - Dec 03-Mar 04 – Needs identified
  - Apr 04 – Presented to Annual T&E Review, Eglin AFB
  - Jun 04 – Briefed to DATSD(CBD)
  - Jul 04 – Aligned with JPEO/JSTO Programs
  - Aug 04 – Further scrubbed in EPP
- Dec 04 – EPP approved, resulting in plus up for T&E
- Feb 05 – PD TESS established
- Feb 05-Sep 05 – PD TESS developed T&E Strategy
- 07 Oct 05 – CB T&E investment strategy approved
- Oct-Dec – Test site visits and Acquisition Effort Analysis/Planning

Final Acquisition Approval Provided to JPEO 07 Feb 06

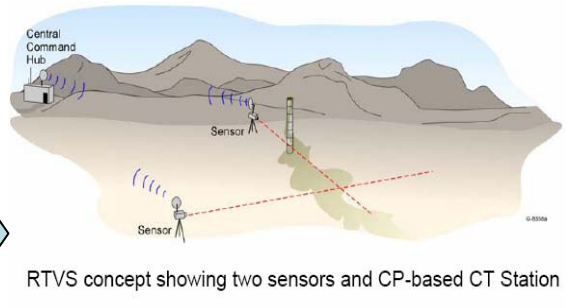
S&T for PD TESS

- **Overall Objective - Development of science and technology to detect, identify, quantify, map, and track the presence of chemical and biological warfare agents**
  - **Fundamental development of signatures**
  - **Understand the interactions of the signatures with the environment**
  - **Development of physics based models enhanced with system engineering principles to provide a virtual system**
    - **War gaming to develop optimal system capabilities/needs/requirements**
- **Mid Term**
  - **Complete feasibility studies on THz spectroscopy for bio signatures**
  - **Complete next generation near-real time referee system for mapping chemical clouds for field trials**

S&T as it Relates to PD TESS

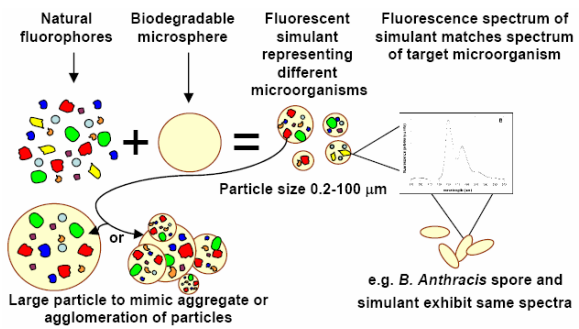


CA06DET425 - Measurement of Natural Interferent Transients

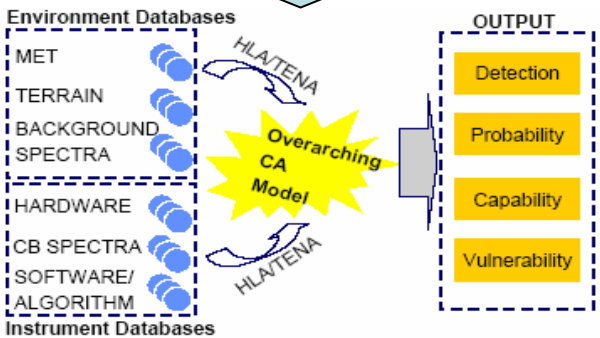


RTVS concept showing two sensors and CP-based CT Station

CA06DET410 – Range Test Validation System



CA06TAS416 - Simulating Fluorescence Characteristics Using Biodegradable Microspheres



CA06MSB414 – Contamination Avoidance (CA) Overarching Model

Test Range Capability

Missing 6.2 and 6.3 Funding

Development of simulants, test methods, and overarching models will transition to a test range capability that relates to relevant field conditions

Acquisition Approach

	Test Infrastructure Efforts	Acquisition Approach	FY06	FY07	FY08	FY09	FY10	FY11
1	LC/GC (6.3 Material Support)	Contract						
2	ColPro Airflow Mapping	OGA (Dahlgren)						
3	XYZ IPE Grid	OGA (DPG)						
4	Background/Interferents	Contract						
5	Standard Unit of Measure	Economy Act Action						
6	Spectroradiometer (6.3 Material Support)	Contract						
7	Stimulants/Stimulators	Contract						
8	Dynamic Test Chamber	Contract						
9	NTA Facility	Contract						
10	WSLAT Chamber	OGA (DPG), Contract (Design)						
11	Test Grid Instr Network & Design	OGA (DPG) (FY06), Contract						
12	Upgrade DPG Decon Facility	OGA (DPG)						
13	Bio Standoff Facility	NAS Study						
14	Upgrade DPG ASC/JABT	OGA (DPG)						
15	IPE MIST Chamber Upgrade	OGA (DPG)						
16	IPE Mannequin	Contract						
17	Upgrade ColPro Facilities	OGA						
18	CBART	OGA (DPG)						
19	DPG Chem Lab Upgrades	Contract						
20	Bio Spectral Instrument	Contract						

6.4 - $23M
6.5 - $229M

Business Opportunity

Background/Interferents

- **Effort Description:**
  - **Develop a library of real world environmental and interferent physical characteristics for CB detector programs. These signatures will be integrated into models to generate synthetic environments to assess detector performance under various conditions. Gap addressed: Improved ability to represent wider range of environmental conditions during testing.**
- **Schedule: FY06 – FY08**
- **Acquisition Approach: Contract**

Business Opportunity

Stimulants/Stimulators

- **Effort Description:**
  - **Design and build detection system stimulants and stimulators to facilitate hardware-in-the-loop in a field environment. Validate simulators and stimulators. Gap addressed: These T&E capabilities are critical to support operational testing of Shape and Sense systems in a wide range of environments.**
- **Schedule: FY06-FY08**
- **Acquisition Approach: Contract**

- **Simulant –** A chemical or biological compound with properties similar to a particular agent.
- **Stimulant –** A physical item or device used to produce an alarm condition in a detector.
- **Stimulator –** An electronic device or software construct used to produce an alarm condition in a detector.
- **Simulator –** An electronic device or software construct used in place of a detector. The simulator provides the same outputs as an actual detector.

Business Opportunity

Dynamic Test Chamber

- **Effort Description:**
  - **Design, fabricate, instrument, and validate a chemical agent point detector chamber at DPG to allow the chamber environment, including challenge materials, to be varied to simulate "real world" conditions for chemical point detectors. Develop standardized Test Operation Procedures. Gap addressed: This T&E capability is critical to address ever increasing sensitivity levels of detectors to operate in post-decontamination mode and a variety of dynamic challenge environments to establish sensitivity levels over a wide range of threats.**
- **Schedule: FY06-FY08**
- **Acquisition Approach: Contract**

Business Opportunity

NTA Facility

- **Effort Description:**
  - **Design and Build a NTA test chamber for detection, IPE, Decon, and COLPRO systems at ECBC for research and developmental testing. Test techniques, methodologies, dissemination hardware, and referee instrumentation will be developed and validated during this effort. Develop standardized Test Operation Procedures. Gap addressed: This T&E capability is critical to address requirements of all systems to provide performance with respect to NTAs.**
- **Schedule: FY06-FY08**
- **Acquisition Approach: Contract**

Business Opportunity

WSLAT Chamber

- **Effort Description:**
  - **Whole system biological point live agent test capability and chamber at DPG already in design. Test techniques, methodologies, dissemination hardware, and referee instrumentation will be developed and validated during this effort. Develop standardized Test Operation Procedures. Gap addressed: The WSLAT T&E capability is critical for current and future biological point detectors in order to establish the end-to-end point biological detection performance capabilities and limitations with live biological agents under realistic threat conditions.**
- **Schedule: FY06-FY09**
- **Acquisition Approach: OGA (DPG), Contract (Design)**

Business Opportunity

Test Grid Instr Network & Design

- **Effort Description:**
  - **Fully instrument the DPG CB simulant field test capability to include cloud tracking and other instrumentation, test support equipment, and safari capability. Test techniques, methodologies, dissemination hardware, and referee instrumentation will be developed and validated during this effort. Develop standardized Test Operation Procedures. Gap addressed: This T&E capability is required for CBDP efforts for verification of field performance in varied outdoor threat realistic environments.**
- **Schedule: FY06-FY11**
- **Acquisition Approach:**
  - **Immediate Requirement – OGA (DPG) (FY06)**
  - **Full Design and Acquisition – Contract (FY06 – FY11)**

Business Opportunity

IPE Mannequin

- **Effort Description:**
  - **Design and procure three sweating articulated robotic mannequins that simulate soldier activity for use in agent test facilities, including DPG and ECBC. Develop standardized Test Operation Procedures. Gap addressed: This T&E capability is critical to allow full system evaluation of protective ensembles with actual agents.**
- **Schedule: FY06-FY09**
- **Acquisition Approach: Contract**

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