



US Army Natick Soldier RD&E Center (NSRDEC)

National Protection Center (NPC)

The Science Behind the Soldier: Yesterday, Today and Tomorrow



UNCLASSIFIED

A DoD focal point for the advancement of individual and integrated personal protection. Leveraging Military Technology with applications for public safety, Homeland Defense and Homeland Security.



***Personal
Protection***

***Multifunctional
Integrated
Systems***



Unique partnerships: DoD, Department of Homeland Security, National Institute of Standards and Technology, National Institute of Justice (NIJ), OGA, industry and academia

Technical Expertise
for
Military & Civilian
Emergency Responders

National Focal Point

- Establish RDT&E teams to address PPE for Homeland Security Operations
- Promote technology integration, interoperability, dual-use standards
- Support national high-priority homeland security PPE initiatives for military and civilians or in other high-risk activities
- Support tech transfer related technology policies and procedures
- Assess projects of high dual-user relevance
- Identify shared/leveraged technology and knowledge investm

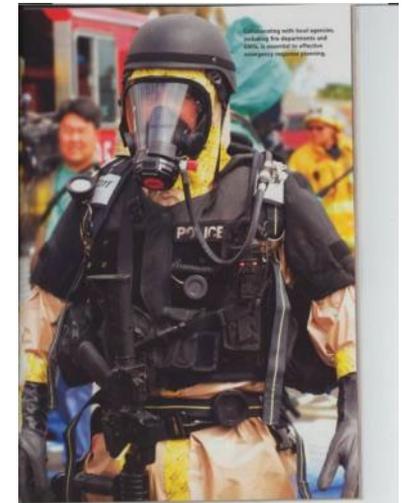


Partners

- Department of Homeland Security
- National Institute of Justice
- Other Government Organizations: Federal, State, Local
- Industry and Academia

On-going and Recent efforts:

- Law Enforcement CB Protective Ensembles
- Explosive Ordnance Device (EOD) Protection
- Microclimate Cooling Systems/Test Method validation
- Integrated Head Protection
- LE Duty Uniforms
- Advanced Personal Protection System
- SAVER Boot Evaluation
- Explosive Countermeasures
- Position Location and Tracking
- Personal Water Filtration
- CWA Simulants
- Micro Gas Analyzer
- TCIP Conference





- **Description:**
 - Address LE PPE needs by applying a System-of-Systems (SoS) / Human Systems Integration (HSI) approach
 - Focal point for integration of DHS, DoJ/NIJ S&T, RDT&E activities to address HLD/S needs
- **Activities**
 - Analysis and development of performance standards
 - Define performance requirements of integrated protective ensembles for LE practitioners (Federal, State, Local, and Tribal)
 - Develop proposed criteria for LE PPE standards development (Duty Uniform, MCC, EOD, CB)
 - Collect test data to support the advancement of LE PPE standards
 - Perform RDT&E to meet PPE needs of the HLS community

- **Objective:**

- Develop performance criteria
- Assess existing standards and test methods
- Examine the need for multi-hazard protection
 - » e.g. Flame, blood borne pathogens, cut/slash resistance, and durability to weather exposure



- **Deliverables:**

- Technical evaluation of DU materials
- User requirements assessment (HLS)
- DU Standards Gaps Analysis
- Final report (Draft Performance Standards Recommendations)



- **Objective:**

- Define law enforcement needs for MCC
- Investigate historical cases of heat injury
- Evaluate frequently purchased commercial MCC systems for use in law enforcement
- Conduct test methods assessment



- **Deliverables:**

- Literature review
 - MCC needs
 - Heat injuries
- Gaps Analysis Report
- MCC draft standard



- **Objective:**
 - Establish an NIJ Standard for Explosive Ordnance Disposal, Personal Protective Equipment (EOD PPE) containing minimum acceptable performance requirements and test methods
 - Establish guidance for purchasing bomb suits
- **Deliverables:**
 - Benchmark state-of-the-art Bomb Suits
 - Ergonomics testing and user requirements
 - Identification, characterization, and modeling identified threats
 - Establish performance requirements and test methods
 - Provide recommendations for SCAM document
- **Status:**
 - NIJ Special Technical Committee preparing the standard



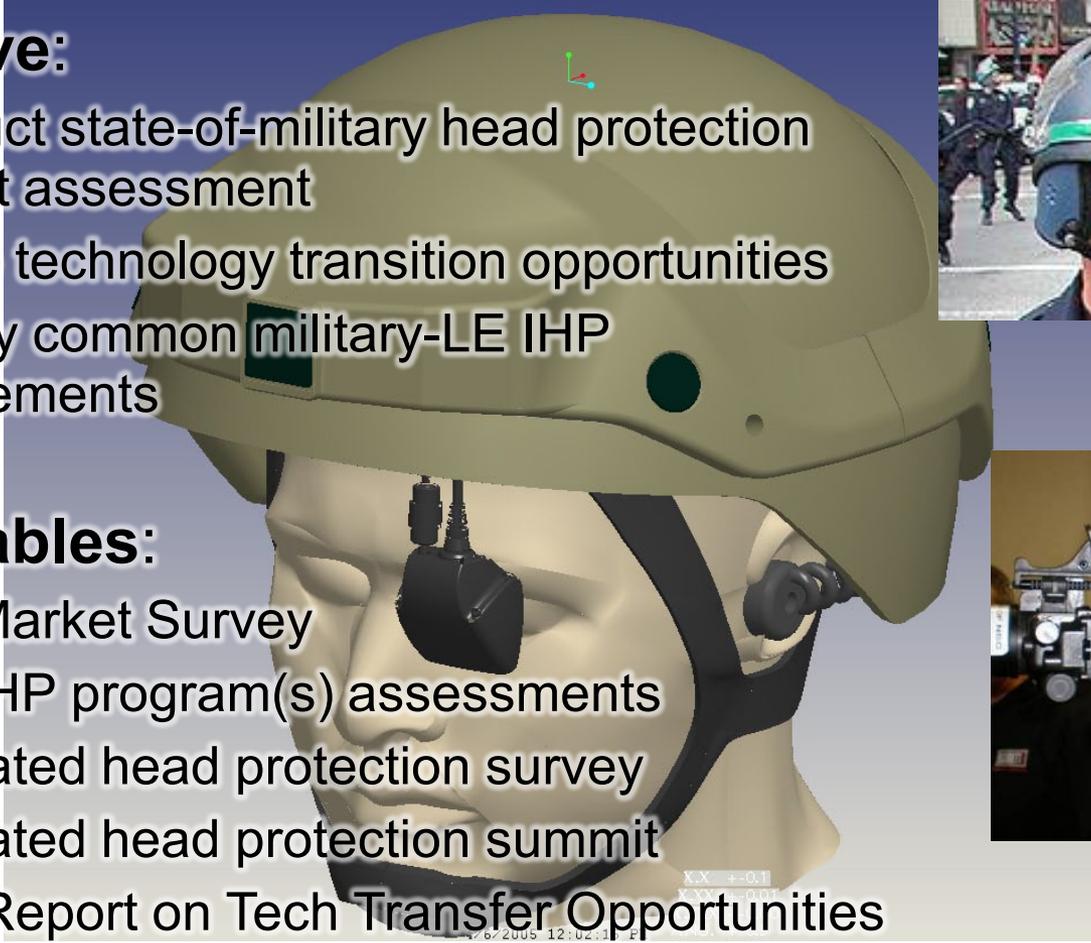
- **Objective:**

- Conduct state-of-military head protection market assessment
- Define technology transition opportunities
- Identify common military-LE IHP requirements



- **Deliverables:**

- DoD Market Survey
- DoD IHP program(s) assessments
- Integrated head protection survey
- Integrated head protection summit
- Final Report on Tech Transfer Opportunities



- **Objective**
 - Improve USCG / Law Enforcement user survivability.
 - Enhance system component interoperability.
 - Maximize user operational effectiveness.
- **Deliverables**
 - Improved/integrated personal protection system.
 - Vetted process for developing and validating personal protection components that can be transitioned to other DHS, law enforcement or first responder users.

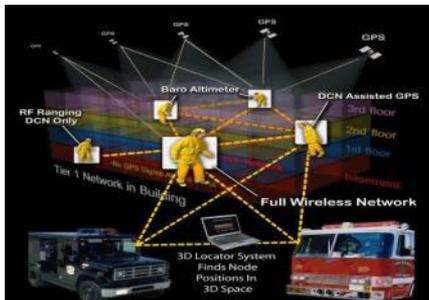


Objectives:

- Assess technology readiness of indoor location & tracking technologies
- Identify and quantify capability gaps for emergency responders

Operational Evaluation:

- Multiple Building Types
- Emergency responder focused scenarios
- Practitioner vetted evaluation plan



Deliverables:

- Determine the direction of future research
- Demonstration and field assessment of 5 tracking systems was conducted and preliminary results presented



- **Objective:**
 - Develop a method to produce potable water in the event a disaster contaminates local water supplies
 - Phase 1 - Identify and validate a commercial off-the-shelf solution to satisfy the requirement.
 - Phase 2 - If no COTS solution exists, develop a solution using commercial off the shelf technologies.
- **Deliverables:**
 - Program successfully completed.
 - COTS device identified
 - 100 gal production/4-week period
 - Family of 4, 1gal/person/day
 - Shelf life ~10 years
 - Objective cost: less than \$50 (\$48)
 - Recommendations and documentation provided to NYC OEM.



Objectives:

Determine the operational suitability and effectiveness of various commercial boots being considered for procurement by law enforcement.



Evaluate five brands of commercial law enforcement boots for:

- Capability
- Usability
- Maintainability

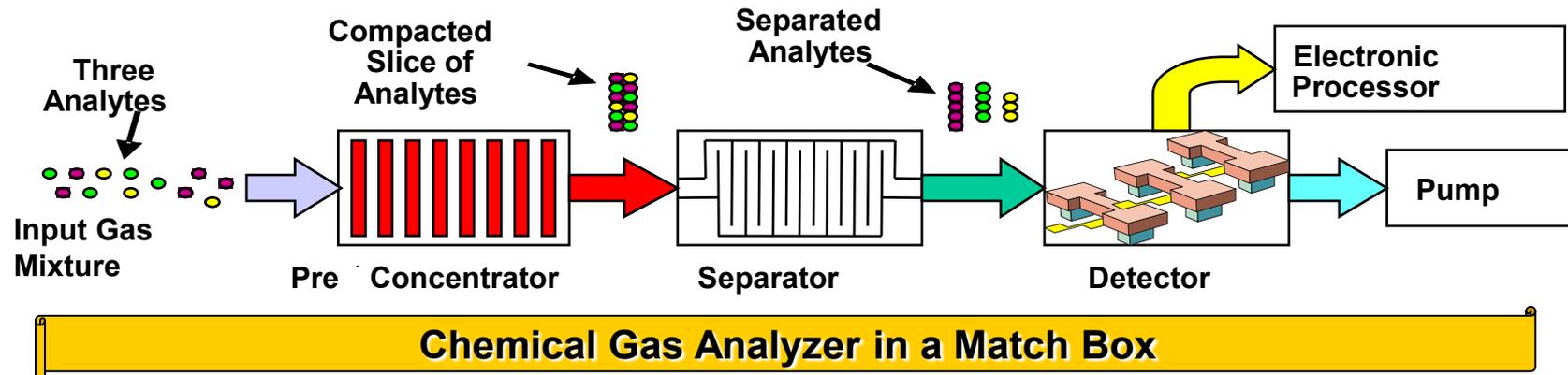


Deliverables/Major Accomplishments

- Boots distributed to 251 users
- Testing completed
- Survey conducted
- Final report submitted



Concept:



Prototype:

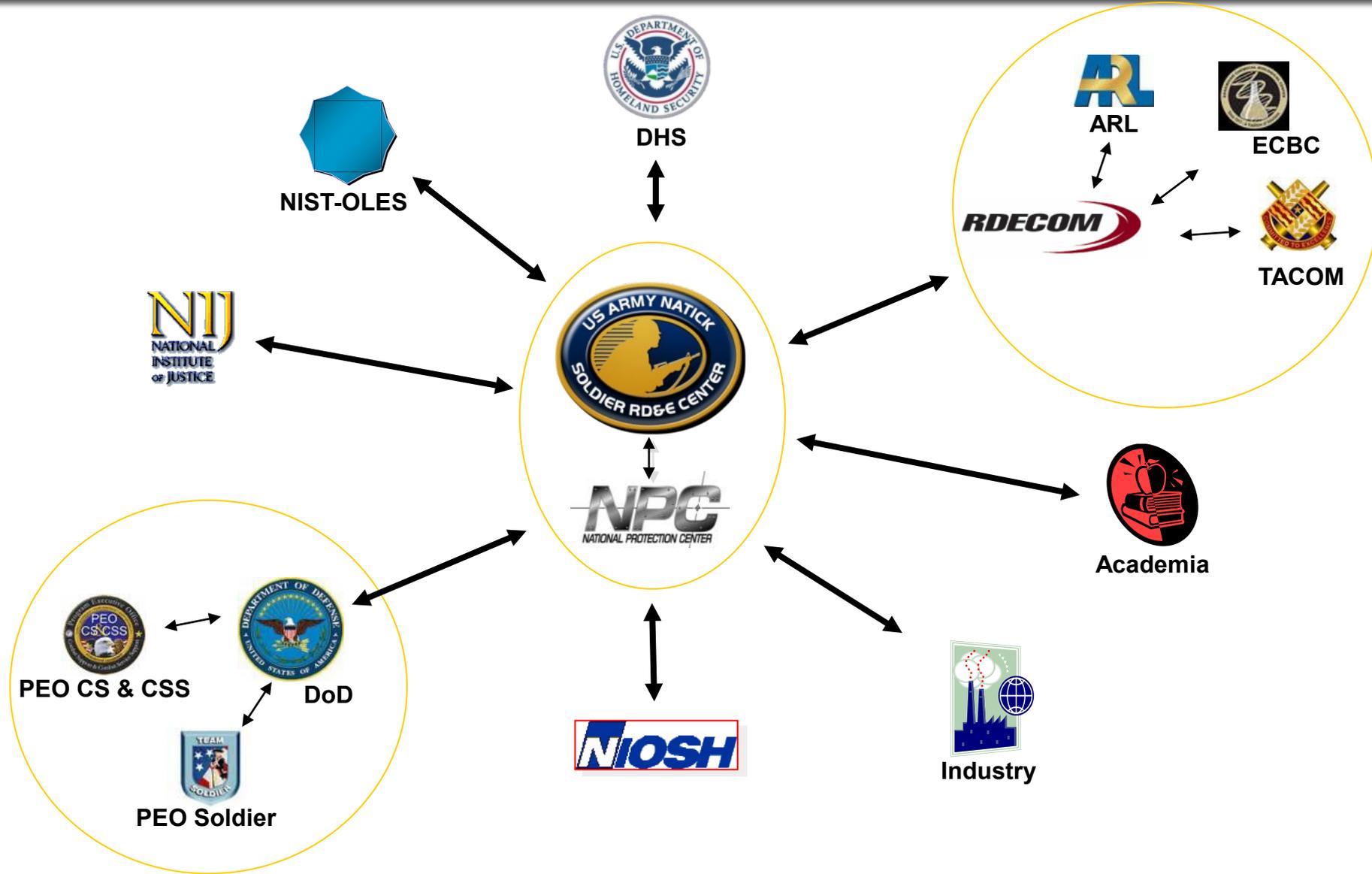


Goal:

Enable remote detection of chemical agents via tiny, ultra-low power, fast, chip-scale gas analyzers that greatly reduce the incidence of false positives

- 4 s separation time for 30 compounds
- Analytical capacity of 1,200
- Energy/analysis <0.5 J (1 J for GC-MS)
- Size <2 cm³
- False alarm rate less than 1 in 10⁷
- Sensitivity <1 ppt

Law Enforcement Advanced Protection Stakeholders



- **NSRDEC Homepage:**

nsrdec.natick.army.mil/about/techprog/index.htm

- **TSPID Homepage:**

nsrdec.natick.army.mil/about/techprog/index.htm

- **NPC Homepage:**

nsrdec.natick.army.mil/npc/index.htm



**Doing Great Things for the
Soldier Everyday
...50 Years and Counting**