



RDECOM



NATICK SOLDIER RESEARCH, DEVELOPMENT AND ENGINEERING CENTER



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

NSRDEC Pocket Guide

“As a Soldier and coming to Natick as a Combat Arms Noncommissioned Officer, you never know what to expect on a day to day basis. The Natick Soldier RD&E Center is an important step to ensuring that the equipment that leaves out of this facility, tested and proven, will help the Soldier in one way or another. There is no experience greater in a Soldier’s career than to be a part of the Natick team and help improve something that is already great.....The Soldier.”

SFC Peter K. Niemeyer
Operational Forces Interface Group
Natick Soldier RD&E Center

“It has been nice to see what really goes into the development and testing of all the equipment that I have used out in the field. I didn’t realize all the effort that the Natick workforce puts into each piece of equipment for the Soldier. It’s a comforting feeling.”

SFC Benjamin J. Lewis
Operational Forces Interface Group
Natick Soldier RD&E Center



Our Mission:

RD&E to maximize the Warfighter's Survivability, Sustainability, Mobility, Combat Effectiveness and Field Quality of Life by treating the Warfighter as a System



Our Vision:

To be the recognized center and partner of choice for Warfighter and Homeland Defender Related Research, Technologies and Systems



**Transformation to
the Future Force with the Warfighter
as the Centerpiece of
the Formation**



From S&T to Sustainment

Sciences & Technologies:

- **Military Nutrition**
- **Warrior Systems Tech & Integration**
- **Environmental Physiology**
- **Warrior Performance**
- **Biomechanics**
- **Food Science**
- **Anthropometry**
- **Nanotechnologies**
- **Biotechnology**
- **Individual and Small Unit Modeling & Simulation**
- **Precision Airdrop Technologies**

Programs & Warfighter Capabilities:

- **Combat Rations**
- **Chemical Protective Clothing**
- **Warrior Systems**
- **Aerial Delivery**
- **Clothing & Individual Equipment**
- **Field Feeding**
- **Firefighting & Flame Resistant Clothing**
- **Shelter Systems/Collective Protection**
- **Field Services**
- **Anti-Exposure Suits**
- **Shipboard Protective Equipment**
- **Homeland Security**
- **Ballistic Protection**

Supporting the Warfighter and the Joint Force



ARMY



MARINES



NAVY



AIR FORCE



SOF



COAST GUARD

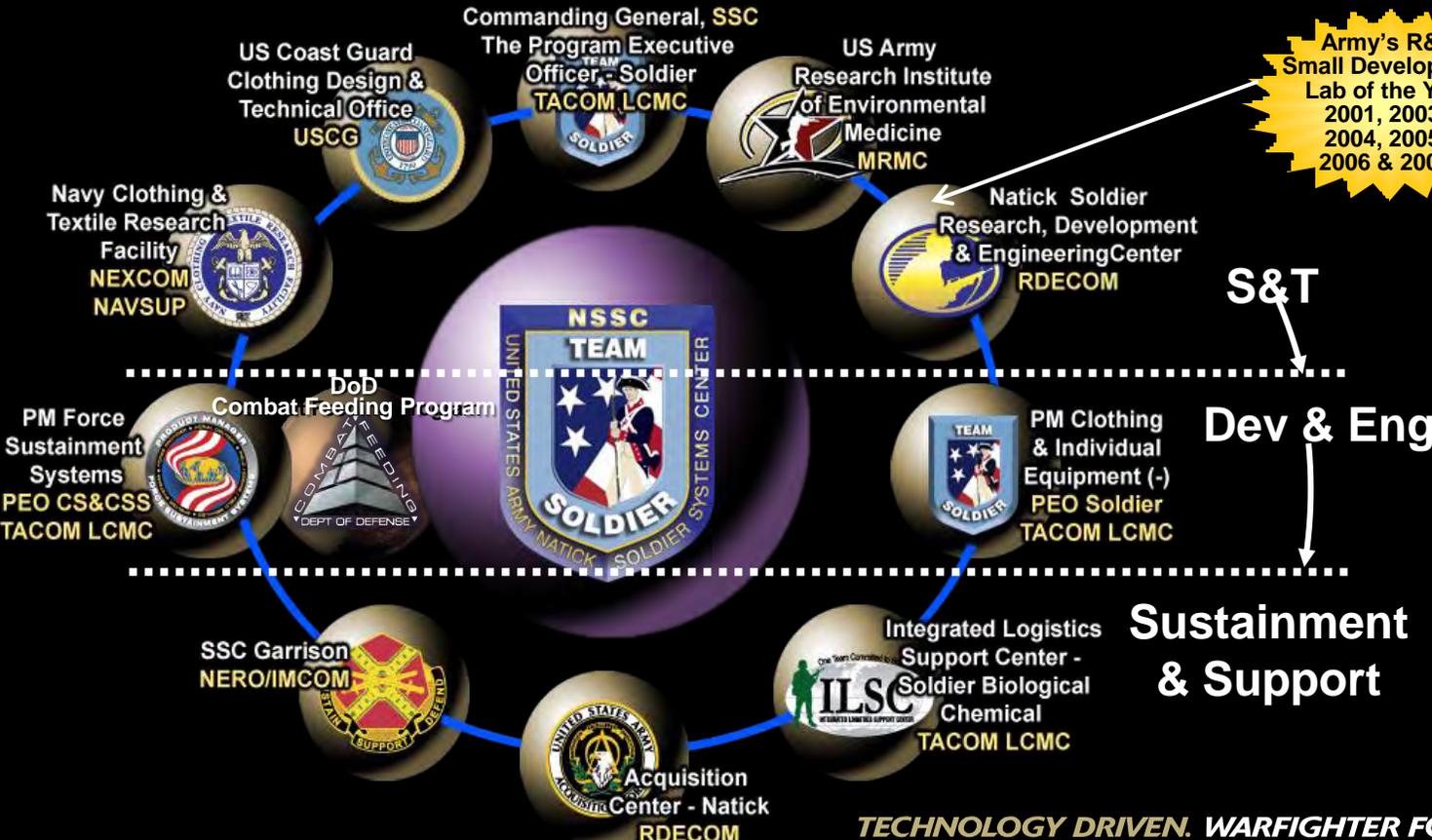
Defense

- Joint Program Executive Office (JPEO) for Chemical/Biological Defense
- Defense Logistics Agency (DLA)
- Defense Advanced Research Projects Agency (DARPA)
- Program Executive Office (PEO) Soldier
- Program Executive Office (PEO) Combat Support and Combat Service Support (CS/CSS)

Other Government Agencies

- Office of the Surgeon General
- National Aeronautics & Space Administration
- Food and Drug Administration
- United States Department of Agriculture
- United States Forestry Service
- Bureau of Engraving and Printing
- United States Postal Service
- Army Veterans Program
- Department of Justice
- Department of Homeland Security

We Are Part of Natick Soldier Systems Center



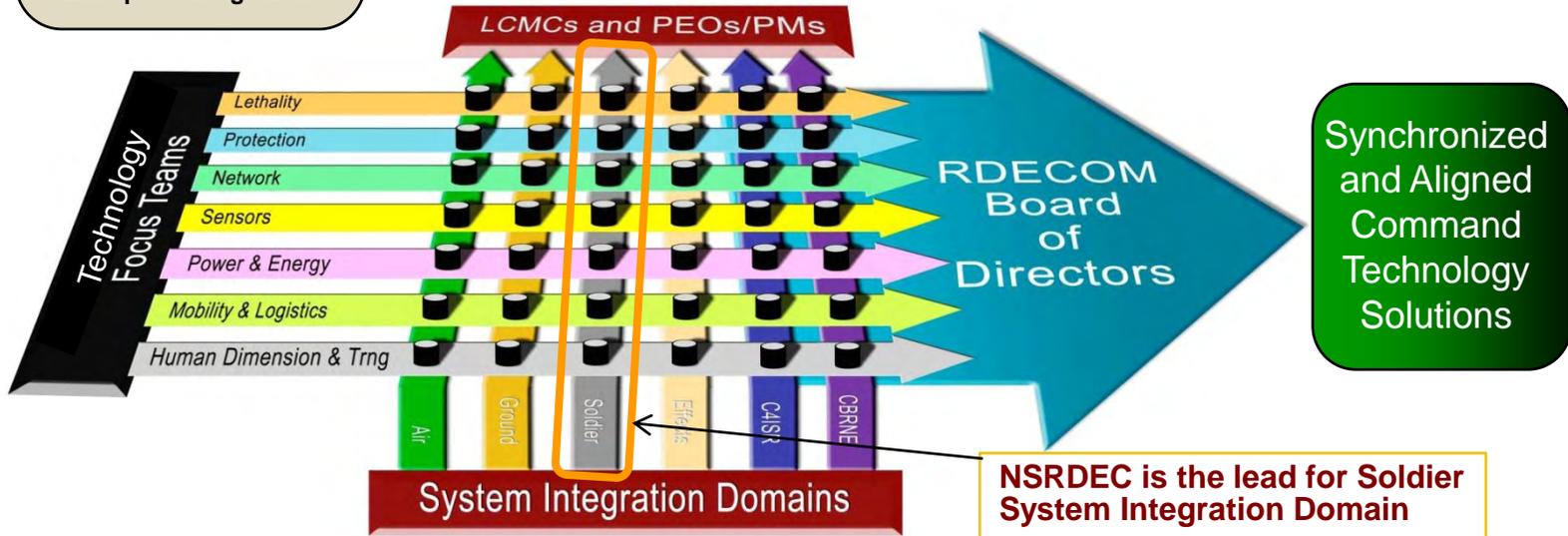
Army's R&D Small Development Lab of the Year 2001, 2003, 2004, 2005, 2006 & 2008!

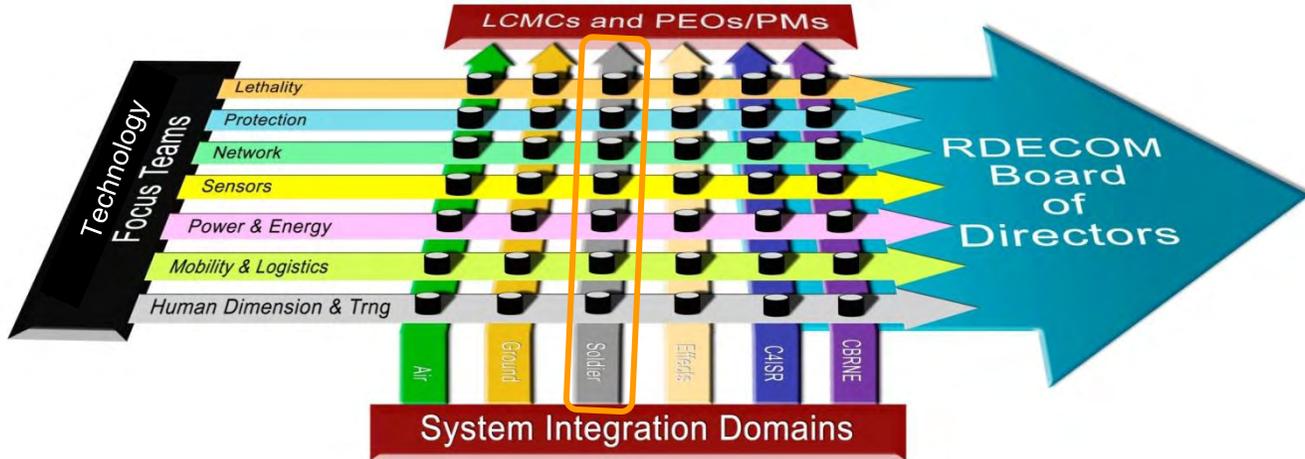
KNOWLEDGE CENTERS

- Nanotechnology
- Biotechnology
- Cognitive & Neuroergonomics
- Electronics
- Advanced Computing
- Enterprise Integration

SYSTEM OF SYSTEMS OVERLAY

- Systems Engineering Across Domains
- Cost & Performance Effectiveness Analysis (Army Materiel Systems Analysis Agency and Army Research Lab's Survivability/Lethality Directorate)
- Capability Gaps
- Program Synchronization





- Maximize RDECOM's research, development and engineering knowledge and capabilities
- Synchronize systems of systems thinking and solutions in support of key platforms
- Technology integration across all domains
- Development of more robust investment plans that maximize return on investment across platforms
- Better linkage and management of entire investment portfolio to include core and non-core projects
- Enhanced visibility to RDECOM leadership on investments and trends

**Achieving these objectives requires close collaboration & integration of efforts between
Technology Focus Teams and Domains**

Integrity, Warfighter & Customer Focus, Excellence, Teamwork



Think **TWICE** Before You Act



- **TEAMWORK:** Am I including everyone that needs to be involved & doing everything I can to help the team succeed?
- **WARFIGHTER FOCUS:** Am I making a positive difference in Warfighters' lives?
- **INTEGRITY:** Am I doing the right thing legally, morally and ethically?
- **CUSTOMER FOCUS:** Am I challenging myself to exceed the customer's expectations?
- **EXCELLENCE:** Am I producing the highest quality work I can achieve?







NSRDEC Strategic Goals



- **“World Class” Science & Technology**
- **Timely Transition of High Impact Technologies**
- **Recognized Leader in Defense Development and Engineering**
- **Strong Internal & External Partnerships**
- **High Quality, Relevant Facilities and Capabilities**
- **Balanced Investment Portfolio**
- **Highly Skilled, Motivated Workforce that Exemplifies our Core Values**
- **Effective, Efficient, & Adaptable Processes**
- **Government and Public Understanding of our Value**



- The NSRDEC ensures that the U.S. Warfighters are the best equipped, best clothed, best fed, and best protected in the world
- Through science and technology, we focus on airdrop, combat feeding, individual clothing and equipment, shelters, and Soldier system integration
- NSRDEC is tied into America's Homeland Defense efforts through its National Protection Center



The NSRDEC has received the Department of the Army's R&D Small Development Lab of the Year Award for six of the last eight years





Provides engineering and technical support to the Product/Project Managers across the Services in the areas of protective clothing and individual Warfighter equipment and systems. Plans and executes analyses and programs, and rapidly transitions products in partnership with Army, Marine Corps, Air Force and SOCOM PMs. Provides technical expertise in critical Warfighter protection areas including ballistic, chemical biological and environmental protection; multi-functional textiles and flame resistant materials; individual combat equipment; and human systems integration.



- Body Armor
- Combat Clothing
- Microclimate Conditioning
- Chemical Protective Gear
- Load Carriage
- Handwear/Footwear/Eyewear
- Environmental Clothing

S&T Thrust Areas:

- Chemical/Biological Barrier Materials
- Ballistic Protective Materials
- Directed Energy (Eye) Protection
- Environmental Protection
- Camouflage
- Multifunctional Materials



Executes the unique combat feeding requirements for each military service. This includes research, development, integration, evaluation and engineering for combat rations, field food service equipment and combat feeding systems. This Joint Service Program includes a partnership with Product Manager Force Sustainment Systems (PM FSS) for Army managed field food service equipment and systems.



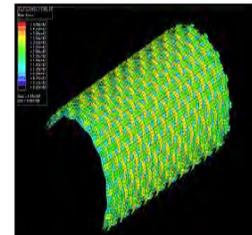
- Combat Rations
- Field Food Service Equipment
- Combat Feeding Systems

S&T Thrusts Areas:

- Energy & Equipment
- Food Safety/Biosensors
- Novel Preservation & Stabilization
- Novel Nutrient Delivery
- Revolutionary Packaging
- M&S/Logistics



Provides shelter systems for Soldiers in all types of environments. Provides unique shelter systems that will satisfy an abundance of purposes. This program develops unique concepts and technologies through technical management and engineering support for the Army and the Department of Defense (DoD), as well as industry, academia and foreign governments.



- Softwall Shelters
- Rigidwall Shelters
- Collective Chem/Bio Defense

S&T Thrust Areas:

- Barrier Materials
- Structures
- Energy Management
- Anchorage
- Finite Element Analysis
- Ballistics





Conducts research and engineering in military parachuting and airdrop systems to: increase aircraft/airborne force survivability; improve airdrop accuracy and functional reliability; reduce personnel injuries/casualties; and lower the cost to develop, produce and maintain these complex systems.



- Personnel Parachuting Systems
- Cargo Airdrop Systems

S&T Thrust Areas:

- Precision Airdrop (sensors, guidance & control systems)
- Integrated Logistics Aerial Resupply
- Modeling and Simulation
- Parachutist Safety
- Test Instrumentation
- Materials Research



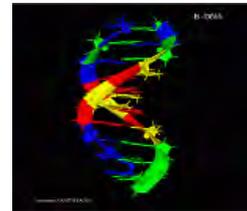
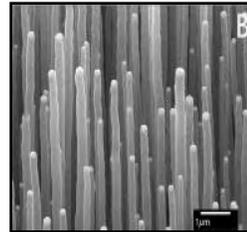


Conducts basic and applied research in the anthropological, behavioral, biological, environmental, operations research, mathematical and physical sciences. The program identifies opportunities supporting all command products and systems dedicated to improving the survivability, sustainability, mobility, and support of Warfighters on the battlefield.



S&T Thrusts:

- Anthropometry
- Biomechanics
- Material Science
- Sensory & Consumer Research
- Soldier Performance/Cognition
- Human Factors/MANPRINT
- Nanotechnology
- Biotechnology
- Polymer Science & Engineering
- Modeling & Analysis



Serves as the primary NSRDEC technology integrator and assessor to advance and transition modular and reconfigurable Soldier systems and technologies that will benefit and serve the next generation Warfighter's operational capabilities. Ensures that the NSRDEC Science & Technology Program addresses the Soldiers' needs, and supports the Army's S&T vision, strategy, and Transformation Objectives. Additionally, we apply our expertise to manage the technology development, integration and experimentation of the USSOCOM Small Unmanned Aerial Vehicle (SUAV) ACTD. Serves as a focal point for information exchange regarding protective clothing and individual equipment materials, systems and testing among homeland security emergency response professionals, military personnel and civilians in high-risk occupations.



S&T Thrusts:

- Soldier Systems Integration
- Soldier Integrated Protection
- Soldier Network, Power and Lethality Integration
- Soldier Mobility and Mission Enhancement
- Modeling and Analysis
- National Protection Center
- ACTD & Urban Terrain



National Protection Center (NPC)

The NPC is an interagency Project Manager of choice, with multi-agency Science and Technology resources applied to multi-threat/hazard protective technologies/capabilities that must be interoperable and compatible with multiple land and maritime based platforms in a wide number of missions under varying and uncertain conditions.

We achieve our goals through a central source of interagency collaboration drawing broad expertise in personal protection, operations/field support systems and technology transfer.

Unique partnerships: DoD, the Department of Homeland Security, the National Institute of Standards and Technology, National Institute of Justice (NIJ), the National Aeronautics & Space Administration, Other Government Agencies (OGA), industry and academia



Doriot Climatic Chambers

A unique national asset-designed specifically to test the limits of human performance under extreme conditions

- Critical to DoD's ability to design equipment and develop medical doctrine that optimizes Warfighter performance at environmental extremes experienced by Warfighters
- Primarily used to answer Warfighter focused questions using Soldier volunteers

Capabilities:

Simulates an extreme range of global weather conditions within two wind tunnels for human and equipment testing

Temperature: Arctic: -70° to 120° F

Tropic: 0 to 165° F

Relative Humidity: 10% to 90%

Wind Speed: 0 to 40 miles per hour

Rainfall: Up to 4" per hour

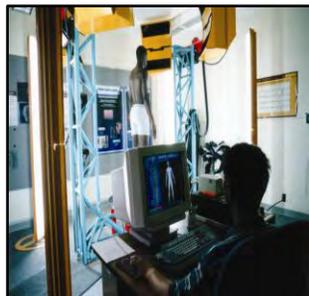


3D Laser Scanning Laboratory

- State-of-the-art whole body and head/face laser scanning systems
- Provides information about body shape critical for design and evaluation of clothing/equipment systems
- Enables measurement of body surface area and area of coverage for current and next generation armor and helmet systems

Academia/Industry Links:

- Support to creation of anthropometrically accurate human avatars for biomechanical models; Virtual Soldier Research, University of Iowa
- Head and helmet models for helmet-mounted sensors; MIT Aeronautics and Astronautics Department

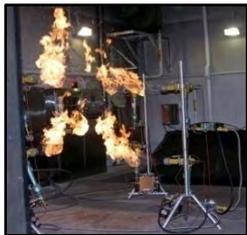


Thermal Test Facility

- Propane Fire Cell – testing of clothing systems, tents, and kitchen burners
- Flame and Thermal Lab – bench scale test equipment to test and evaluate novel polymers through finished textile materials
- Laser Lab – test and evaluate materials for laser eye protection

Academia/Industry Links:

- Establishing Joint-Service Flame & Thermal Working Group
- Working with UMass Center for Research on Polymers to establish a regional fire resistant (FR) Materials Research Collaborative





Soldier System Integration Lab (SSIL)

- Facilitates visualization, integration, and verification of new technology concepts and allows regression testing before field evaluation by Soldiers
- Open architecture lab environment, coupled with a robust data collection infrastructure, interface, and Soldier equipment
- Demonstration of Soldier subsystem modules featuring pretested architectures and analysis of test data to assess subsystem usefulness to Soldiers



Warfighter Payoff:

- Improved survivability and sustainability of the Soldier in the field
- Reduced risk in field due to thorough laboratory, systems and interoperability testing



Cognitive Performance Laboratory

Virtual Reality (Computer Automatic Virtual Environment (CAVE)):

- Full view (two 12 ft W x 9 ft H) projection displays
- Displays any environment (MOUT, mountains, desert), full surround sound
- User interface via wide area motion tracking with weapon simulation
- Locomotion interface via self-propelled treadmill synched with VR system

Mobile Cognitive Assessment Platform (MoCAP):

- Head-mounted display, headset/mic, wrist keyboard, instrumented M4, GPS tracking in outdoor environments, ruggedized PDA, laptop computer carried in custom harness
- Subject-worn laptop and PDA synched w/ experimenter base station via wireless peer-to-peer and Voice-over-Internet protocol (VoIP)
- Physiological monitoring, gait analysis
- Custom software for experimental design and data acquisition

Eye Tracker:

- Real-time tracker, can be used indoors or outdoors

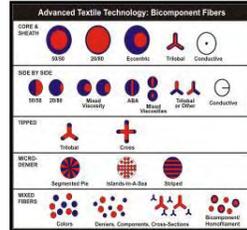
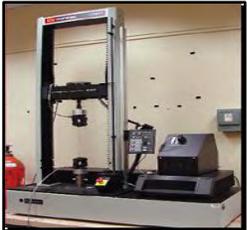


Fiber Center of Excellence

- One-of-a-kind bi/tri-component fiber extrusion capability that will enable the exploration of multi-functional fibers that are lightweight and reactive/responsive
- State-of-the-art analytical capabilities, thermal analysis transmission and scanning electron microscopy nuclear magnetic resonance spectroscopy, liquid chromatography/mass spectrometry, and X-ray diffractometry

Academia/Industry Links:

- Advertised to industry for collaborations, services and technology sharing
- Program Announcement seeking local partners is currently open

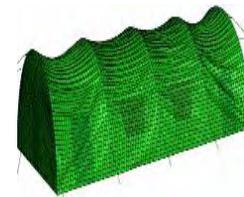
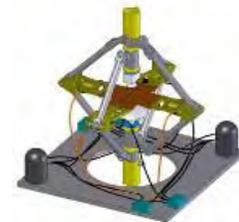


Center of Excellence for Inflatable Composite Structures

- Manage and guide widespread technology proliferation resulting from NSRDEC's Airbeam technology program
- Broaden applications and obtain patents
- Establish and validate analytical equipment and models
- Integrate airbeam technology into military systems – examples: Force Provider and Navy High Speed Vessel

Internal Capabilities Offered:

- Airbeam and airbeam system/component testing
- Airbeam modeling and analysis tools



Polymer Film Center of Excellence

- R&D of new plastics and nanocomposites formulations at lab scale production level
- Co-extrusion of multi-layer films
- Film characterization
- Extrusion and Compounding

Academia/Industry Links:

- Three Test Services Agreements in place to conduct barrier testing and to process multi-layer films
- Collaborations with several large packaging companies, film manufacturers and material converters



Virtual Design, Prototyping & Integration Capability/Facility

A new business area that utilizes on site capabilities to meet broad customer needs in the prototyping and small production areas

- Ability to respond with enhanced urgency and coordination/cooperation to outside customers
- Utilize the full combined capabilities of multiple installation organizations
- Augment prototyping capability with other capabilities such as behavioral sciences based assessments, anthropometric studies, hyperbaric chamber testing, environmental chamber testing (Doriot), and fiber development and extrusion
- Access Senior NCO network to address urgent emerging needs of deployed Warfighters
- Envisioned as a primarily Natick-run/Natick-operated capability augmented by industry and OGA partners
- Benchmarking other Centers operating PIF-like facilities



U.S. Army Research Institute of Environmental Medicine (USARIEM)

USARIEM is an internationally recognized center of excellence for Warfighter performance science and its useful applications. The institute functions as a world-class laboratory for environmental medicine, physiology, performance and nutrition research. It features integrated cellular, tissue, animal and human research programs.

As a subordinate lab of the U.S. Army's Medical Research and Materiel Command the institute produces a number of important products, including:

- Training policy and guidelines provide recommendations to enhance Soldier capabilities and reduce health risks
- Preventative medicine guidelines to save Soldiers lives and reduce lost duty time and medical costs
- Equipment improvements provide design specifications to enhance individual Soldier equipment and rations
- Monitoring strategies and predictive algorithms to prevent and detect performance decrements



U.S. Navy Clothing & Textile Research Facility (NCTRF)

Conduct research, development, testing, evaluation & engineering support for uniforms and personal protective ensembles

- **Current Focus Areas**
 - Task Force Uniform
 - Chemical/Biological Protective Ensembles
 - Firefighting & Flame Resistant Clothing
 - Protective Clothing & Equipment



U.S. Coast Guard Clothing Design & Technical Office (CDTO)

Ensures that the Coast Guard is able to procure the full range of uniform items, including clothing, footwear, insignia, and accouterments necessary to perform the Coast Guard's missions and to maintain the identity of the Coast Guard.

- Staff expertise in textiles, apparel design and manufacturing
- Design, development, and testing
- Specifications and patterns for uniform manufacturing
- Quality assurance and technical support to Coast Guard Exchange System



Product Manager Clothing and Individual Equipment (PM-CIE)

Develop, field and sustain, as part of an Integrated Warrior System, Individual Soldier Equipment for all Operational Environments within the Warrior Systems Architecture



Clothing & Individual Equipment

- Ballistic/Personal Protection
- Tactical/Environmental Clothing
- Individual/Unit Equipment
- Chemical Protective Clothing
- Personal Clothing
- Personnel Air Drop



Soldier Enhancement Program (SEP)



Product Manager Force Sustainment Systems (PM-FSS)

Develop, procure, and field quality Soldier support products required by the Soldier and the Force Projection Army. Responsible for the centralized management, program oversight, and direction for the development, production, and deployment of items in the Soldier support commodity areas.

- Cargo airdrop systems
- Laundries
- Showers
- Non-powered heaters
- Rigid and softwall shelters
- Field feeding equipment
- Force Provider system



Integrated Logistics Support Center (ILSC)

Serves the Soldier by providing a centralized management and staff supervision of its three (3) sustainment and readiness Product Support Integration Directorates (PSID). This is accomplished through managing ILSC's major and secondary items, acquisition logistics, and sustainment for TACOM items managed at the Natick, Rock Island and Philadelphia sites.

- Clothing & Individual Equipment
- Heraldics
- Protective Masks
- Chemical Individual & Collective Protective Items
- Chemical Agent Alarms/Detectors
- Smoke, Decontamination & Kits
- Personnel and Cargo Aerial Delivery Equipment
- Field Service and Field Feeding Equipment
- Force Provider
- Hard and Soft Shelters



U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC)



The U.S. Army Tank Automotive Research, Development and Engineering Center, located in Warren, MI.

TARDEC is the nation's laboratory for advanced military automotive technology, providing support through research, development, and engineering in order to leverage and integrate advanced technology into ground systems and support equipment.

TARDEC's researchers and engineers develop and maintain vehicles for all U.S. Armed Forces, many federal agencies, and more than 60 foreign countries.

TARDEC leads several Army Future Combat Systems science and technology efforts "collaborating with the Army's combat developers" to ensure that we field robust equipment that meets aggressive cost, schedule, and performance standards.

Website: <http://twww.tardec.army.mil/>

U.S. Army Simulation and Training Technology Center (STTC)



The U.S. Army Simulation and Training Technology Center is located in Orlando, FL.

STTC's mission is to enhance Warfighter(s) readiness through the research and development of applied simulation technologies for learning, training, testing and mission rehearsal.

An additional focus area is providing the Department of Defense and Department of Homeland Securities with state-of-the-art applied research and development of simulation technologies in areas such as human, agent, and teams, in a system of systems environment.

Website: <http://www.rdecom.army.mil/STTC/>

Aviation and Missile Research Development and Engineering Center (AMRDEC)



Located at Redstone Arsenal, AL, AMRDEC conducts research and exploratory and advanced development.

AMRDEC provides one-stop life cycle engineering support for aviation and missile weapons systems and unmanned aerial and ground vehicle platforms.

Website: [http:// www.redstone.army.mil/amrdec/](http://www.redstone.army.mil/amrdec/)

U.S. Army Materiel Systems Analysis Activity (AMSAA)



Located at Aberdeen Proving Ground, MD, AMSAA is the Army's Center for Systems Analysis.

AMSAA's mission is to conduct responsive and effective materiel and logistics systems analyses to support decision making for equipping and sustaining the U.S. Army.

AMSAA supports the Army by conducting systems and engineering analyses to support decisions in technology, materiel acquisitions and the designing, developing, and sustaining of Army weapon systems.

Website: [http:// www.amsaa.army.mil/](http://www.amsaa.army.mil/)

U.S. Army Research Laboratory (ARL)



The U.S. Army Research Laboratory is composed of six directorates and the U.S. Army Research Office. Primary Sites are located at Adelphi Laboratory Center in Adelphi, MD, Aberdeen Proving Ground, MD, White Sands Missile Range, NM, Research Triangle Park, NC, NASA-Langley in Hampton, VA, NASA-Glenn in Cleveland, OH.

ARL provides applied research in the areas of:

High Power Components, S3I Technology, Electronics and Electron Devices, Computational and Information Sciences, Atmospheric Sciences, High Performance Computing for Army applications, Robotics, Electric Gun Technology, Materials, Ballistics, Manufacturing Science, Soldier-Centered Analysis and Survivability/Lethality Analysis of Army systems, Atmospheric Investigations, Vehicles Structures, Technology and Propulsion Technology.

Website: <http://www.arl.army.mil/>

U.S. Army Armament Research, Development and Engineering Center (ARDEC)



ARDEC, located in Picatinny, NJ, is the Army's principal researcher, developer and sustainer of current and future armament and munitions systems.

ARDEC plays a key part in Army Transformation with its involvement in the development of Soldier and Future Combat Systems and continued efforts in the development of advanced weapons that exploit technologies like high-power microwaves, high-energy lasers and nanotechnology.

ARDEC's overall mission is to improve fielded items, develop new ones, maintain a strong armament technology base in government, industry and academia and provide technical support to the Soldier in the field.

Website: <http://www.pica.army.mil>

U.S. Army Edgewood Chemical and Biological Center (ECBC)



Edgewood Chemical Biological Center, located at Aberdeen Proving Ground, MD.

Principal research and development center for non-medical chemical and biological defense.

ECBC develops technology in the areas of detection, protection, and decontamination and provides support over the entire lifecycle - from basic research through technology development, engineering design, equipment evaluation, product support, sustainment, field operations and disposal.

Website: www.edgewood.army.mil/

U.S. Army Communications-Electronic Research, Development and Engineering Center (CERDEC)



CERDEC is the Army's information and technologies and integrated systems center, located at Fort Monmouth, NJ.

CERDEC's mission is to develop and integrate Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) technologies.

CERDEC's Command and Control Directorate; Intelligence and Information Warfare Directorate; Night Vision and Electronic Sensors Directorate; and Space and Terrestrial Communications Directorate conduct vigorous research and development programs, linking various technology producers including industry, academia and the foreign sector as well as other government agencies and services.

Website: <http://www.cerdec.army.mil>



Soldiers:
Our
Credentials

Natick Soldier RDEC (NSRDEC) is an active contributor to combat capabilities for:

TODAY & TOMORROW

NSRDEC provides essential capability and leadership across the human dimension

- Physical: Rations/nutrition, clothing, protective gear, airdrop, shelters, biomechanics, advanced materials, technologies to reduce logistics burden
- Social/cultural: Faith-based rations, field chapels, anthropometric applications
- Cognitive: Cognitive assessment, dismounted situational awareness, co-lead for Army Cognitive Performance Group
- **NSRDEC technologies save lives and improve combat quality of life**



RDECOM



NATICK SOLDIER RESEARCH, DEVELOPMENT AND ENGINEERING CENTER



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

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