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Countering Weapons of Mass Destruction

CONSORTIUM



**DoD RN Capabilities in an Era of Great
Power Competition**
CBRN Quarterly Forum



Virtual Meeting Etiquette

- Please make sure you mute yourself so we can avoid any noise interference
- This event is not open to press and media
- For best experience, set your screen to "Speaker View" (located in the top right corner".
- Enter all questions to the speaker in the "MS Teams Chat" box. Our moderator will share the questions with the speaker during the Q&A Session
 - "QUESTION: What successes are you proud of this week?"



National Defense Industrial Association

Chemical, Biological, Radiological, and Nuclear Division

Radiological Defense Panel Summary of Joint Requirements Discussion

Joint Requirements Office for CBRN Defense
24 March 2021
COL Eric B. Towns
703-571-3050

Agenda



- **Joint Programs of Record**
 - RDS
 - RIID
- **Questions**

Radiological Detection System (RDS)

BACKGROUND

Addresses lessons learned from Operation TOMODACHI

- Common, interoperable equipment
- Adequate sensitivity
- Common / standardized units of measure
- Timely transmission of data

Reduces life-cycle costs; replaces US, UK & Canadian meters

- USA & USMC AN/PDR-77
- USA AN/VDR-2
- USAF ADM-300
- USN & USCG Multi-functional RADIAC Suite (begin obsolescence FY20)

PROBES



CAPABILITY

Detect, classify, and measure radioactive materials for operational and occupational levels and quantities

- Alpha, beta, gamma, neutron, and low-energy x-rays

Modern capability upgrades

- Open architecture
- Smart probes
- Net Ready
- Global Positioning System (GPS) interface
- Data logging

INTEROPERABILITY



Radioisotope Identification Detector (RIID)

BACKGROUND

Addresses lessons learned from Operation TOMODACHI

- Common equipment & adequate sensitivity

Supersedes aging and obsolete detectors

- GR-135, identiFINDER, and SAM-940

Increment 1 RIID (non-networkable) is funded.

- USAF is the only Service participating in Inc 1.

Increment 2 (networkable) funding removed during 2019 Defense Wide Review.

- All other Services were to participate in Inc 2, but now unknown

CAPABILITY

Timely, improved identification of radiological materials based on gamma signatures

Analyzes incoming energy spectrum

- Uses onboard algorithm to compare measured gamma energy/energies w/ known radioisotope reference energies
- Reports most likely radioisotope based on confidence level

Inc 1 RIID (non-networkable) transfers data via USB, RJ45 cable to a separate stand-alone, non-networked, computer

EXAMPLES



Note: Images are examples and not the actual system.

INTEROPERABILITY

RIID Inc 1

- Non-networked (wireless firmware turned OFF)
- Data transmission via cable to download data to computer

RIID Inc 2

- Same as RIID Inc 1, except wireless firmware turned ON
- Network capable (Wi-Fi, Bluetooth, radio or cellular)
- Data transmission via wireless or a cable to download data to computer



Questions



DTRA Radiological and Nuclear Detection Science and Technology Development

Briefer: Mr. Tom Cartledge

Date of presentation: 24 March 2021

Email: thomas.e.cartledge.civ@mail.mil

Phone #: 571-616-5813

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Why S&T for Radiation Sensors?



The physics of radiation detection is well understood and we are basically using the same materials for the last 20-30 years?

No! Modern radiation sensor have greatly improved performance compared to those of the 1980's:

- New and better materials (dual-mode, semiconductors)**
- Improved electronics (power, speed, circuitry)**
- On-board computation (“expert in a box”, decision support)**
- Network and local connectivity**

Modern updates allows for greater mission agility and improved performance



A New Approach - Configurable Systems



RN detection systems that are adaptable and reconfigurable to support changing missions: search, hazard mapping, homeland, nuclear forensics, etc...

Open architecture (JADC2 concepts):

- Network agnostic
- Operated in an evolving C2 system
- Integrates with CBRN and non-CBRN sensors
- Common components



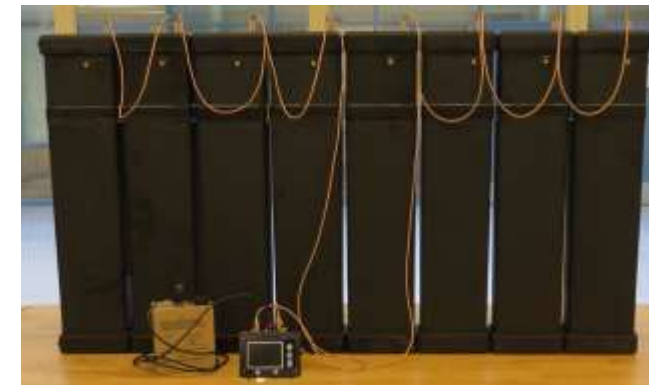
43rd Civil Support Team (CST)
DVIDS Photo ID 6012115



TAK integration



Backpack



Aerial/mobile configuration

No longer a unique detector for a unique mission



Diverse Applications, Common Components



Spectral Radiation Monitor (SRM): Handheld gamma/neutron detector, spectroscopy, isotope ID, optimal SWAP

SRM-Air: Same capability as SRM, integrates to land, air, and underwater unmanned vehicles

Modular Vehicle Detection (MVD): Modular Open architecture, gamma & neutron, robust RN detection, mounted or backpack, TAK compatible

Modular Vehicle Detector (MVD)



OR

SRM & SRM-Air





More Agile and Integrated CBRN Platforms



- Warfighter wants integrated capabilities
- Historically it has always been NBC or CBRN
- Common challenges (CBRN Support to Command and Control):
 - Supporting the warfighter
 - Data sharing
 - Surveying large areas
 - Warning and reporting
 - Unmanned platforms
 - Autonomy



<https://www.dvidshub.net/video/783745/usaf-cbrn-rs-demo>

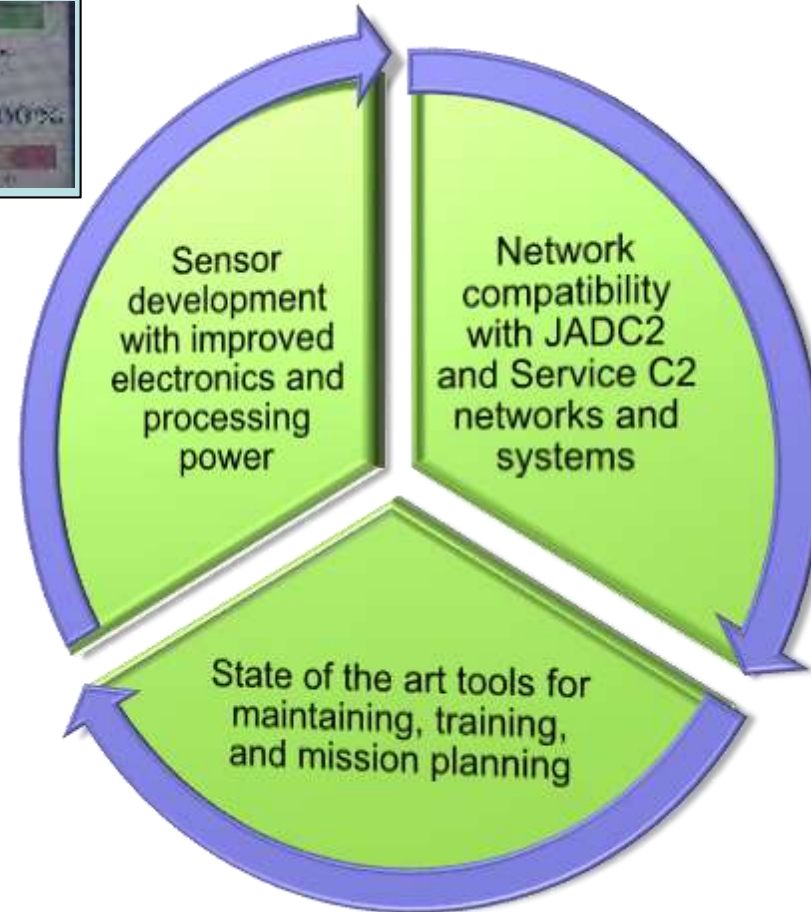
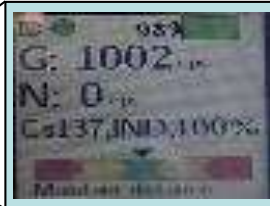


Keeping Pace with Change

Sensor to Warfighter Development Concept



Sense and Communicate



Process and Inform



Training and Planning



Maintain and Sustain

Future warfighter growing up with smart phones, video games, YouTube, virtual classes, and distance learning



Thoughts on the Future ...



New Capabilities:

- **Automated warning, reporting, and Mapping (2 & 3 Dimensional)**
- **Deploy and Forget sensors**
- **Exploitation of existing sensor data (BNRN and Non-CBRN sensors)**
- **Wearables – warfighter as a sensor (software and hardware)**
- **Unmanned systems**

Challenges”

- **Defining current and future architecture**
 - **Data flow**
 - **2D vs 3D mapping**
 - **Evolution CBRN reports and FM radios**
 - **Tactical edge computing**
- **Cyber security/bluetooth/wireless**



Questions



Marine Lance Cpl. Lusung is a chemical, biological, radiological and nuclear defense specialist with Marine Wing Headquarters Squadron 2.

DVIDS Photo ID 5974051



JPEO-CBRND

Preventing the Worst by Providing the Best

JOINT PRODUCT OFFICE FOR RADIOLOGICAL AND NUCLEAR DEFENSE UPDATE FOR INDUSTRY

Mr. Christopher R. Seacord
Joint Project Manager CBRN Sensors

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PROTECTING THE JOINT FORCE



PROTECT



UNDERSTAND



MITIGATE

MISSION

Protect the Joint Force from weapons of mass destruction by generating affordable capabilities.



VISION

A resilient Joint Force enabled to fight and win unencumbered by a chemical, biological, radiological, or nuclear environment; championed by innovative, agile, results-oriented acquisition professionals.

RADIOLOGICAL DETECTION SYSTEM (RDS)



Description:

- The Radiological Detection System (RDS) will replace DoD's legacy Radiation Detection and Computation (RADIAC) survey meters as well as USCG, UK, and Canadian legacy systems. The RDS will provide the Warfighter with the capability to detect alpha, beta, gamma, neutron, and low-energy x-rays.

Status:

- Low Rate Initial Production (LRIP)

Opportunities for Industry:

- Request for Information (RFI) released in December 2020 – Reviewing responses
- Govt investigating a 5-year Indefinite Delivery, Indefinite Quantity (IDIQ) for the full rate production of the RDS

VEHICLE INTEGRATED PLATFORM ENHANCED RADIAC (VIPER)



*Mounted inside vehicle
(previous AN/VDR-2 or
AN/UDR-13 location)*



Army
Aircraft

Description:

- VIPER is a small radiation sensor that modernizes the Army's capabilities to monitor for platform crew exposure to rad/nuc hazards. The system mounts within the crew compartment of multiple U.S. Army ground and aviation platforms. It provides gamma dose rate, gamma dose, and gamma/neutron (i.e., prompt) dose measurements in a small, ruggedized form factor.

Status:

- Being developed for NBC-RV vehicle
- Working on requirement for all Army vehicles development

Opportunities for Industry:

- None currently
- Will probably have to recompile for production for deployment to all vehicles (Expected date: TBD)

CBRN-SENSORS INTEGRATED ONTO ROBOTIC PLATFORMS (C-SIRP)



Man Transportable Robotic System (MTRS)



Unmanned Aerial System (UAS)



Unattended Ground Sensor (UGS)

* Pictures Notional – Not to Scale

Description:

- Developmental radiological and nuclear detection capabilities for the Operational Force Commander integrated onto fixed wing and quad/octo-copter UAS and unattended ground sensors designed to search, find, and track radiological materials of concern using miniaturized emerging technologies transitioned from DTRA and NA22

Status:

- Being developed for demonstration, testing, and determination of requirements

Opportunities for Industry :

- None currently
- Will probably have to recompile for production once exact requirements are determined (Expected date: TBD)

ADVANCED RADIOLOGICAL NUCLEAR DETECTION FAMILY OF SYSTEMS (ARND FOS)



Description:

- Leverages commercial-off-the-shelf aircraft-mounted and vehicle-mounted gamma and neutron detection technologies to provide technical forces with wide area detection search/find capabilities.

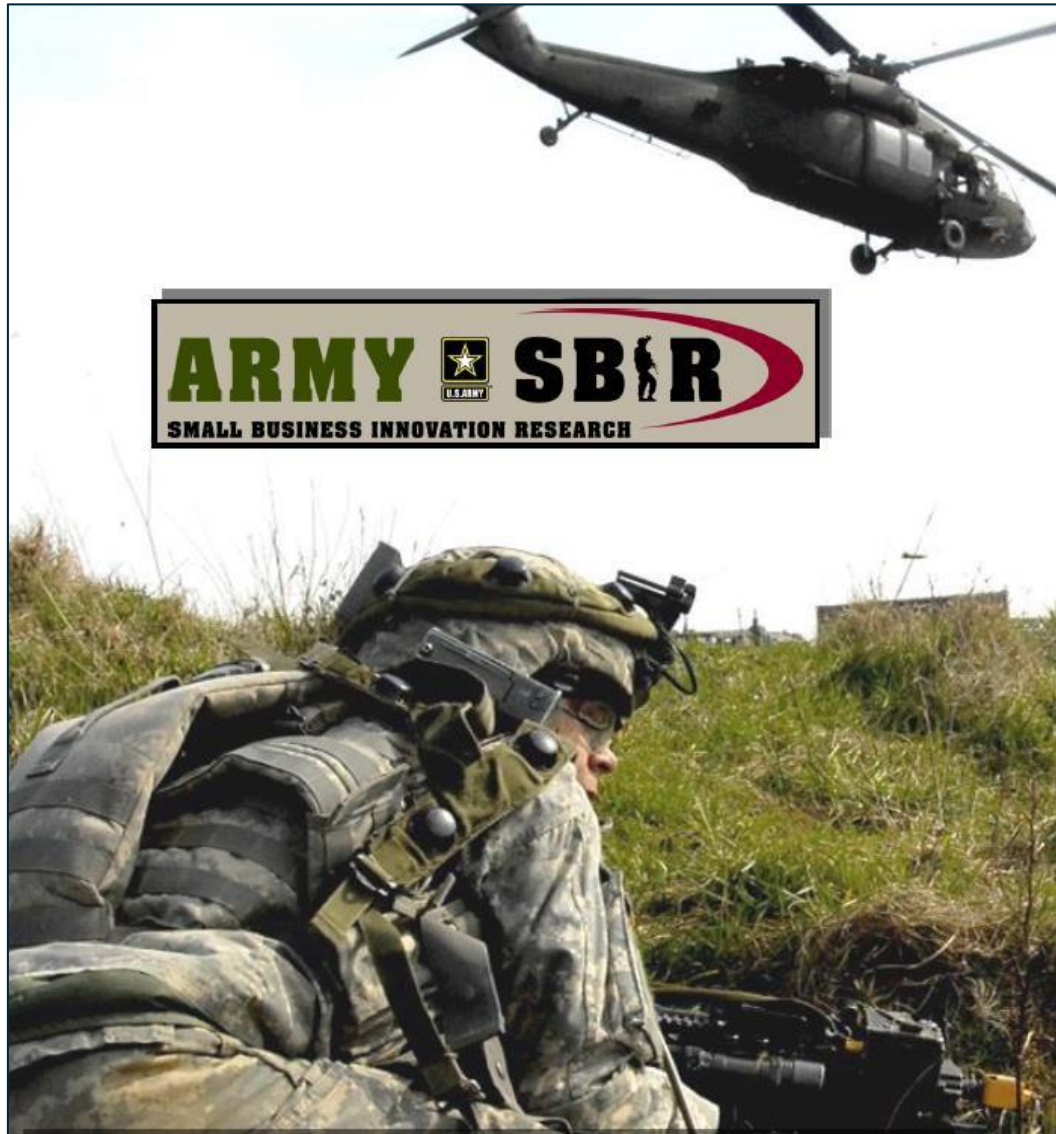
Status:

- Extended Early User Assessment in USFK (Delivery to USFK postponed due to COVID 19)
- Have signed Requirement Document
- Waiting funding from Army G8 (not currently in the POM)

Opportunities for Industry:

- Will compete for production contract once funded (Expected date: TBD)
- Hope to move straight into testing of prototypes (similar to RIID-FOS)
- DTRA supporting development of similar devices

ARMY SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)



Description:

- Funding small businesses for research into technologies of benefit to making radiation detectors better, cheaper, and more rugged.

Status:

- Two phase I SBIR (~110 k each)
 - Nuclear survivable replacements for GM tubes
- Three phase II SBIR (~1M each)

Opportunities for Industry:

- Usually new phase I each year or every other year:
- Possible topics:
 - Advanced counting statistics
 - Rugged contamination and low cost probes

The right technology,
at the right time,
in the right place
and for the right cost.

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Question & Answer

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Thank You!