

ABERDEEN PROVING GROUND ADVANCED PLANNING BRIEFING TO INDUSTRY

Joint Project Manager for Radiological and Nuclear
Defense (JPM-RND)

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5 November 2015

The forecast data is for planning purposes, does not represent a pre-solicitation synopsis, does not constitute an invitation for bid or request for proposal, and is not a commitment by the government to purchase the desired products and services

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JPM-RND MISSION, VISION, & FUNDING

Mission: The Joint Project Manager for Radiological and Nuclear Defense is responsible for research, development, acquisition, fielding and life-cycle support of joint radiological and nuclear defense systems supporting the National Military Strategy.

Vision: Collaboratively develop and deliver Radiological and Nuclear Defense capabilities to support our warfighters, our nation, and our allies.

Joint Funding: Office of the Asst. Secretary Defense (Nuclear Chemical Biological) Nuclear Matters funds RDT&E and a small amount of Procurement Services' POMs augment the joint procurement to cover the majority of the total system requirement.

Army-specific programs (i.e. Man-portable Radiological Detection System): Army G8, Army Reserves, and Army National Guard provide funding.



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JPM-RND CURRENT PORTFOLIO

JPM RND Objectives

- Upgrade & Modernize capabilities
- Data transmission to provide Situational Awareness (SA) & enable reach-back
- Inform future programs through ATDs
 - Speeds up development
 - Reduces acquisition risks

CURRENT PROGRAMS

Contamination Monitoring



NOTIONAL
DIAGRAM

**Radiological
Detection System**



**Joint Personal
Dosimeter - Individual**

FUTURE FUNDED PROGRAMS

Medium Res 1-3% **Palm-sized**
Low Res > 3%



RIID Family of Systems

- FY18 Start
- FY19 Contracting
- One variant at a time
- CDD to be developed



**Vehicle
Ship
Aerial
Installation**

**Platform Mounted
Detection Systems**

- FY21 Start
- FY22 Contracting
- One variant at a time
- CDD to be developed

PHOTOS FOR ILLUSTRATION PURPOSES ONLY

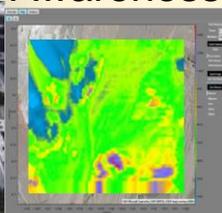
Backpack
Detector



HPGe



Situational
Awareness



**Man-portable Radiological
Detection System**

- FY17 Start
- FY18 Contracting
- CPD approved by AROC

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JPM-RND UNFUNDED FUTURE PORTFOLIO

Advanced RN Detection Family of Systems



- Airborne & Vehicle Search, ID, & Forensics for special materials
- Capability Production Document World Wide Staffing 2Q FY16

Joint Personal Dosimeter - Squad



- FY21 Program Start being requested in the Army POM
- FY26 Procurement scheduled in Army long-range plan
 - Dose of record capable
 - Provides Dose Rate
 - Data transmission for situational awareness

Stryker NBCRV RN Sensor Upgrade



- Replace and upgrade aging RN detection capabilities
 - Isotope detection?
 - Limited remote detection?
- FY16 Analytical Study on solution alternatives based on size, weight, and power constraints
- Funding will be requested in FY19-23 Army POM

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RN SENSE VISION

Current

STAND ALONE DETECTORS



Navy



Air Force



Army

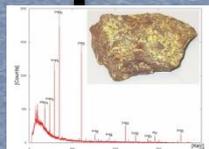


SINGLE DETECTOR FOR ALL SERVICES

SEARCH FOR THREAT SOURCES



Single RADIAC for DOD (Example)



Isotope Identification



Mid-Term



Detection

TAG, TRACK, AND LOCATE



Search for Threat sources



RadCam

FORENSICS

IMAGING

BUILT IN SENSOR TECHNOLOGY

Far-Term



Albatross class fleet ocean lift ship



MQ-30 Fire Scout



Dedicated terminal at ship

STANDOFF DETECTION FOR THREAT SOURCES

FORENSICS AUTONOMOUS ROBOTICS



Self Detecting Materials

Immediate Threat Detection



Ensemble and Material Integrated Sensors

Multi-sensor analysis

SELF DETECTING TECHNOLOGIES

REALTIME INTEGRATED DOSIMETRY

OCCUPATIONAL AND BATTLEFIELD DOSIMETRY

Dosimetry

BATTLEFIELD DOSIMETRY

LOW-LEVEL DOSIMETRY

DATA ACQUISITION
Machine language or single sensor information



INFORMATION DEVELOPMENT
Connections or visualization to provide insight



ACTIONABLE INTELLIGENCE
Intentions or actions



"Photos for illustration purposes only"

JPM RND PROGRAM SPECIFICS

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JOINT PERSONAL DOSIMETER REQUIREMENTS

Individual

- Same performance requirements as Navy Battlefield Dosimeter
- Plus data transfer and NVLP accreditable
- Army Acquisition Objective: approximately 800,000 dosimeters
- Replaces Army's PDR 75 series dosimetry system

Squad

- Same dosimetry requirements as Navy Battlefield Dosimeter
- Plus full spectrum dose rate (Fukushima reactor accident – tactical nuclear attack)
- Army Acquisition Objective: Approximately 78,000
- Replaces Army's UDR 13/14 series dosimeters (total dose and dose rate)

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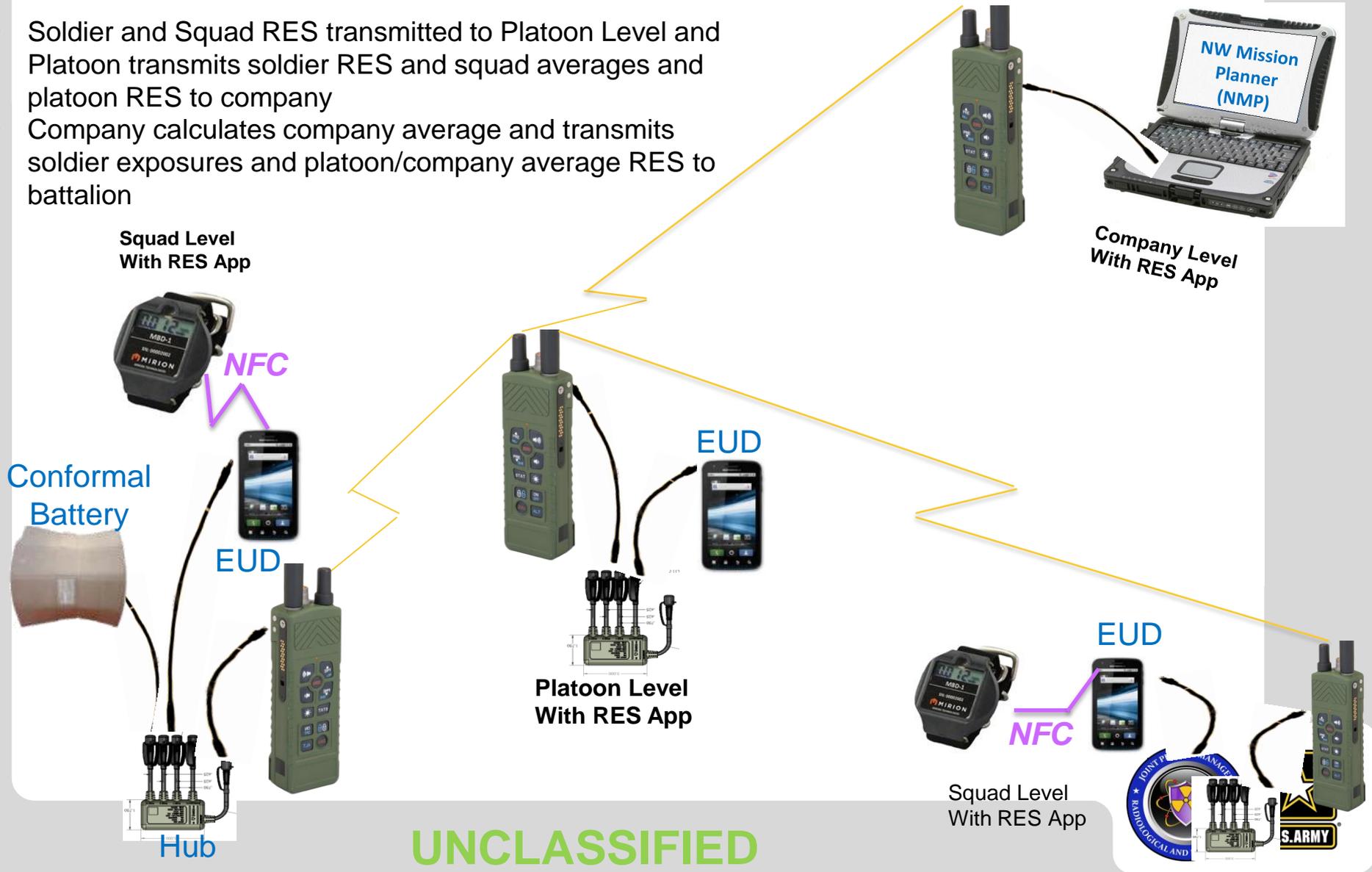
JPD INDIVIDUAL DATA TRANSFER

- x **Blue Tooth & Wifi – With distributed ground battlefield operations provides security risks that are not acceptable by the National Security Administration**
- ✓ **Near Field Communications (NFC) – Approved for use by National Security Administration**



JPD Individual - Connectivity Using NFC & PRC-154A radios using NET Warrior from soldier through Squad, platoon and Company

- Soldier and Squad RES transmitted to Platoon Level and Platoon transmits soldier RES and squad averages and platoon RES to company
- Company calculates company average and transmits soldier exposures and platoon/company average RES to battalion



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ARMY JPD INDIVIDUAL DECISION DRIVERS

Although not a requirement for the Navy, data transmission is a Key Performance Parameter for the Army – Must have.

- **Requires transmission using an acceptable transmission medium: USB or NFC not blue tooth or WiFi**

Total Lifecycle Cost is also a key driver. If the JPD individual cost is too high then the Army may decide to stay with the latest PDR 75 series variant (PDR 75A OSL dosimeter with reader) since the PDR 75A reader can be modified to meet JPD transmission requirements.

- **Critical Cost Factors:**
 - **Purchase price**
 - **Calibration costs**
 - **Length of lifecycle**



JOINT PERSONAL DOSIMETER-INDIVIDUAL (JPD-IND)

GENERAL INFORMATION

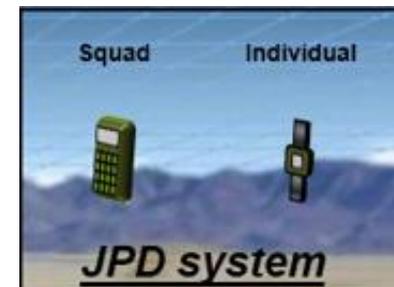
- RDTE is Defense-Wide funded to achieve Joint interoperability between services to increase capability and reduce life-cycle costs, as well as address Operation TOMODACHI Lessons Learned for common, interoperable equipment with adequate sensitivity and common units of measure.
- USN initiated their Navy Battlefield Dosimeter program in FY13 since JPM-RND had not yet received Defense funding and they had an immediate need to replace legacy Medical Devices. USN included all Services in the creation of their Specification that was approved by Bureau of Medicine and Surgery (BUMED).
- Intent for collaboration to reduce schedule timeline and cost by procuring off of the USN contract vehicle and buy EOQ.
- Potential Users: USN & USA

KEY PROGRAM DEVELOPMENTS

- Material Development Decision achieved 2012
- Navy contract awarded 4QFY15

FUTURE CONTRACTING OPPORTUNITIES

- **No definite opportunities for JPD-IND (?)**



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JPD-INDIVIDUAL CONT'D

Description / Capabilities:

The Joint Personal Dosimeter (JPD) is intended to replace DoD's legacy dosimeters (the Navy's IM-270 and the Army's PDR-75 reader with the DT-236 watch). The JPD will provide a sensor to record and retrieve a Service member's radiation exposure from occupational to tactical levels. JPD is leveraging an ongoing Navy effort to replace the IM-270 with an objective of providing the Navy, Army and Marines with a common dosimeter.

Capability Improvements over the Legacy System:

- No separate reader needed to obtain dose information
- Data Transfer from dosimeter to computer
- NVLAP Accreditation to obtain Dose of Record to be inputted into Individual's Medical Records

Legacy System:

- A/N PDR-75A and DT-236A
- A/N PDR-75 and DT-236
- Navy IM-270

Status of Legacy System:

- No longer in production
- Obsolescence Issues
- Does not meet the current needs of the Services

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Navy Battlefield Dosimeter

*Legacy systems include 100 Passive Dosimeters to 1 Passive Reader resulting in 1,059,800 dosimeters

** dosimeters

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JOINT PERSONAL DOSIMETER-SQUAD (JPD-SQD)

- JPD-SQD will provides significant improvements over legacy UDR-13 legacy system that is nearing obsolescence
 - More sensitive
 - Smaller and lighter
 - More precise dose rate
 - Appropriate for complete range of operations from consequence management to nuclear war

***Anticipated Program Start in FY21 with Contract Efforts in FY22**

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RIID FAMILY OF SYSTEMS

MINI RIID

Cell phone size low resolution RIID designed to provide low cost presumptive ID of Isotopes for forces who have a probability of encountering radiological materials during their mission

Networkable: allows sending of spectrum to higher headquarters so that the location can be prioritized and added to target list of potential sensitive sites requiring exploitation

Leverages development off of DARPA Sigma project that is procuring 10,000 @ approx. \$400 ea.; project finishes in FY17

Low Resolution RIID

- Modernization of service's current Sodium Iodide (NaI) RIIDs; many purchased after 9-11 with O&M and no sustainment (repair parts, maintenance contract or calibration, etc.)
- **Networkable:** To be determined based on requirements established by the RN ICT.
- Potentially leverages off of DHS' Domestic Nuclear Defense Office's procurement of new NaI RIID assuming requirements are comparable.
- May require modification of DNDO COTS solution to meet possible militarization & networking requirements

Medium Resolution RIID

- Improved energy resolution than NaI gamma RIIDs which are 6% to support high confidence presumptive ID to upgrade Dismounted Recon SKO capability
- Available technologies/energy resolution: LaBr (3% gamma), CLYC (4% for Gamma & neutron), CZT (1-1.5% gamma)
- **Networkable:** enables sending of spectrum to higher headquarters after assessment of sensitive sites and completion of initial entry operations to prioritize exploitation operations
- Leverages off of results from JPEO JCACS ATD

Directional RIID

- Provides indication of direction of location of the isotopes of interest in addition to medium resolution presumptive identification capability either through visualization on tablet or direction arrow on sensor
- Available technologies: CZT or HPGc (0.5% gamma)
- **Networkable:** enables directionality to be sent to higher headquarters or to characterization team to support exploitation operations
- Leverages off of results from JPEO JCACS ATD
- Use: TBD – may be specialty equipment only or combined with Medium RIID depending on cost



MEDIUM RESOLUTION RIID

- Mission: Hand-held, networked, presumptively detect, identify and characterize Radiological Isotopes.
- Program Objective: Modified COTS (pending requirement) for various mission uses such as sensitive site assessment and exploitation, vessel board search, etc. to modernize the capability, eliminate redundancy, improve interoperability, and provide sustainment
- Potential Application: USA, USMC, SOCOM
- **FY18 start in FY17-21 POM as placeholder – Depending upon decisions by community Medium RIID could be postponed with decision to start Mini, low or direction RIID first since JPM RND only has adequate funding to develop & procure one RIID at a time**

***Looking to replace low-resolution RIIDs in DR SKO with medium-resolution (LaBr or better)**



Example only

Exact Form Fit and function TBD

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EMERGING REQUIREMENTS FOR ARND FOS

DESCRIPTION

Advanced Radiological Nuclear Detection Family of Systems (ARND FoS) – Leverages commercial-off-the-shelf aircraft-mounted and vehicle-mounted gamma and neutron detection technologies used in the Smart Threads Integrated Radiological Sensors (STIRS) Joint Capability Technology Demonstration (JCTD) to provide technical forces with wide area detection search/find capabilities.



- **Anticipated Program Start FY19 based on availability of funding**

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AERIAL RADIATION DETECTION IDENTIFICATION AND MAPPING SYSTEM (ARDIMS)

- Transportable aerial systems are highly specialized.
- The ARDIMS consists of two mountable pod versions for use with manned and unmanned helicopters.
- The pods are flight certified, waterproof, and high-shock designs including a spectroscopic gamma / neutron gross counting pod pods.
- ***Program start in FY23/Contract Efforts in FY**
- ***POC is Mr. John Wagner, john.h.wagner.civ@mail.mil (410) 436-1436**



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VEHICLE MOUNTED DETECTION SYSTEM (VMDS)

- Available in mobile, transportable, and custom configurations
- Gamma and neutron sensitivity
- Dual mode: mobile or stationary
- GPS enabled
- Water resistant
- Mobile mode operates at speeds up to 20 mph (32 kph)
- Isotope ID
- ***Program start in FY23/Contract Efforts in FY**
- ***POC is Mr. John Wagner, john.h.wagner.civ@mail.mil (410) 436-1436**



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PLATFORM MOUNTED RADIAC – (VEHICULAR RADIATION POINT DETECTOR) (VRPD)

- Mission: Rugged networkable point detector that is man-wearable and can be integrated onto vehicles, ships and fixed sites to provide warning and situational awareness for crews and personnel and support mounted RN recon. Wide operating range of detection to include low level, prompt neutron/gamma detection. Replaces Army's analog non-networked UDR-13/14. Provides warning of detected radiological hazards, turn-back dose and Operational Exposure Guidance (OEG) to enable personnel to take protective measures until they can depart the area. Designed to meet mission critical platform radiological survivability requirements.
- Program Objective: Modified COTS for uses on various manned/unmanned, ground/air/sea platforms, fixed sites; and man-wearable
- Potential Application: USA, USMC, USAF, SOCOM, USCG platforms
- **FY20 start in FY17-21 POM as placeholder – Depending upon decisions by community other variant may be selected for development and procurement first**

Vehicular Mounted Used As Example – Type of Platform TBD BY ICT – Anticipate Multiple Variants



Examples only



Exact Form Fit and function TBD

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MAN-PORTABLE RADIOLOGICAL DETECTION SYSTEM (MRDS)

Man-portable Radiological Detection System

- System of Systems with three elements: Detection, Communications, and Situational Awareness to:
 - Counter Nuclear Threats: provides capability for DoD to rapidly search during Sensitive Site Assessments and definitively find SNM and weapons during Sensitive Site Exploitation missions; supports interdiction of known or suspect areas for radioactive devices, SNM or weapons
- Support NTNF collection with isotope detection
- System includes:
 - Man-portable backpack: 10-15 meter standoff gamma/neutron detection to provide rapid presumptive ID
 - High resolution RIID (HPGe gamma) to provide field confirmation of SNM
 - SA software to monitor mission progress, analyze detection data to develop information to send to HQS and reachback
 - Radios and computers for to facilitate NRT SA



***Army Funded with FY17 Program Start and Contract Efforts in FY**

USERS: Army, SOCOM, Air Force, DNDO, International

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MAN-PORTABLE RADIOLOGICAL DETECTION SYSTEM (MRDS)

Mission:

- Provide networked, improved RN detection, localization, and presumptive and field-confirmatory identification capabilities in near-real-time to enhance tactical level situational awareness.

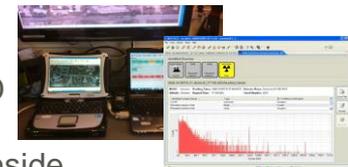
Detection/Identification

- Hands-Free Detector (Backpack): Detects neutron and gamma and presumptively identify SNM.
- High Resolution RIID: Allows field-confirmation of SNM.



Situational Awareness Tools

- Laptops & Mobile Field Kit – CBRN Software:
 - COTS laptops with Gov't owned software DTRA & Asynchrony developed from EOD software
 - Can remotely monitor and track sensors; draw feature to indicate areas of interest inside the facility; and a chat feature to keep teams and command post informed



Communications

- GOTS radios provide C2
- Used as “breadcrumbs” to retransmit from inside facilities with 1’ thick, solid, poured concrete walls



Miscellaneous

- NET Warrior – Hub, Cables, End User Device, Conformal Battery
- Transportation Cases



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MRDS CONT'D

Description / Capabilities:

- Hands-free sensors used to provide 10-15m standoff to conduct rapid area assessments of facilities and presumptive identification of Special Nuclear Materials (SNM)
- Hand-held sensors used to confirm or deny the presence of SNM
- Radios provide command and control and enable voice and data retransmission from inside facilities with thick concrete walls
- A Situational Awareness (SA) Tool on eight laptop computers supports near-real-time remote sensor monitoring and tracking, allows an initial entry team to identify areas for exploitation, and provides a chat feature to update mission progress



Hands-Free
Sensor



Hand-Held Sensor

Capability Improvements over the JCTD System:

- Detectors are lighter and more sensitive
- GOTS radios ensure interoperability within the Service
- SA Tool software transitions to JPM RND for continuous improvement & integration onto tactical networks
- Transition to POR provides logistics and sustainment

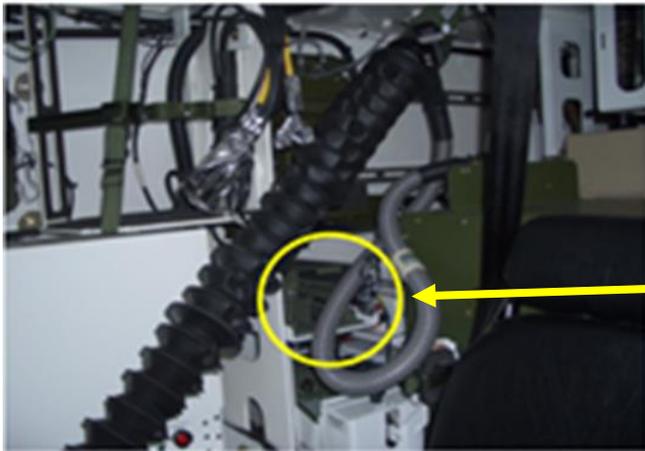
***Program Start in FY17 with contracting effort to begin in FY18**

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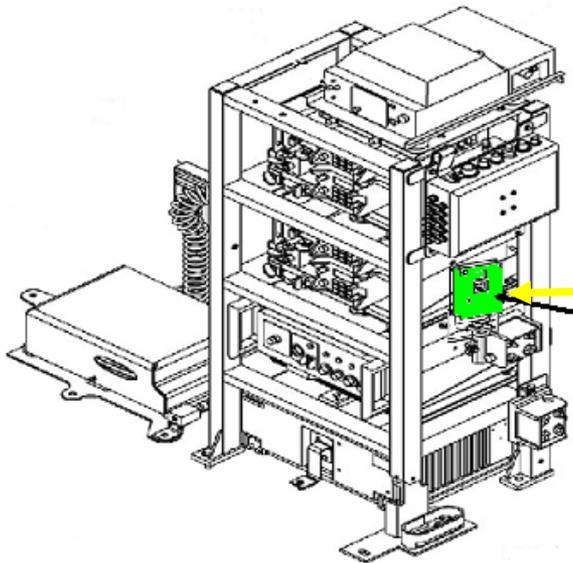
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NBCRV STRYKER RN CURRENT CAPABILITY UPGRADE



AN/VDR-2 RADIAC Set: Detects, measures, and displays level of gamma radiation and beta particles. The AN/VDR-2 also measures, stores, and displays accumulated dose rates. It can display radiation dose rates both inside and outside the vehicle.



AN/UDR-13 RADIAC Set: A miniaturized radiacmeter that detects neutron/gamma radiation dose and gamma dose rate. Located on the C4ISR rack.

Current capability reaches obsolescence starting in 2020.
Envision new capability to provide isotope detection capability for first time in NBCRV.

NBCRV STRYKER CONT'D

CURRENT STATUS

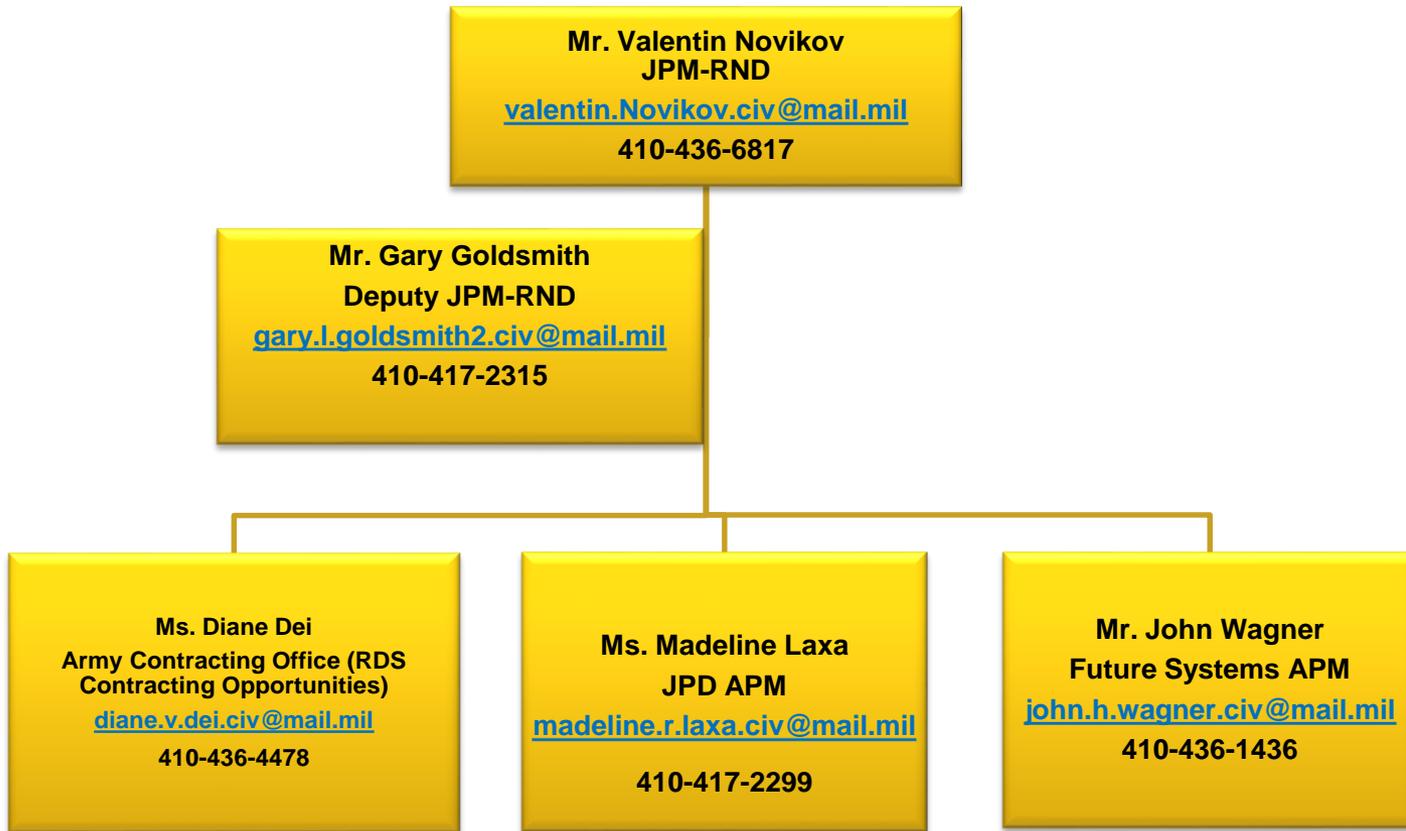
- NBC Stryker utilizes NBC sensor suite for situational awareness and warning messaging.
 - NBC Stryker currently uses AN/VDR-2 and AN/UDR 13 for RN Detection.
 - AN/VDR-2 and AN/UDR 13 Obsolete by 2020.
 - Upgrades to chemical and biological detection suites frees up size, weight and power for possible improvement in RN detection and identification capabilities.
 - MSCoE has requested isotope identification and standoff detection.
-
- JPM-RND purchasing and testing 3 prototype COTS systems to address interior mounted radiation detection and capabilities for PM Stryker.

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JPM RND POINTS OF CONTACT



QUESTIONS?

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