Rad Responder

National Radiological Emergency Preparedness Conference

April 23, 2012
HOUSEKEEPING
Objectives

• Provide an overview to participants of the history behind and evolution of the Rad Responder network

• Provide specifics as to the features and functions of the individual components of the Rad Responder network
Objectives (2)

- Allow respective Federal Departments and Agencies to provide their perspectives on the importance of the network
- Through a series of hands on stations, allow participants the opportunity to interact with various Rad Responder tools in a small group setting.
Agenda

- 8:00 am to 8:10 am – Introduction/Housekeeping
- 8:10 am to 8:30 am – History and evolution of the concept
- 8:30 am to 8:40 am – DFM and DDFM details
- 8:40 am to 9:00 am – FEMA’s perspective
- 9:00 am to 9:10 am – Rad Responder Lite development
- 9:10 am to 9:20 am – Tying it all together
- 9:20 am to 9:45 am – Panel discussion
- 9:45 am to 9:55 am – Break/hands-on setup
- 9:55 am to 11:45 am – Hands-on session

FEMA
RAD RESPONDER HISTORY AND BACKGROUND
eFRMAC Components

- Tablets
- Software
- Technical Integration
System Description and Evolution

• Paperless FRMAC – DFM to RAMS
• RadResponder PC-based D-DFM
• RadResponder Lite Android & iPhone RaaS to SLTTs
• Bluetooth connectivity between data tablets and detectors to eliminate human interface error; Automate transfer of readings from a detector to tablet and then to RAMS
• Deployment Examples & Lessons Learned
Proposed RAMS Architecture

Responder Type
- **LEVEL 1** Rad Responder
- **LEVEL 2** Rad Responder
- **LEVEL 3** Rad Responder

Definition
- Federal Monitoring Teams
- State and Local Rad Teams
- First Responder, HAZMAT, JIT

Tool
- Digital Field Monitoring (DFM)
- Distributed Digital Field Monitoring (DDFM)
- RAMS as a Service (RaaS)

Federal, State, Tribal and Local Government Users
Existing Capabilities and Integration (1)

• Complex Emergency Scenarios
• Standardized data collection
• Gather information faster and more accurately to support decision makers to make timely lifesaving decisions
Existing Capabilities and Integration (2)

• Employ the same tool for everyday routine monitoring and sampling and emergency situations to improve readiness
• Data input directly to FRMAC: Significant improvement over paper and pencil data collection and transmission
• Whole Community Effort: Promotes continuous Federal support to SLTTs and intragovernmental partnership
FRMAC Advances in Data Management

The eFRMAC Electronic Data Management Enterprise
FRMAC Support

• Immediate Remote Support
  - Data Collection
  - Projection Models
  - Map Products
  - Guidance

• Rapid ground support
  - Field Teams
  - Aerial Teams
  - Data Infrastructure
  - Map Products
  - Guidance

• Follow on support – more of the above
eFRMAC Goals & Objectives

• Goal – More Data, Faster, with Greater Reliability
• Telemetry, Automation, and Networking
• Objectives
  □ Acquisition of field data
  □ Collaboration across emergency response communities
  □ Streamlined analysis
  □ Dissemination of products
Enabling Technologies

- Multi-Path Communication Device (MPCD)
  - Wireless to Data Tablet
  - Multiple Communication Pathways
  - All Data Buffered Locally
  - One Button Operation
  - 50 Systems in 8 RAP Regions
Digital Field Monitoring

• Data Tablet - Replaces Paper Forms
  - Touch screen emulates paper
  - Imbedded GPS
  - Two-way data flow
  - Fields updated in near real-time
  - Bluetooth connections to Instruments
DFM Measurements

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RAMS Desktop and Basic Navigation
• RAMS is the Radiological Assessment and Monitoring System
• Browser Based
• Data Management
  • Personnel
  • Instrumentation
  • Measurements
  • Samples
• Action items
• Work products
RadResponder Pro Overview

• Re-usable software modules for the collection of field data across the entire mission space.
  - Field Data Collection from Deployed Instrumentation
  - Sample Collection and Management
  - Telemetry
  - Sync with FRMAC and between teams
  - Switch view from laptop to tablet
  - Simple data viewer
  - Mapping Application

• Ultimately the data collected and synchronized in the field can also be packed and transmitted to organizations that require either summaries of the activities or access to unprocessed data.
Mapping
Data Entry and Management
Synchronization and Conflict
Settings and Help
eFRMAC Enterprise Solution

• Not just a piece of software or hardware
• Automation of entire workflow process
  - 17 Government Agencies
  - Rap Regions – 24 MPCDs deployed to 8 RAP Regions
  - State and Locals

• Collaboration
  - 5 year effort
  - HQ Project direction

• Contributors
  - Remote Sensing Laboratory – Nellis Ops
  - ORISE - Chain Bridge Technologies
  - LLNL NARAC
  - Sandia
The Need

- DHS Strategy + lessons learned from Fukushima response recognize the need to rapidly characterize a catastrophic rad/nuke incident

- Need tools designed for first responders to serve as force multipliers while awaiting specialized assets
Rad Responder Lite

Machine-to-Machine Integration
- Common protocols
- Easily adaptable WebService based API
- Accessible by any authorized emergency response organization

Person-to-Machine Emergency Responder tools
- Android Devices
- Windows Phone
- Blackberry Devices
- iPad/ iPhone

DOE RAMS (FRMAC)
- DOE Emergency Communications Network (ECN)
- FRMAC Field Teams

Microsoft Azure
Bing Maps
Common Authenticatio n Service

User Accounts
Password/Rules
Event Scope
Rad Responder Lite

- Standard RAMS database hosted in a cloud environment
- GIS services provided via lightweight mapping provider (Bing, Google)
- Easily obtainable, automatically updated client software running on common devices; Apple iPhones and iPad’s, Android powered devices, Windows Phone 7, RIM(Blackberry) devices etc.
- SOA API exposed to authorized external parties; e.g. NRC EPA, NARAC, State and Local responders, Power Plants etc.
- On demand, rapid import mechanism into production NNSA/FRMAC RAMS system
- Common Authentication Mechanism (usernames and passwords)
- Publicly accessible training and support media
Rad Responder Lite Main Site

- Designed for administration functions and event support

- Allows for review of all entered data, including basic Q/A features

- Has a report generation feature similar to RAMS
Rad Responder Lite Thin Client

- Mobile browser optimized site with similar appearance and functionality to mobile app
- Contains a minimum data entry set for acquiring incident specific data
Rad Responder Lite Android/iPhone

• Designed for use by first responders in the initial hours of an event

• Initially rolled out on the Android platform with follow on development for iOS based devices

• Includes all functions available in the internet based thin client

• In addition, allows for offline data entry that can be uploaded to the cloud once the phone acquires either a cellular or wireless internet signal
Policy Considerations

- Who can have an account?
- How will data get shared between member organizations?
- How will Rad Responder Lite work during an actual response?
- How will Rad Responder Lite interact with the core DOE RAMS?
- Will there be any support or training costs?
TYING IT ALL TOGETHER
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Federal, State, Tribal and Local Government Users
Development and Rollout

- Piloting: An ever-increasing cadre over next 1-2 years
  - RAMS and DFM continues evolving for Tier I responders
  - D-DFM being developed and piloted for Tier II with ever-widening pool of pilot testers – more states and the CSTs over the next year
    - MOU with NGB
  - RaaS just began roll out and pilot

- Testing: Years 3-5 will focus on training, drills and spiral development (???)

- Training: Develop web-based training modules and Train-the-Trainer modules
Development and Rollout (2)

• Tier I (FRMAC and RAP) train the Tier 2 (State rad experts); Tier II train Tier III responders in their region
• Develop “event manager” specific training
• Ease of access, e.g., very straightforward so local fire department personnel can complete web training at home
• Obtain FEMA-certification to facilitate state and local personnel using grant funds
Path Forward

– State leadership buy-in: Security & Control concerns
– Engaging the private sector
– Outreach focused on seamless ability to import and integrate data vs. de facto adoption
PANEL DISCUSSION
HANDS ON SESSION