Graduated Rad/Nuc Detector Evaluation and Reporting (GRaDERSM) Program Testing Update

Meeting Focus: ANSI Testing to Meet State and Local User Needs

Presented by:
Caroline Purdy, Ph.D.
Principal Deputy Assistant Director,
Systems Engineering and Evaluation

Cheri Hautala-Bateman, Ph.D.
Test Scientist

November 8, 2010


Website: http://www.dhs.gov/GRaDER
Email: GRaDER.Questions@hq.dhs.gov
      GRaDER.Comments@hq.dhs.gov
      GRaDER.Applications@hq.dhs.gov
GRaDER℠ Process

Graduated Rad/Nuc Detector Evaluation and Reporting (GRaDER℠) Program

Testing

Rad/Nuc Detector Applicant

Accredited Testing Labs*

Results

Test

Standards

Manufacturer Controlled Proprietary Information

Evaluation

DNDO Technical Review and Market Surveillance

GRaDER Evaluated Equipment List

Report Results and Demonstrated Compliance Levels

Compliance Criteria

DNDO Establishes Framework, Provides Information Interpretation

Procurement

Federal, State, local, tribal, territorial Agencies

Federal Acquisition Requirements and Grant Guidance

Customers Gain Information, Confidence and More Effective Detectors

* NVLAP Accreditation
GRaDER<sup>SM</sup> Equipment Categories

- **Category 1** - Alarming Personal Radiation Detectors (PRDs)*
- **Category 2** - Survey Meters
- **Category 3** – Radioactive Isotope Identifiers (RIID’s)*
- **Category 4** - Radiation Portal Monitors (RPM’s)
- **Category 5** - Spectroscopic Radiation Portal Monitors (SRPMs)
- **Category 6** - Mobile and Transportable Systems*

* Indicates equipment categories included in fall 2010 GRaDER<sup>SM</sup> testing
GRaDER℠ Equipment Categories

• **Category 1** - Alarming Personal Radiation Detectors (PRDs)
  ANSI N42.32

  ![Images of PRDs]

• **Category 2** - Survey Meters
  ANSI N42.33

  ![Images of Survey Meters]

• **Category 3** – Radioactive Isotope Identification Devices (RIIDs)
  ANSI N42.34

  ![Images of RIID Devices]
GRaDER℠ Equipment Categories

- **Category 4** - Radiation Portal Monitors (RPM’s)  
  ANSI N42.35

- **Category 5** - Spectroscopic Radiation Portal Monitors  
  ANSI N42.38

- **Category 6** - Mobile and Transportable Systems  
  ANSI N42.43
GRaDER℠ Compliance Levels

• **Level 0** – Equipment has been tested, but:
  – the test results are not available,
  – the test results are being evaluated, or
  – the test results do not meet the minimum subset of the standards as set forth in each category.

• **Level 1** – Equipment meets a *subset* of the applicable ANSI standard performance requirements. Defined at [http://www.dhs.gov/GRaDER](http://www.dhs.gov/GRaDER)
  – *DNDO-selected; focus on radiation detection and other essential elements of standard.*

• **Level 2** – Equipment fully meets the applicable ANSI standard sections.

• **Level 3** – Equipment meets Level 1 or Level 2 and also satisfies the requirements of the applicable technical capability standard (government unique standard).
  – *None approved yet; testing in the future.*
DNDO Objectives for GRaDER$^SM$

• Provide a means to independently test commercially available radiation detection and identification products against standards and report the results.

• Standardize instrument testing and test results reporting to assure valid comparisons.
  
  • *Use of Accepted/Accredited labs using standard reporting protocols and defined Compliance Levels*

• Provide useful information to support radiation detection device acquisition and funding decisions.
  
  • *Established threshold for consideration in Government acquisitions and grants*

• Encourage vendors to develop better radiation detection and identification products.
  
  • *Government unique standards, collaboration with DoD and others.*
Government Cost Share Test Campaign

Why?

- **No manufacturer participation in GRaDER℠**
  - No information for GRaDER℠ Evaluated Equipment List (GEEL).
  - No definitive independent test results for FEMA grant administrators to verify instrument compliance with standards.
  - No independent info source for Responders to make best choices.

- **DNDO Action: One-time, Government 50% cost share for GRaDER℠ testing.**
  - Rapid implementing and reporting.
  - Independent testing, useful differentiation of capabilities.
  - Consistent test execution and reporting.

- **FEMA Action: Establish guidance for required compliance.**
Status

- Special Notice (SN) published May 27, 2010 on [https://www.fbo.gov/](https://www.fbo.gov/).
- 11 June - Manufacturers’ Workshop at NIST, Building 101, Lecture Room B, 9 – 11 am. NIST, DNDO and FEMA presented program and responded to questions.
- 30 June - DNDO Published Q&A results and other clarifications. Published SN #2.
- 2 August - Manufacturers declared intent to DNDO, provided checklist and documentation.
- 17 August - DNDO screened applications, assigned manufacturers’ instruments to appropriate labs, and notified labs and manufacturers.
- Sep/Oct - Manufacturers completing contracts and Test Plans with labs.
- Nov 1 - Mar 11 – Laboratory testing and reporting.
- Feb/Mar 11 – GRaDERSM Evaluated Equipment List established, input for RKB.
Equipment Models to be Tested in 2011 DNDO Conformity Assessments

- 7 Radioactive Isotope Identification Devices (RIID)
- 7 Personal Radiation Detector
- 2 Backpacks

Total: 16 Rad/Nuc technologies
1997-2000: Illicit Trafficking Radiation Assessment Program (ITRAP)

- IAEA suggested a program implemented by Austria, 1997-2000
- Testing conducted in Seibersdorf, Austria in 1998.
  - 14 fix-installed monitoring systems
  - 24 Pocket Type and Handheld Instruments
- Final Report – ITRAP – Illicit Trafficking Radiation Detection Assessment Program. (undated)

2009 EU CBRN Task Force Policy Package had a list of measures to mitigate RN risks

- Certification of Equipment: Standards for performance and testing was on that list.
- In response the EU Sponsored 3 year program, August 2009 – August 2012

2009 – 2012: Illicit Trafficking Radiation Assessment Program+10 (ITRAP+10)

- Testing to parts of Standards (IEC, and ANSI) and to IAEA guidelines.
ITRAP+10: Objectives

• Provide scientific and technical data on COTS RN detection systems to Policy Makers.
• Provide access to the best technology based on repeatable and defensible test procedures and results from equipment testing.
• Promote harmonization of standards (ANSI, IEC) and guidelines (IAEA).
• Improve exchange of information between US, EU, and other entities.
• Provide manufacturers with recommendations to improve performance, reliability and user-friendliness of the equipment.
• Promote new R&D efforts
ITRAP+10: JRC and DNDO Collaboration

January 2010: JRC and DNDO agree to collaborate on ITRAP+10

- EU can only test European products, DNDO agrees to test instruments from any provenance.
- DNDO expands ITRAP to test mobile systems from any provenance.
- Standards are expanded to include both IEC and ANSI standards.
  - Test to most restrictive standards when comparable
  - Test both when not comparable
- Collaborative teams to write the test designs, and to conduct the tests.
- Vendor reports will be provided after test event.
- A joint document will be produced at close of test campaign.
- DNDO published Requests for Information, scheduled to close on 14 December 2010
**ITRAP+10: Labs & Classes of Instruments**

- Testing to be conducted by the JRC at Ispra, Italy and other European Laboratories.
- Testing to be conducted by DNDO at the GRaDERSM Laboratories.

The 9 classes *and corresponding standards*

<table>
<thead>
<tr>
<th>Family of equipment to be tested</th>
<th>Standards Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPM (Radiation Portal Monitors) for Vehicles</td>
<td>IEC 62244</td>
</tr>
<tr>
<td></td>
<td>IAEA NSS1 (2006 &amp; Rev.1)</td>
</tr>
<tr>
<td>SRPM (Spectrometric Radiation Portal Monitors)</td>
<td>IEC 62484-FDIS</td>
</tr>
<tr>
<td></td>
<td>IEC 62244</td>
</tr>
<tr>
<td></td>
<td>IAEA NSS1 (2006 &amp; Rev.1)</td>
</tr>
<tr>
<td>PRD (Personal Radiation Detectors)</td>
<td>IEC 62401-FDIS</td>
</tr>
<tr>
<td></td>
<td>IAEA NSS1 2006</td>
</tr>
<tr>
<td>SPRD (Spectrometric Personal Radiation Detectors)</td>
<td>ANSI N42.48</td>
</tr>
<tr>
<td>RID (Radioisotope IDentifier)</td>
<td>IEC 62327</td>
</tr>
<tr>
<td></td>
<td>IAEA NSS1 (2006 &amp; Rev.1)</td>
</tr>
<tr>
<td>GSD (highly sensitive Gamma Search Detectors)</td>
<td>IEC 62533</td>
</tr>
<tr>
<td>NSD (highly sensitive Neutron Search Detectors)</td>
<td>IEC 62534-FDIS</td>
</tr>
<tr>
<td>PRS (Portable Radiation Scanners – Backpack type)</td>
<td>ANSI N42.43</td>
</tr>
<tr>
<td>Mobile System (DNDO only Testing)</td>
<td>IEC 62327</td>
</tr>
<tr>
<td></td>
<td>IAEA NSS1 Rev.1</td>
</tr>
</tbody>
</table>

*Emphasis of testing is on radiological portion of standards*
Results Information Sharing

GRaDER℠ Evaluated Equipment List
- Starting in February/March 2011, updated as new results are available
- Accessible through the FEMA Responder Knowledge Base (RKB), HSIN

Government funded standards testing - ITRAP+10
- August 2012 Publication of joint JRC/DNDO results – EC and USDHS restricted.
- Government owned and controlled test results. Not a replacement for GRaDER℠.
- Coordinated sharing with FEMA for grants determinations.
- Vendor personalized reports will be provided.