Domestic Nuclear Detection Office (DNDO)

Graduated Rad/Nuc Detector Evaluation and Reporting (GRaDER[SM]) Program Testing Update

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

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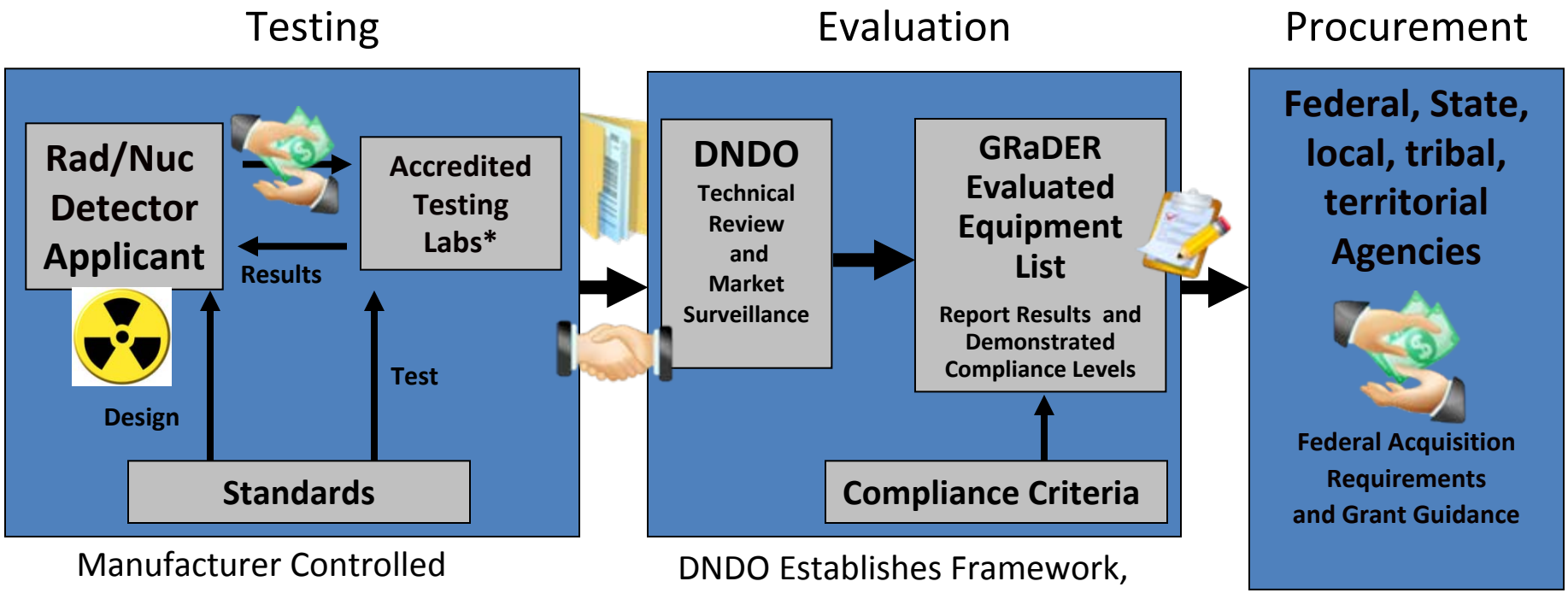
Homeland Security

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

GRaDER^{SM} Process

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



Manufacturer Controlled Proprietary Information

DNDO Establishes Framework, Provides Information Interpretation

Customers Gain Information, Confidence and More Effective Detectors

* NVLAP Accreditation

GRaDER^{SM} 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^{SM} testing

GRaDER^{SM} Equipment Categories

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




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





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




GRaDER^{SM} 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^{SM} 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
  - *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^{SM}**
  - No information for GRaDER^{SM} 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^{SM} 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/.
- 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 – GRaDER^{SM} 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

Other DNDO Programs: ITRAP+10

EU/Joint Research Centre-DNDO

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 GRaDER^{SM} Laboratories.

The 9 classes *and corresponding standards*

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

***Emphasis of testing is on radiological portion of standards**

Results Information Sharing

GRaDER[SM] 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[SM].
- Coordinated sharing with FEMA for grants determinations.
- Vendor personalized reports will be provided.

Homeland Security