



Preventing Illicit Shipments of WMD-Related Commodities

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WCO Framework of Standards and DOE/NNSA



- **WCO Framework of Standards to Secure and Facilitate Global Trade's Customs-to-Customs Pillar, Standard 11 calls for outbound security inspections of high-risk containers and cargo at the reasonable request of the importing country**
- **DOE/NNSA activities on the International Nonproliferation Export Control Program (INECP) support this through:**
 - Commodity Identification Training (CIT)
 - *for strategic (WMD-related) commodities*
 - Portable Metal Analyzers (XRF)
 - *non-intrusive material identification*
 - Electronic Reference Tools (eCIT)

Commodity Identification Training (CIT)

- **Familiarizes** enforcement officers with the materials, components, and equipment sought by WMD procurement programs
 - as listed by the Nuclear Suppliers Group, Australia Group, and Missile Technology Control Regime
- **Reduces the complexity** of the various export control lists, by
 - Grouping commodities by physical appearance and category rather than by function
 - Focusing primarily on appearance, notable features, key parameters, special markings, typical packaging, sizes, weights, monetary values, etc
- DOE/NNSA follows a disciplined train-the-trainer approach, based on our technical partnerships, to establish ongoing, country-led training programs and technical “reach-back” capabilities



Both front-line familiarity and technical reachback key in dual-use interdiction cases

Variations in CIT Implementation

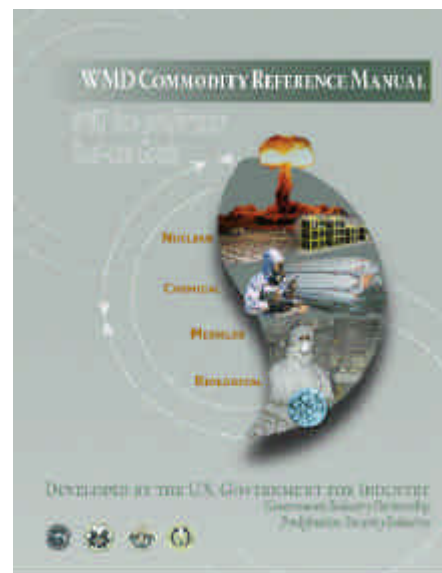
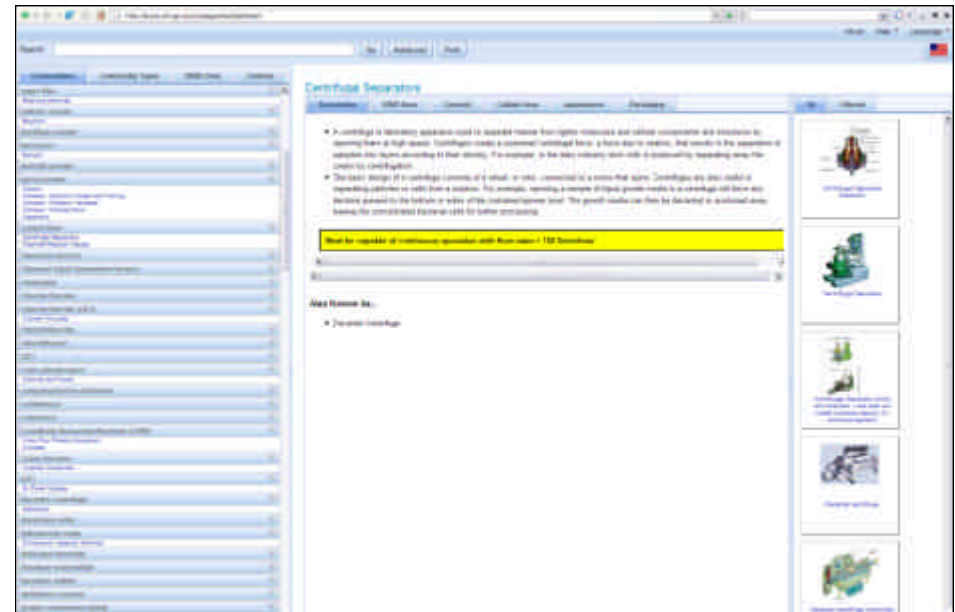
- **Implementing Agencies**
 - Technical
 - Export control enforcement
 - Licensing/regulatory
- **Training objectives and student composition**
 - Target enforcement agencies
 - All inspectors? Specialized units?
- **Type, length, and content of course**
 - Academy or university courses directed at new cadets
 - Centralized, regional, or mobile short courses directed at personnel already in the field
 - Nuclear or WMD; curriculum tailored to regional proliferation threats/issues

BEST PRACTICES and LESSONS LEARNED

- **Curriculum must be appropriately customized**
 - Regional proliferation and transit issues
 - Rich detail on nationally/regionally produced goods
 - National export control laws, customs regulations and procedures
 - Incorporate practical exercises and demonstration items into curriculum development
- **Technical reachback capability must be developed together with inspectional capabilities**
 - Provide online and printed reference materials consistent with training

DOE/NNSA Resources

- Several tools and references are available to facilitate the commodity identification process
 - **XRF**: Portable analyzer for metal/alloy identification through elemental analysis
 - **eCIT/SCORE**: Online, searchable commodity reference for CIT graduates
 - **Reference Materials**: Hardcopy/electronic handbooks, commodity field guides and reference manuals



Controlled Alloy Identification Challenges

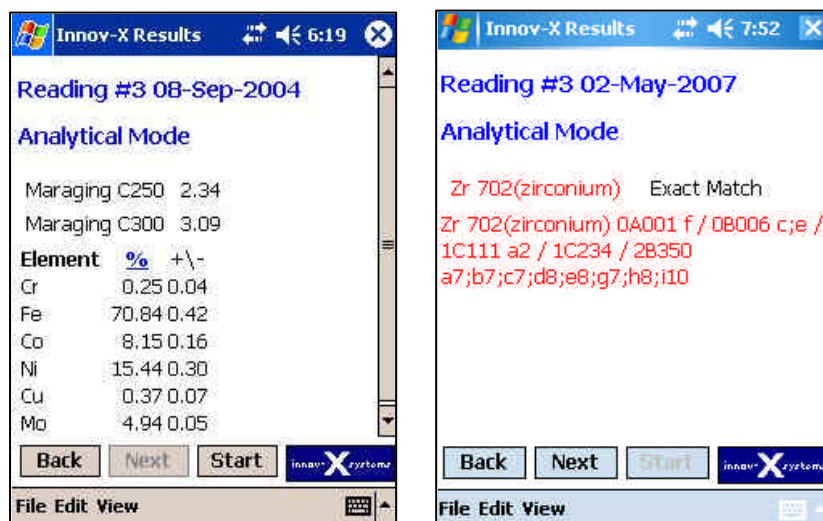
- Metals are, for the most part, visually identical and differentiating controlled metals and metal commodities within an enormous stream of international commerce in base metals and industrial commodities is extremely difficult
- Fast and noninvasive identification and sorting of metal commodities is critical to successful export control implementation



Portable Metal Analyzers

X-ray fluorescence spectroscopy (XRF)

Commercially available, portable XRF metal analyzers can be used to nondestructively and rapidly (10 – 30 seconds) identify elements and alloys, including those potentially controlled by international export control agreements

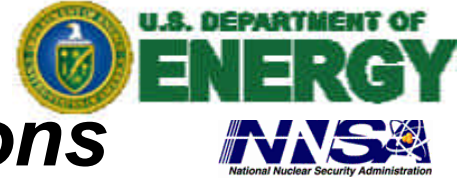


DOE/NNSA ACTIVITIES:

- Enhanced commercial portable metal analyzers to identify nonproliferation related materials
- Modified the instruments to enhance their use for Customs inspectors and investigators
- Developed a training program for Customs inspectors and investigators to enable their use of portable metal analyzers in screening, identification and interdiction of controlled commodities and materials
- Deployed 45 units in 15 countries to date
- Current plans include deployment of a minimum of 8 units in 5 additional countries



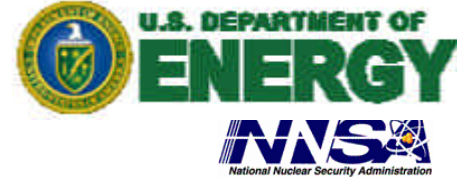
DOE/NNSA Portable Metal Analyzer Customization for Customs Applications



DOE/NNSA made additional modifications to the metal analyzers to support other Customs applications:

- **Added an additional analysis mode to enable identification of trace elements in non-metallic materials including powders, organics, plastics and other materials.**
Applications include:
 - Detection of heavy metal contamination in fish, agricultural produce, plastics and paints
 - Detection of phosphorus to indicate the possible presence of narcotics
- **Added silver, gold, and palladium to Alloy Analysis mode element suite to enable identification of precious metals**

Portable Metal Analyzer Deployment Options



- **Portable metal analyzer deployment options include:**
 - **Full**
 - *DOE/NNSA provides instruments, customized instrument software and operational modes, nonproliferation related alloy libraries, reference materials and training*
 - **Hosted**
 - *Host country purchases instruments and selects operational modes. DOE/NNSA provides customized instrument software, nonproliferation related alloy libraries, reference materials and training*
 - **Libraries**
 - *Host country purchases instruments, selects operational modes and configures the units. DOE/NNSA provides nonproliferation related alloy libraries and reference materials*
 - **Training**
 - *Host country purchases any (possibly non-XRF) portable metal analyzers. DOE/NNSA provides reference materials and training*

eCIT

Electronic knowledgebase of commodity information and controls

- **The Commodity Identification Training (CIT) information and approach has been integrated into an online Strategic Commodity Reference (eCIT)**
- **eCIT provides secure, online full-text search and browsing of the CIT information and all relevant export control lists through a simple user interface**
- **eCIT content includes:**
 - Control Lists
 - *Nuclear Suppliers Group*
 - *Australia Group*
 - *Missile Technology Control Regime*
 - *Wassenaar Arrangement*
 - *EU Dual-Use List (EC 428/2009)*
 - Commodity Information (derived from DOE WMD CIT)
 - Harmonized System (HS) references for strategic commodities

eCIT: 3 panels

contents

commodity

thumbnails

Search:

Commodities	Commodity Types	WMD Uses	Controls
Sugar filter			
Ballistic Missile			
Beryllium			
Beryllium powder			
Bioreactor			
Bismuth			
Bismuth powder			
Boron powder			
Tellurium			
Camera - Electron Shutter And Focusing			
Camera - Radiation Hardened			
Camera - Floating Lens			
Capacitor			
Carbon Filter			
Centrifugal Separator			
Chemical reactor			
Chemical Vapor Deposition Furnace			
Chemostat			
Chlorine fluoride			
Chlorine fluoride (CF3)			
Chloroethane			
Chloroethane			
CF3			
Cold-cathode tubes			
Columns And Towers			
Compensated ion chambers			
Condensers			
Converters			
Coordinate Measuring Machines (CMM)			
Crack Flow Filtration Equipment			
Crookes			
Cryotic mixtures			
Cyano Compounds			
DCO			
DC Power Supplies			
Decanter Centrifuge			
Detectors			
Deuterium oxide			
Dichloroacetic acid			
Dimensional Inspector Machines			
dinitrogen tetraoxide			
Disodium monosulfide			
Disodium sulfide			
Distillation columns			
double containment piping			

Centrifugal Separators

Description	WMD Uses	Controls	Civilian Uses	Appearance	Packaging
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- A centrifuge is laboratory apparatus used to separate heavier from lighter molecules and cellular components and structures by spinning them at high speed. Centrifuges create a sustained centrifugal force, a force due to rotation, that results in the separation of samples into layers according to their density. For example, in the dairy industry skim milk is produced by separating away the cream by centrifugation.
- The basic design of a centrifuge consists of a wheel, or rotor, connected to a motor that spins. Centrifuges are also useful in separating particles or cells from a solution. For example, spinning a sample of liquid growth media in a centrifuge will force any bacteria present to the bottom or sides of the container/spinner bowl. The growth media can then be decanted or suctioned away, leaving the concentrated bacterial cells for further processing.

Must be capable of continuous operation with flow rates > 100 liters/hour

Also Known As...

- Decanter Centrifuge

Centrifugal Separator schematic

Centrifugal Separator

Centrifugal Separator photo and schematic - note inlet and outlet indicating capacity for continuous operation

Decanter centrifuge

Decanter centrifuge schematic

eCIT Deployment

- **The system is designed to be easily customizable and adoptable by interested countries**
 - Built with open source software development tools and server software
 - Multi-lingual support
 - Includes Content Manager application to facilitate the importation and maintenance of translated and national control lists and commodity data
- **Deployment modes include**
 - **User**
 - *Partners can access our system online*
 - **Hosted**
 - *Partners can use our platform to host their own version, in their own language*
 - *Requires content management, but no software/database development or system administration*
 - **Installed**
 - *Partners can install the system on their own servers and modify/adapt as desired*

Points of Contact

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Strengthening Global Efforts

ON NONPROLIFERATION EXPORT CONTROLS



XRF METAL ANALYZER

- Quick, in the field, non-destructive elemental and alloy analysis.
- Commercial off-the-shelf technology
- In-field identification of most metals controlled under the WMD nonproliferation regimes
- Display of alloy information as well as related controls
- Useful for customs applications like manifest verification, precious metal identification, RoHS/WEEE compliance



PROGRAM OVERVIEW



MISSION
The mission of the International Nonproliferation Export Control Program (INECP) is to strengthen global efforts to prevent proliferation of WMD-related materials, equipment, and technology.

PURPOSE
Enable partner countries to detect and prevent illicit WMD-related commodity transfers.

AREAS OF ENGAGEMENT

- WMD-related Commodity Identification Training (CIT) and reach-back for Customs
- Proliferation Risk Analysis in the Licensing Process
- Government Outreach and Enterprise Compliance

eCIT SEARCHABLE COMMODITY DIRECTORY

- Directory of WMD-related commodity information and controls.
- Internet-based.
- Content includes control lists and information from INECP's Commodity Identification Training
- Simple and advanced search capabilities
- Specialized and ad-hoc reports
- Support for multiple control Lists
- Available for Customs use, or for adoption and customization, including multilingual support



