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FILTR: Flash Isotope Library and Training Resource

D. Campbell, D. Trombino

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FILTR: Flash Isotope Library and Training Resource

By
David Campbell, David Trombino
CounterMeasures Test Beds
Infrastructure and Force Protection Division
Nonproliferation, Homeland and International Security Directorate
Lawrence Livermore National Laboratory
Livermore, CA 94551

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INTRODUCTION

The subject of radiation detection is replete with complex concepts and challenging nomenclature. Furthermore, a daunting variety of radioactive isotopes may be encountered during the routine operation of a radiation detector. Individuals tasked with searching for illicit sources of radiation must remain vigilant while navigating through more frequently encountered mundane and legitimate radioactive sources. The Flash Isotope Library and Training Resource (FILTR) is being developed as an easily accessible and intuitive reference tool to manage the high volume of complex information required for this task.

FILTR is an extended version of the Primary Utility for Nuclear Terminology (PUNT) software developed by the CounterMeasures Test Beds group at Lawrence Livermore National Laboratory for the United States Secret Service. Authored in the Flash multimedia development environment, FILTR contains detailed information on potentially encountered isotopes as well as training on radiation and operational procedures. Reference material is organized to present critical information quickly while facilitating more in-depth investigation through an intuitive interface and engaging content. FILTR is being developed for a diverse audience of law enforcement organizations and government agencies and a wide range of skill sets from expert analysts to officers whose primary role is not radiation detection. Additionally, the wide compatibility of Flash content will allow FILTR to be readily accessible through the growing number of multi-media enabled electronic devices, including PDAs and cellular phones.

CONTENT

FILTR leverages the full power of multimedia to present relevant information in an engaging and timely manner. Features such as images, audio, video, and interactivity allow content authors to communicate with end-users and convey complex ideas in a clear and easily understood manner. Additionally, FILTR content is arranged in a hierarchy where critical information is immediately available on default displays and additional details are easily accessible (see following figures). Three major categories of content are under development:

Isotope Reference Library

This library contains a list of isotopes which may be encountered by users. Critical information such as classification (NORM, SNM, Industrial, or Medical), known uses, and types of radiation emitted (gamma and/or neutron) is provided for each entry. Additional features include known manufacturers, relevant images (such as devices which may contain the isotope) and energy spectra.

Training Reference Library

This library is intended as readily accessible refresher training on relevant topics. Each topic is contained in an individual module. Core topics include radiation fundamentals and the principals of radiation detection. More advanced topics include biological effects of radiation and an overview of legitimate radioactive shipping trends and procedures.

Operational Reference Library

This library contains agency specific reference material. Example modules include interactive user manuals for specific hardware, concepts of operation, and procedural guidelines.

DESIGN

Due to the importance of the mission and the diversity of the end-user community FILTR has been designed to be both robust and adaptable. These qualities have been achieved with a modular structure and a common graphical user interface (GUI) which assesses available material each time the application is launched. Reference modules consist of compiled flash content (".swf" files) located in contextual subdirectories. When activated, FILTR performs a quick inventory and allows access only to content that is available at that time. This strategy allows old modules to be replaced and new modules to be added simply by dropping new files into the appropriate folders. The self-contained nature of each module combined with the adaptable nature of the GUI makes FILTR robust by minimizing the likelihood of "broken links" to missing or renamed content.

Furthermore, individual modules can be rapidly accessed by external software through embedded hyperlinks. For example, detector operators can access isotope specific FILTR modules by "clicking" the name of the isotope which has been identified. The addition of this functionality requires no additional effort from LLNL or the detector operator. All that is required is for vendors to embed hyperlinks which follow a standard file naming convention. FILTR is designed to be widely compatible and inclusive of the diverse vender community.

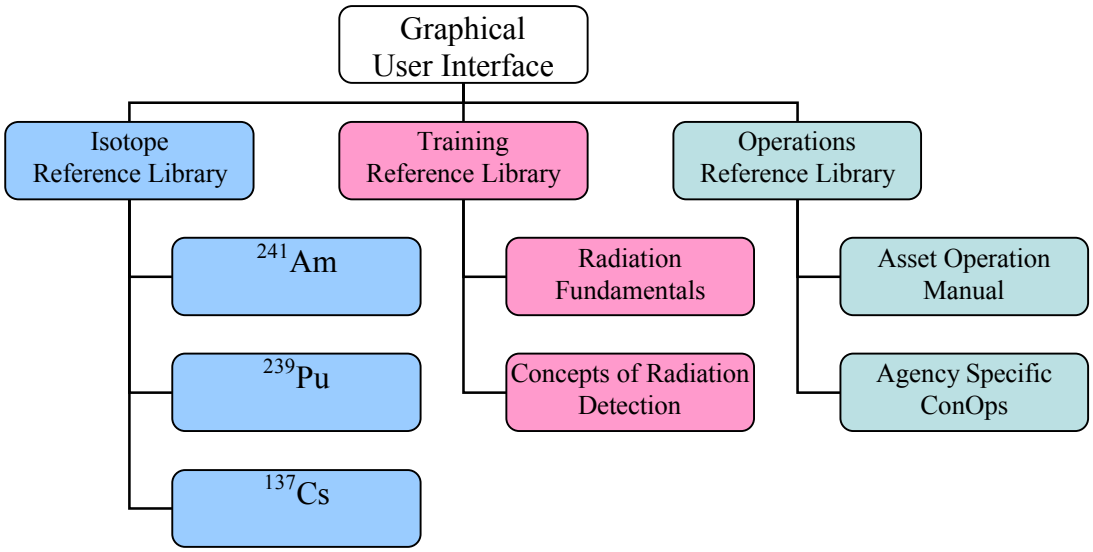

Figure 1: A schematic of the organizational structure of FILTR.

CONCLUSION

A reference tool is required to manage the high volume of complex information relevant for effective radiation surveillance. FILTR was designed to address this need by allowing rapid access to critical information through intuitive navigation and engaging content. Designed with field operations in mind, FILTR can be easily accessible through its compatibility with numerous platforms from computers to cell phones and PDAs. Furthermore, FILTR can be inexpensively maintained and modified as new threats emerge or end-users desire new or specialized features.

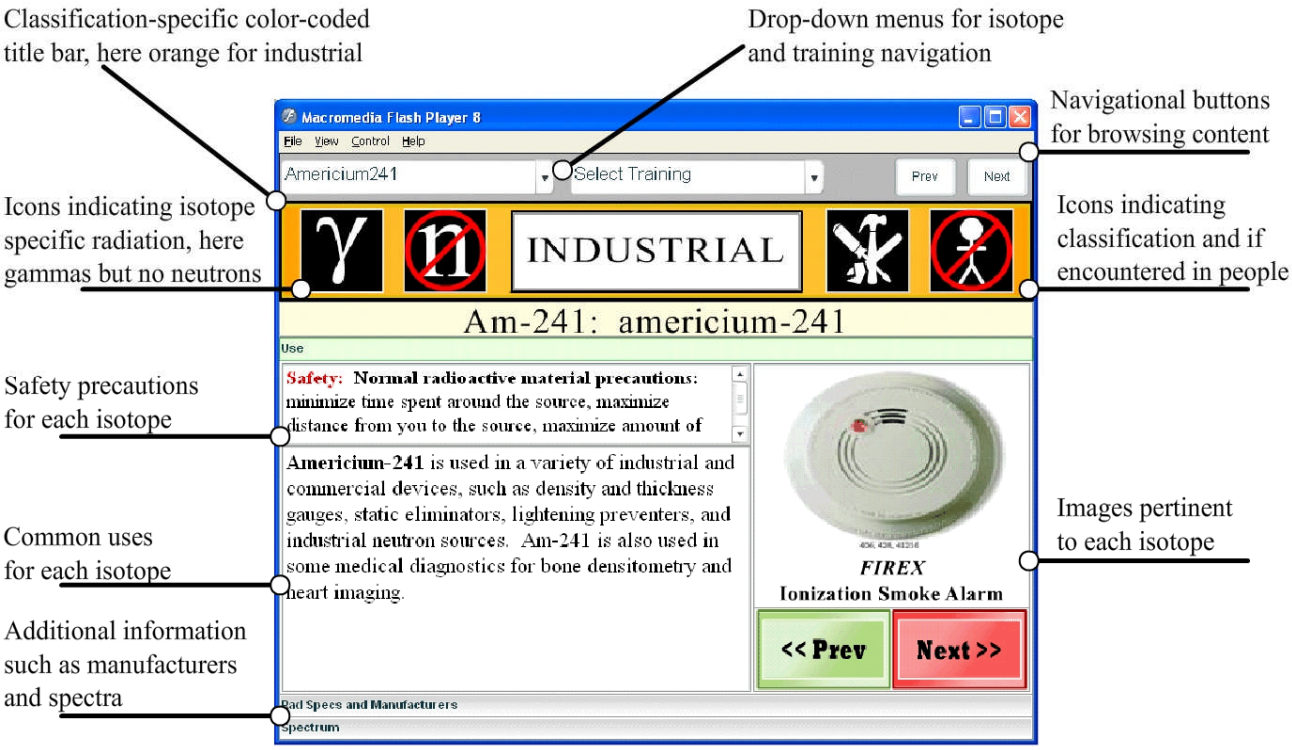

Figure 2: A screenshot from the ^{241}Am reference module with key features highlighted.

Figure 3: Two screenshots from commonly encountered sources. The title bar contains vital information in a readily understandable format to facilitate timely action when necessary.

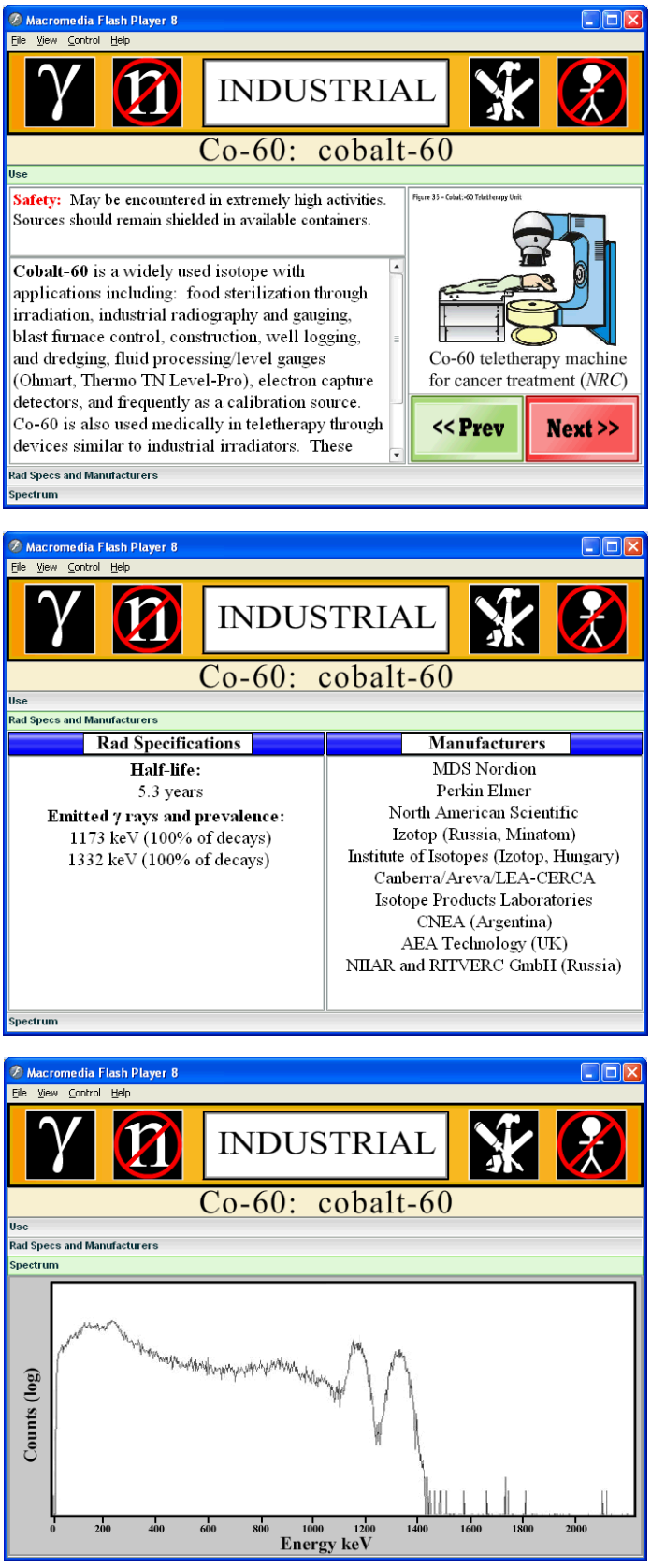

Figure 4: Screenshots from the ^{60}Co reference module demonstrating the additional content available for each isotope.

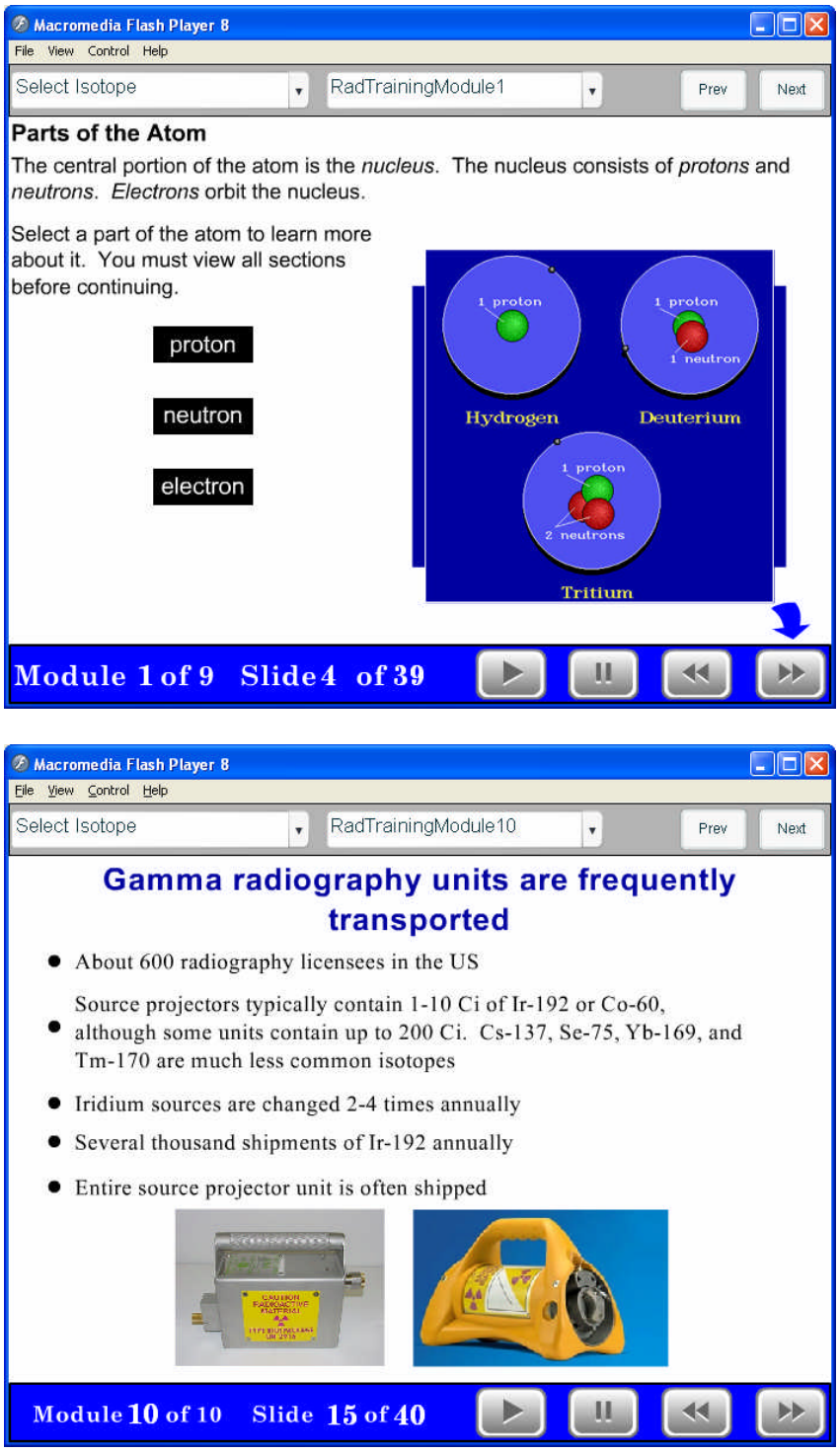

Figure 5: Screenshots from training modules on radiation fundamentals (top) and commonly encountered radioactive sources (bottom). The slide shown in the top panel contains interactive content as well as video clips detailing the building blocks of atoms.