Figure 1. LVis Main Screen. Three Detectors Shown.

- **Streamlines Counting Laboratory operation**
- **Administrator and operator modes**
- **Detector and Sample user focus**
- **Easy installation and easily learned**
- **All data in one place ".LVM" data files**
- **Configurable auto file name generation**
- **Advanced peak editor**
- **Comprehensive Quality Assurance**
- **Custom Report generation from Access database files**
- **Detector Simulation mode**

LVis from ORTEC is an application manager software package designed to simplify the routine operation of ORTEC GammaVision-32 within a busy counting laboratory environment. All of the powerful features of the widely-used GammaVision-32 analysis package are still available, but routine sample counting operations are greatly simplified. In addition, a number of new or enhanced features are added. It is assumed that the reader is familiar with the features of GammaVision, an overview is provided in the GammaVision-32 brochure available for download from www.ortec-online.com.

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The LVis Approach to Sample Management: Clear and Logical

The configuration sidebar to the left of the main screen (Figure 1), illustrates the "hierarchical" approach of LVis, in which the focus is on detectors then sample types as opposed to the standard GammaVision GUI which tends to be "spectrum-focused." In the sidebar, each configured detector is listed in order (four are shown in Figure 1); the two "red detectors" are counting. Pre-defined sample types are associated with each detector through "parameter sets" which guide the appropriate sample acquisition-analysis-report sequence on the chosen detector. In principle an unlimited number of detectors can be managed in this way, although in practice eight might be considered a realistic maximum for a single PC work station. (Multiple networked work stations can control different groupings of detectors essentially without limit.) The sample type parameter sets allow an administrator or supervisor to: PREDEFINE fixed parameters (an example might be acquisition time), REQUIRE certain operator responses, such as sample weight or origin, and ALLOW optional operator entries such as textual comments.

A Typical Routine Analysis Under the LVis Application Manager

What follows illustrates how an operator would carry out the simplest routine sample sequence on a system which has already been set up by an administrator. (The operator must first log onto the system through a password before gaining access to any system functions.)

Step one: Choose the Detector to be used and the Sample Type to be counted on that Detector. (Here, a marinelli sample is chosen to be analyzed on detector 1.)
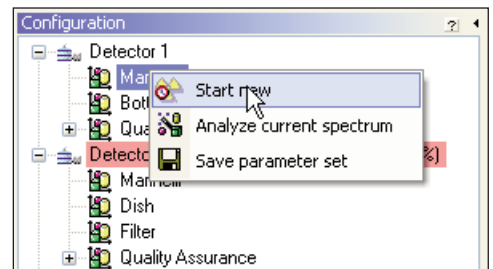

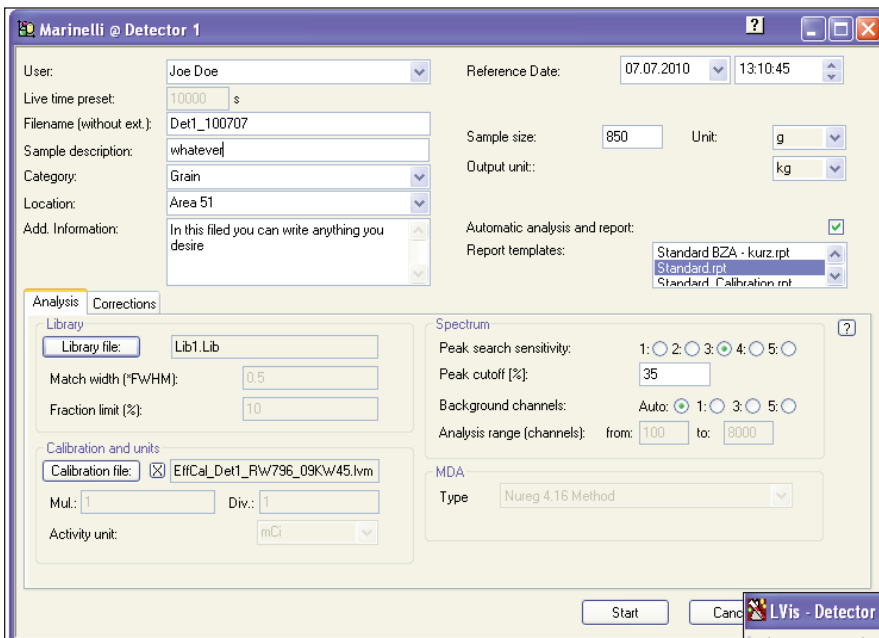Figure 2. Step 1. Starting a Sample Measurement.

Figure 3. Step 2. Parameter Review and Starting Sample Acquisition.

Step two: The sample parameters window appears. Here the operator may review all parameters and change those which have been "authorized" as changeable at administrator level. Assuming the operator is satisfied with the parameters on view, he or she then clicks on "start," and the sequence proceeds.
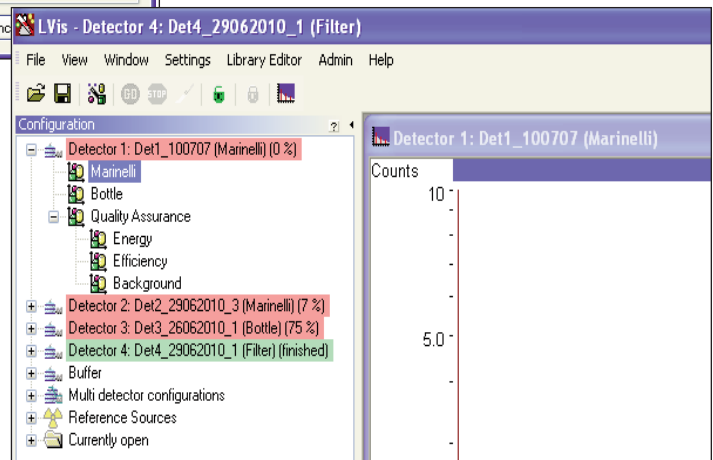
Step three: As soon as the acquisition starts, the live display (shown partially in Figure 4) appears. The active detector in the configuration window is highlighted in red and labelled with the filename, applied parameter set, and percent of the preset acquisition time which has elapsed. The highly flexible file naming convention is described in detail later in this brochure.

Figure 4. Step 3. Start of Acquisition.

Step four: The analysis proceeds to completion and a report is produced as a .PDF file if desired. . . It can really be that simple!

Multi-Detector Acquisition Configurations

In addition to the support of independent acquisitions on multiple detectors as described above, LVis also supports multi-detector acquisitions which are associated with each other. In some measurement situations, it is desirable to automate the control of simultaneous acquisitions on multiple detectors in which they are all measuring the same sample. (An example is whole-body counting.) In this case, sample description information is common to all detectors, but calibration data are not. This capability is built into LVis.

The Role of the LVis Administrator

The LVis administrator function, which has its own access password, controls how the analysis proceeds through the ability to predefine, require entry of, or allow changes to sample parameters by the operator. In order to make the set up of the system and of the various sample parameter sets to be used, the various settings and parameters accessible to the administrator are grouped logically:
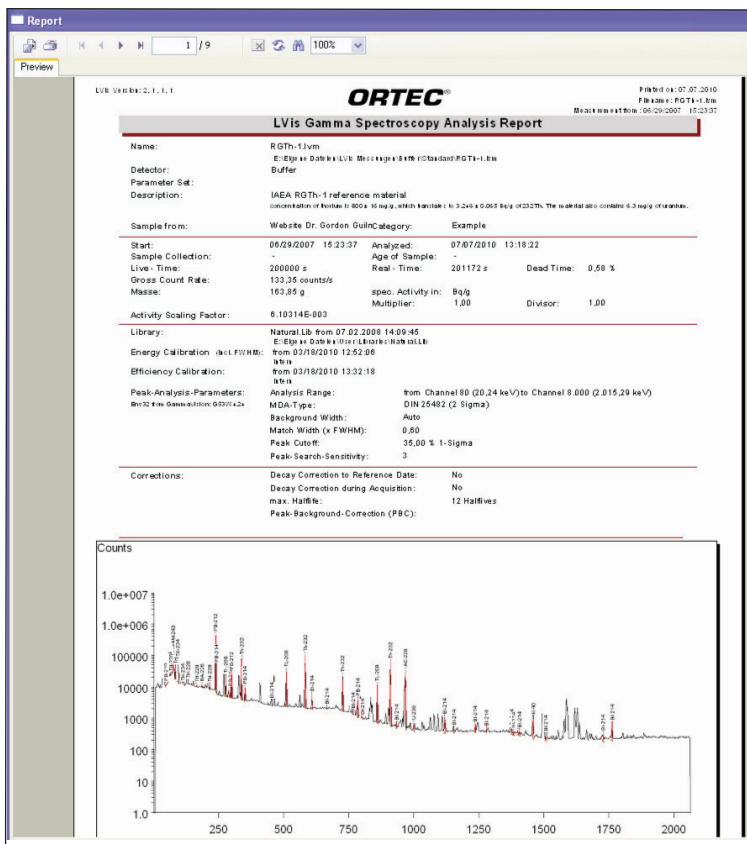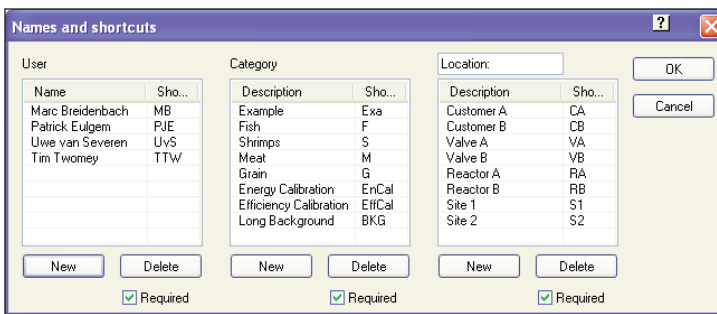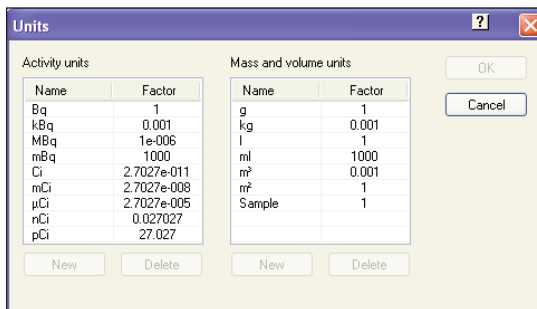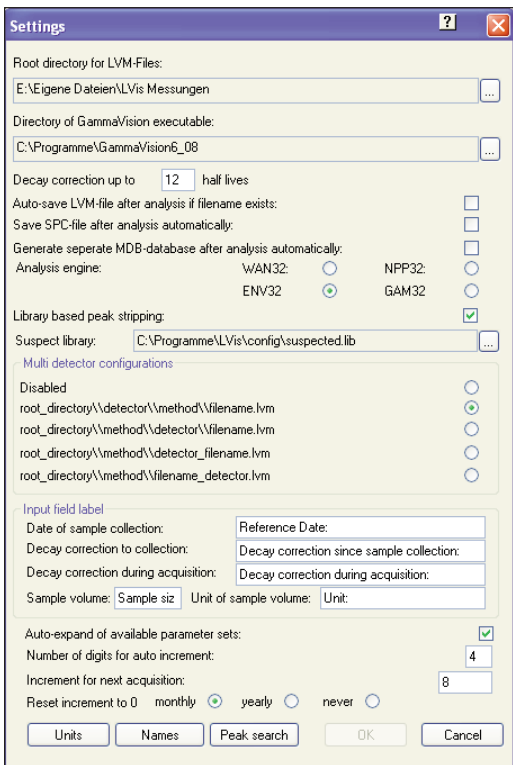

Figure 5. Step 4. The Report.

Figure 6. System Settings, Including "Units" and "Name" Settings.

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Global or "System Settings": Set and Forget

The Global or System Settings (Figure 6), under administrator control, apply to the system as a whole and relate to the operational preferences of the laboratory itself. They apply to every sample. Activity and mass/volume units can be defined as well as a set of "Names": User, Category and a third definable classification (shown above as "location," but which equally could be "customer name" etc.). These can be defined as mandatory selections for the operator and appear on the output report.

Detector/Sample Parameters: Flexibly Powerful

These parameters are set by the Administrator, and define the analysis process and operator interactions when a sample is chosen to be run on a specific detector.

Each parameter can be set by the administrator as "locked" or "unlocked" as defined by the red and green symbols in Figure 7. The values on the fields are the default values which will be seen by the operator as fixed or editable according to the choice of the adminstrator. This is a POWERFUL means of making LVis closely conform to laboratory operational practice.

LVM Files

An important aspect of the LVis design is the use of the ".LVM" or "LVis Measurement" files.The LVM file is a comprehensive record of a complete sample measurement in binary format, which therefore may be used for archival purposes. All internal data can be easily exported from an LVM file to the standard GammaVision file if required.

The internal (binary) information in an LVM file can be automatically exported to an Access® database. By activating this feature in the LVis settings, an mdb database is created for each LVM file in the same directory once it is saved. This database can then be used in conjunction with such systems as laboratory information management systems (LIMS).

The LVM File can be Reanalyzed at Any Time

When an LVM file of a previous sample is opened, all the data in the file are presented in a highly informative, logical form where all data are easily located through a series of Windows tabs.

The report is easily regenerated through a "print" button on the analysis page.
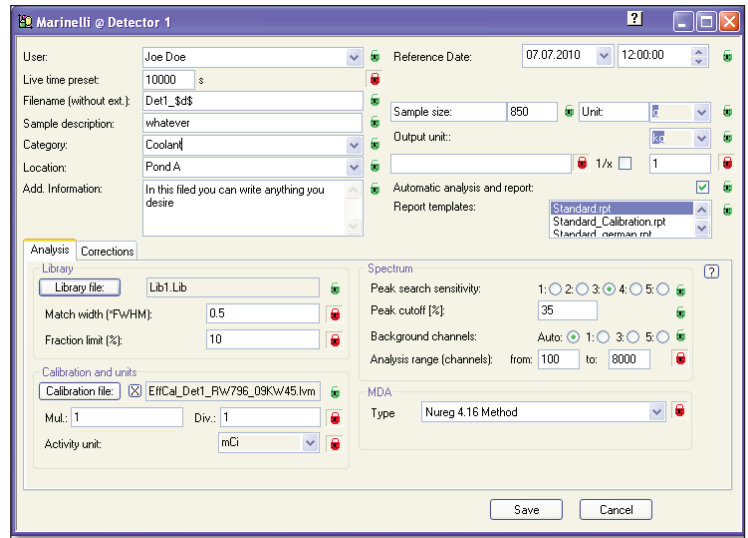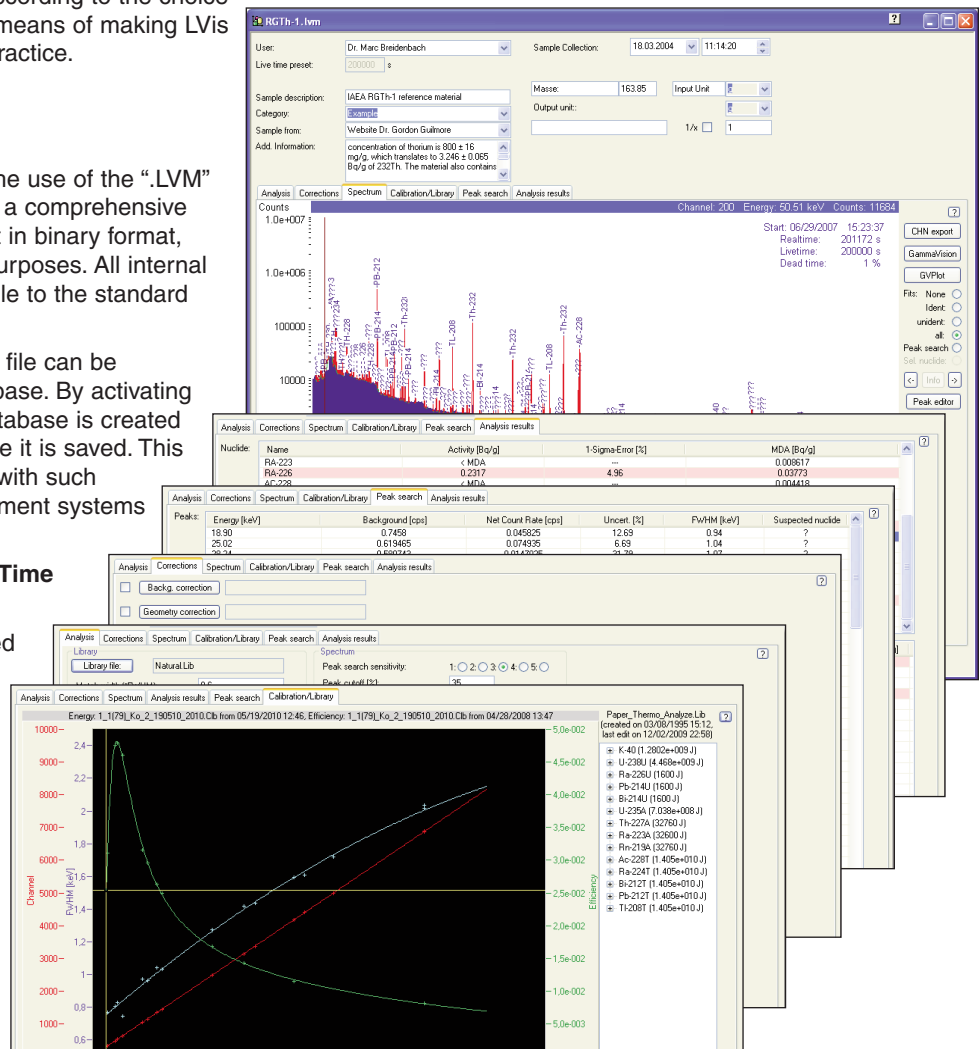

Figure 7. Administrator Parameter Settings.

Figure 8. LVM File Tabs.

LVis Report Generation: Standard or Customized

LVis reports are generated through the use of Crystal Reports® templates. Standard templates for reporting of results, library, calibration and quality assurance are included. It is possible to compose report formats specific to the requirements of the counting laboratory via the use of the Crystal Reports product itself. Currently Crystal Reports XI is required to generate customized LVis reports.

Interactive Peak Editor

A powerful interactive peak editor is accessible through the "spectrum" tab of the LVM file (Figure 9). Its purpose is to assist in diagnostics by allowing trial adjustment of peak data relating to the peak search phase of the analysis such as energy centroid, peak background integration limits and peak width. It may also be used to manually adjust peak fit data during the calibration process to ensure the best possible calibrations.

Powerful Automated File Naming and Sequencing

In a busy counting laboratory, logical sample management is key to success. Through the use of a very powerful "dollar command" ($) feature, LVis can automatically generate file names which include character strings to represent:

- Current date and time
- Sampling date and time
- Incrementing sequence number
- Abbreviated user name
- Abbreviated sample category
- Administrator-defined name (location in Figure 6)
- Sample parameter set name

For example: defining the file name using a parameter set by the $ command string d_i would result in file names starting with 080307_0001 on March 7th 2008 and beginning with sample 1. This powerful feature alone greatly simplifies and rationalizes the storage of data, and aids in overall data management.

LVis Calibration

LVis uses the GammaVision calibration "engines" to perform the energy and shape calibration based on source certificate files which are accessible directly from the reference source icons located in the configurations sidebar (Figure 1). The patented GammaVision automatic energy calibration feature is available through LVis. The peaks proposed to be used for the calibration may be examined and the fit "fine-tuned" in order to achieve the best possible result through the use of the interactive peak editor. New calibrations are automatically associated with the detector for which they were performed, and the highly automated process is driven by the use of detector and sample specific calibration parameter files.
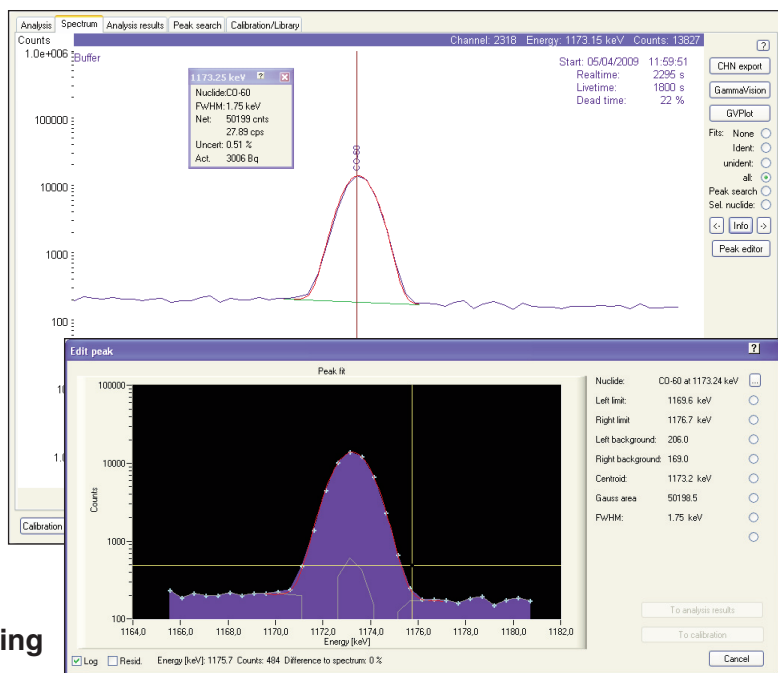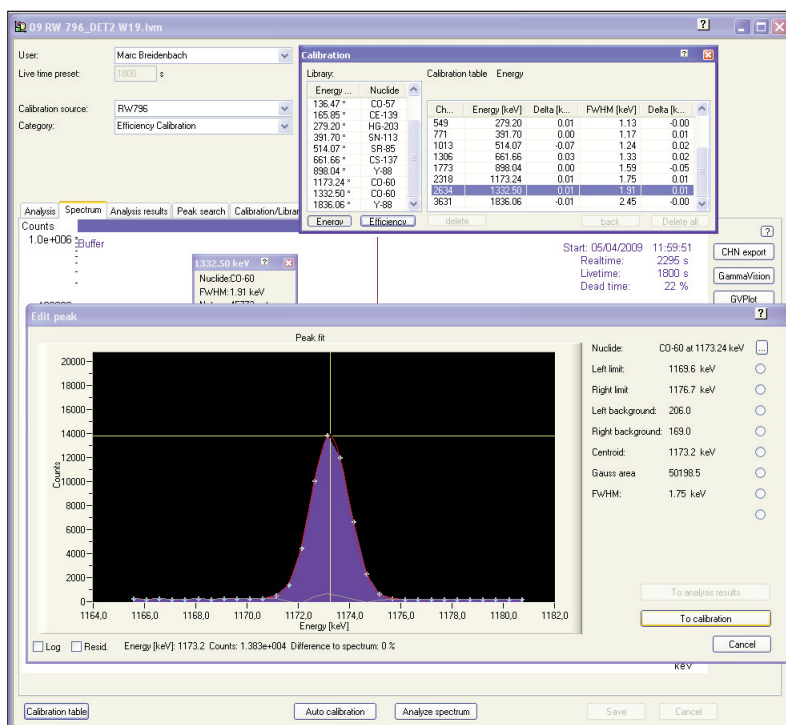

Figure 9. Interactive Peak Editor.

Figure 10. Using the Peak Editor to Refine the Energy Calibration.

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When both energy and efficiency calibration are complete, a convenient single display of energy, FWHM and efficiency calibration curves is provided.

Quality Assurance within LVis

Naturally, Quality Assurance (QA) is important in any piece of software destined for use in a counting laboratory. LVis provides the following quality assurance monitoring:

Energy check: Compares the identified peaks with the library (peak energy) and calibration (FWHM) data. The result for each individual peak is stored in the QA database.

Efficiency check: The activity of three different nuclides is specified (at a reference date) and compared to the identified activity during the efficiency check. The results for the three different nuclides are saved in the QA database.

Background check: Count rate or nuclides in the background spectrum. The latter mode can automatically update related detector parameter sets.

The administrator can define the frequency at which QA measurements must be taken via a settings dialog (Figure 12).

The QA measurements are detector specific as can be seen in the configuration menu sidebar in Figures 1 and 13. Under administrator control, a detector may be "locked out" should the operator not perform the required QA measurement in a timely fashion or if one or more parameters are found to be outside the limits. In the case of an out-of-limits result an "!" symbol marks the detector and an "info" provides the explanation.

Quality assurance reports may be easily extracted between specified dates in support of a laboratory quality accreditation program.
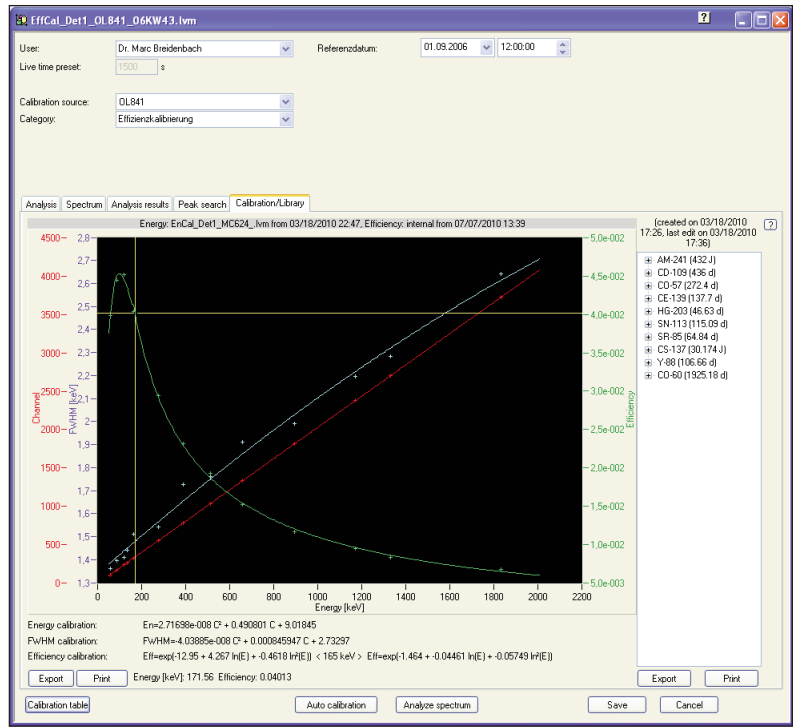

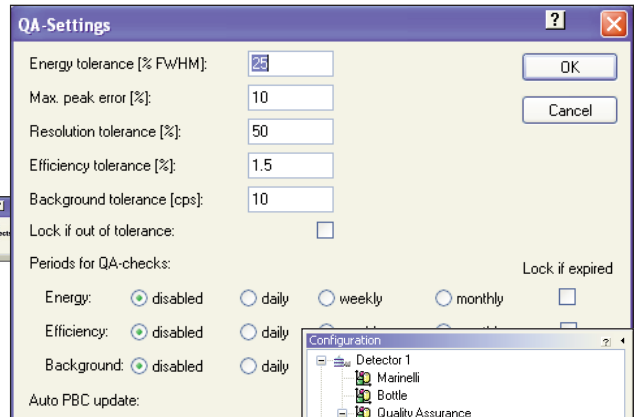Figure 11. Completed Calibration.

Figure 12a. QA Settings.

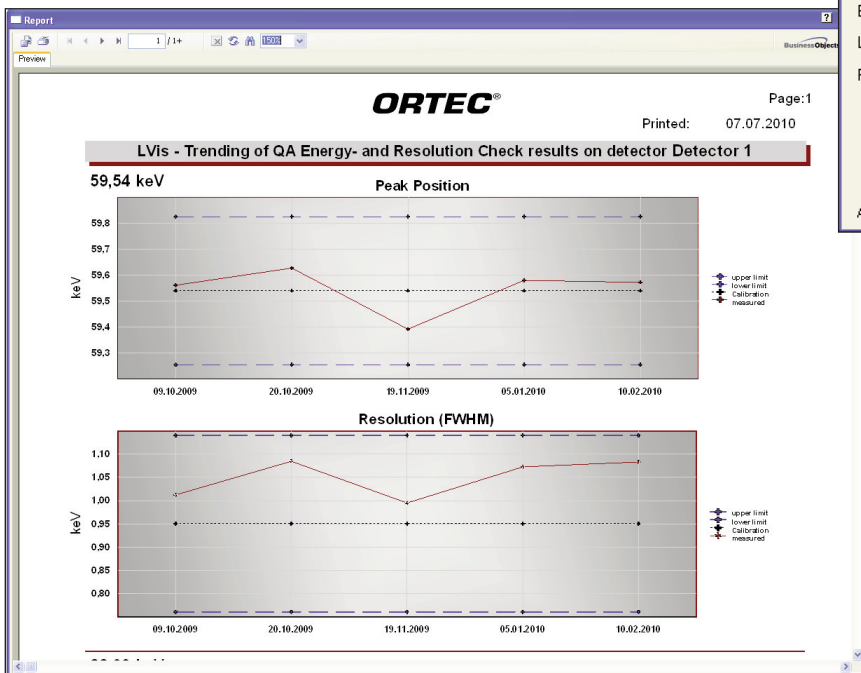Figure 12b. Start Detector QA Measurement.
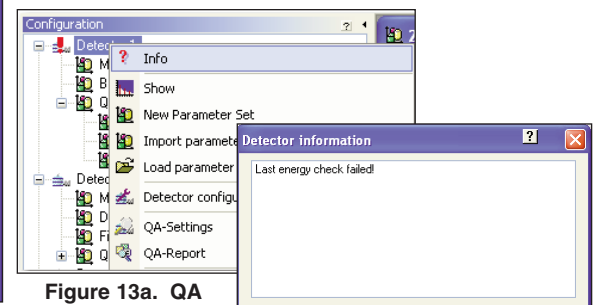

Figure 14. Quality Assurance Report.

Figure 13a. QA Out of Limits.

Figure 13b. Detetor Info.

Getting to know LVis: The Detector Simulator

A counting laboratory is a busy place and "detector time" is usually at a premium in order to maximize sample throughput and revenue in the case of a commercial counting lab. The provision of a detector simulation mode means that operators may train on the use of LVis offline from the day-to-day "real" counting operations in the lab. The simulated detector and all functions associated with it behave just like the actual detectors, but instead of actual detector hardware the user is asked to nominate a stored spectrum, which is then used to simulate the live display, counting to a preset time in the usual way.

Ordering Information

Model	Description
LVIS-B32	LVis Counting Laboratory Application Manager Software (Single user copy or first network copy). Includes documentation and Binary Use License (BUL). Requires licensed copy of A66-B32 GammaVision-32 V 6.08 or later.
LVIS-A66-B32	Includes LVIS-B32 and latest version of A66-B32 GammaVision-32 software.
LVIS-A66-K32	Inlcudes LVIS-B32 and upgrade of existing A66-B32 GammaVision-32 to latest version.
LVIS-U32	Upgrade of LVIS-B32 to latest version. Requires BUL from existing version of LVis.
LVis-N32	Additional Network Copy of LVIS-B32. Includes BUL, disks, and documentation. Requires previous purchase of LVIS-B32.

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