

APPLICATIONS OF TRIGGERED AND/OR CONTINUOUS AUTONOMOUS GAMMA SPECTRAL ACQUISITION AND ANALYSIS SYSTEMS

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ABSTRACT

Many facilities or laboratories have spectroscopic measurement instruments with only a few sample types and where it is desired to start the acquisition and assay remotely, or where it is desired to have a minimally trained operator insert the sample and start the assay; i.e. a *triggered* assay. Examples are a laboratory gamma spectroscopy system set up for back-shift assays of a few important sample types, or for a field sample assay system. There are also other scenarios requiring a repeating sequence of gamma spectral assays on the same sample; i.e. a *continuous* assay. Examples here include effluent monitoring systems or neutron activation analysis assays.

This presentation will describe both of these applications, and how they are accomplished with the Mirion Data Analyst. The Data Analyst [DA] is a device that connects to CZT, Scintillation or HPGe gamma detectors and their respective Multi Channel Analyzers. The DA is an autonomous device that can be set up to operate in the Continuous mode, the Triggered mode, or both of them simultaneously. Upon application of power, the device starts up acquiring the Continuous sequence, or awaiting the input for the next Triggered assay. After each acquisition time is finished the spectra is analyzed within the DA using an embedded version of the standard Genie2000 algorithms, and tested for alarms if appropriate for that application.

Examples to be presented include:

- Primary coolant at Nuclear Power Plant using a collimated CZT detector aimed at a pipe.
- Primary coolant at Nuclear Power Plant using a shielded HPGe system that will measuring an extracted primary coolant sample.
- Stack Gas Monitor with a shielded HPGe detector viewing a large Marinelli gas beaker at 4 different reactor sites.
- Fuel Rod Scanner with a heavily collimated HPGe detector viewing a 0.5mm wide section of the incrementally scanned fuel rod.
- Robotic measurements of ground and floor activity where the robot autonomously drives a predetermined pathway and the two NaI detectors each generate nuclide results every 3 seconds.
- Laboratory HPGe detector used for Neutron Activation Analysis performing continuous simultaneous short and long count time count-time continuous assays as the sample decays.
- Field Sample Assay system with a CZT detector for push-button assays of filter paper and charcoal air samples