in cooperation with

MIRION TECHNOLOGIES

RESEARCH PROJECT **ASGS**

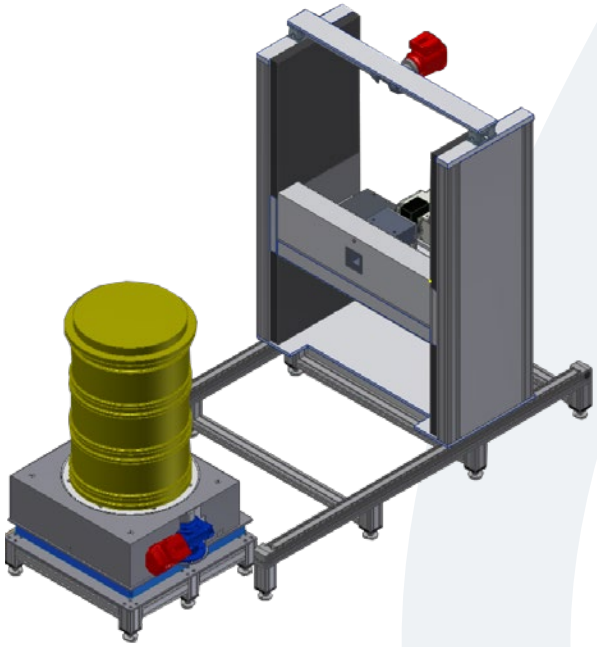
ADVANCED **S**ECTORIAL **G**AMMA **S**CANNING

OBJECTIVE

AiNT and Mirion Technologies (Canberra) are jointly developing a waste drum measurement system called “Advanced Sectorial Gamma Scanning” (ASGS) for the characterization of radioactive waste. The innovative measurement and analysis method is capable of reconstructing the radionuclide activity within the drum with spatial resolution. In combination with the analysis software “ECIAD” (Efficiency Calculation for Inhomognious Activity Distributions), the measurement uncertainty can be significantly reduced compared to Segmented Gamma Scanning (SGS) without compromising on measurement time.

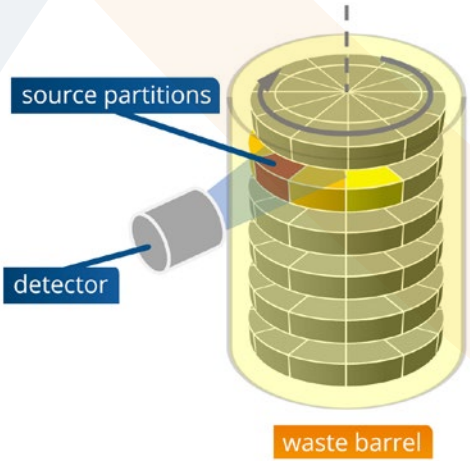
BACKGROUND

The safe management requires adherence to strict regulations during the conditioning, packaging and characterization of radioactive waste. The non-destructive assay by measuring the gamma-emitting isotopes has proven to be an efficient method in determining the radioactive inventory of waste with respect to dose uptake, time and cost. The method of SGS has been applied for decades, however, the technique relies on simplifying assumptions. These result in higher measurement uncertainties which in consequence leads to a declaration of high ‘virtual activity’ of conservative estimates.



INNOVATION OF THE METHOD

The newly developed ASGS method provides all the advantages of conventional Gamma Scanning, but additionally exploits the spatial information on the emitted gamma radiation obtained during the measurement. The spatial distribution of the activity within the waste drum is not fully known a priori. With the new “ECIAD” software the radioactive inventory is reconstructed with spatial resolution. This way, ASGS allows to significantly reduce the conservative estimate for the declared activity.



FEATURES

- Measurement of non-homogeneously distributed activity inventories
- Determination of nuclide-specific activity with lower measurement uncertainty than in SGS
- Reduced virtual activities in the waste declaration
- Uncertainty calculation according to DIN ISO 11929
- High dynamic range for activity contents
- High throughput due to large collimator aperture-opening
- Adaptable to varying waste drum sizes

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