Influence of Detector Resolution on the Occurrence of False Alarms of Radioactive Wastewater Monitors

Robert Hinca[1, a)] and Branislav Stribrnsky[1, b)]

[1]*Institute of Nuclear and Physical Engineering, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology in Bratislava STU, Ilkovicova 3, 812 19 Bratislava, Slovakia*

[a)] Corresponding author: robert.hinca@stuba.sk
[b)]branislav.stribrnsky@stuba.sk

Abstract. This paper deals with the analysis of the influence of detector resolution on the occurrence of unwanted false alarms caused by natural radiation. A comparison of two compatible scintillation detectors with the same size: 2″ × 2″ NaI (Tl) and 2″ × 2″ $LaBr_3$(Ce) is given. The main difference between the detectors is in the resolution, which is about 3 times better for $LaBr_3$(Ce). The work demonstrates a significant impact of using a spectrometric mode of analyzer linked with a good resolution detector. In conclusion a particular analysis of the natural Bi-214 signal proportion in the Cs-137 discriminator windows shows negligible amount of crosstalk for detector resolution below 3.5%.