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## Method validation approach for environmental radioactivity measurements

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The present paper describes the experience of Kuwait Institute for Scientific Research (KISR) in relation to implementing the validation procedures of nuclear analytical test methods applied in the Radioactivity Measurements Laboratory (RML). The test methods include both destructive and non-destructive analysis of environmental samples using alpha and gamma spectrometry. These are: (a) gamma emitters in the marine sediment using ultra low gamma spectrometry, (b) determination of  $^{210}\text{Pb}$ ,  $^7\text{Be}$ ,  $^{137}\text{Cs}$  and  $^{40}\text{K}$  in dust fallout samples using well type gamma spectrometry, (c) determination of  $^{137}\text{Cs}$  concentration in high volume seawater samples by AMP co-precipitation method and ultra low background gamma spectrometry, (d) determination of  $^{226}\text{Ra}$  in drinking water by  $\text{MnO}_2$  co-precipitation method and well type gamma spectrometry, (e) uranium and plutonium determination in marine sediment by radiochemistry and alpha spectrometry. The internal method validation parameters (Minimum Detection Limit, accuracy, relative error and marginal recovery of the radiochemistry test methods were estimated) were estimated based on EUROCHM guide criteria. In addition, the uncertainty budget of the test's method and the uncertainty components were calculated. However, an external assessment of the test's performance has been achieved through participating in inter-comparison and proficiency testing exercises (IAEA, NPL, MAPEP and ERA). It was found that the implemented validation methodology at KISR's RML keeps the laboratory under control and improves its reputability, where it can be implemented in another laboratory.

### Biography

Abdulaziz Aba is a Radiometry Specialist and has a research experience of more than 20 years in the field of Radiation Detection and Measurements. His background is Physics & Chemistry (Aleppo University-Syria) and IAEA Safeguards. He joined KISR in 2008 as an Associate Research Specialist with a task to build the infrastructure of the radiation detection and measurements. He has been actively involved in the IAEA technical cooperation projects related to environmental protection and nuclear analytical techniques. Currently, he is a lab supervisor of the radioactivity measurements laboratory at KISR. He has published more than 20 papers in refereed journals.

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