



ANALYTICAL QUALITY CONTROL CONCEPT IN THE EURATOM ON-SITE LABORATORIES

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Two on-site laboratories have been developed, installed, commissioned and put into routine operation by the Euratom safeguards office (ESO), jointly with the Institute for Transuranium Elements (ITU). These laboratories are operated by ITU staff and provide verification measurement results on samples taken by Euratom inspectors. The analysts work in weekly changing shift teams, manage the laboratories and operate the various analytical techniques. Operating such a laboratory at a remote location, without a senior scientist immediately available in case of problems, the existing boundary conditions challenge the robustness of the entire laboratory, i.e. comprising staff and instrumentation. In order to continuously ensure a high degree of reliability of the measurement results, a stringent quality control system was implemented.

The quality control concept for the two on-site laboratories was developed at a very early stage and implemented in the pre-OSL training facility at ITU. This enabled to thoroughly test and develop further the concept. At the same time the analysts get acquainted with the quality control procedures in place and they are instilled with the principles.

The quality control concept makes use of a fully computerized data management and data acquisition system. All measurement devices, including balances, density meters, mass spectrometers, passive neutron counter, hybrid K-edge instrument, gamma spectrometers and alpha spectrometers are networked and data exchange is performed on electronic basis. A specifically developed laboratory information management system collects individual measurement data, calculates intermediate and final result and shares the information with a quality control module.

In order to ensure the reliability of the results, which are reported to the ESO inspectorate, five levels of quality control were implemented. The present paper describes in detail the different levels of quality control, which check the achieved precision and accuracy and provide the analyst a reliable basis for acceptance or rejection of an analytical result. This comprises the measurement of certified reference materials (CRMs), duplicate measurement of each sample, measurement of secondary standards (carefully calibrated against CRMs), exchange of samples between different methods and participation in interlaboratory measurement evaluation programmes. The paper will discuss the advantages and drawbacks of this quality control scheme and will highlight its fundamental role in the management of the on-site laboratory.