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Outcome and Perspectives from the first IAEA International Technical Meeting on Statistical Methodologies for Safeguards

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Statistical and probabilistic methodologies have always played a fundamental role in the field of safeguards. In-field inspection approaches are based on sampling algorithms and random verification schemes designed to achieve a designed detection probability for defects of interest (e.g. missing material, indicators of tampering with containment and other equipment, changes of design). In addition, the evaluation of verification data with a view to drawing soundly based safeguards conclusions rests on the application of various advanced statistical methodologies.
The considerable progress of information technology in the field of data processing and computational capabilities as well as the evolution of safeguards concepts and the steep increase in the volume of verification data in the last decades call for the review and modernization of safeguards statistical methodologies, not only to improve the efficiency of the analytical processes but also to address new statistical and probabilistic questions. Modern computer intensive approaches are also needed to fully exploit the large body of verification data collected over the years in the increasing number and diversifying types of nuclear fuel cycle facilities in the world.
The first biennial IAEA International Technical Meeting on Statistical Methodologies for Safeguards was held in Vienna from the 16 to 18 October 2013. Recommendations and a working plan were drafted which identify and chart necessary steps to review, harmonize, update and consolidate statistical methodologies for safeguards. Three major problem spaces were identified: Random Verification Schemes, Estimation of Uncertainties and Statistical Evaluation of Safeguards Verification Data for which a detailed list of objectives and actions to be taken were established.
Since the meeting, considerable progress was made to meet these objectives. The actions undertaken and their outcome are presented in this paper.

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