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IDENTIFICATION OF NORM FACILITIES IN BULGARIA – METHODICAL APPROACH AND RESULTS

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Article 40 of the EU Directive 96/29 requires that each Member State ensures the identification of work activities, which may be of concern regarding naturally occurring radioactivity. In Article 40 it is mentioned that this investigation shall be done by surveys or other appropriate methods. Further hints concerning the methods of such investigations are given in the recommendations of the European Commission RP 88 as well as numerous papers in the literature describing the occurrence of radioactivity in industrial facilities. But practical experience has shown that a comprehensive overview of the radioactivity of NORM or TENORM in an individual facility may be difficult to obtain in a single survey. Furthermore, changes of feed materials or changes of technologies (e.g. installation of dust filters) may result in materials of quite other radiological assessments.

Based on this statement an approach was developed, which consists of two main steps, the preparation and conduction of field investigations as well as the evaluation and assessment of the results obtained.

The preparation of field investigations started with a preliminary assessment of the current situation, aimed to identify the most important Bulgarian NORM industries, in terms of their associated radiological risk. From these industries, several representative sites were chosen as subject of radiological investigations. A fact finding mission was then carried out, consisting in in-situ measurements of external radiation fields and determination of radioactive concentrations in raw materials, residues, by-products or products, as appropriate. Representative samples were collected for further laboratory measurements and analyses.

The evaluation and assessment of the results obtained was done in four separate steps. As first, the normalized nuclide composition of the long-lived radionuclides ^{238}U, ^{226}Ra, ^{210}Pb, (^{232}Th), ^{228}Ra and ^{228}Th was used to classify the materials and to check the efficiency of radionuclide redistributions in the technological processes independently on the specific activity. As second, parameters of TENORM formation, especially the nuclide specific enrichment factors, were calculated for all appropriate facilities. As third, the doses for workers or members of the public for the existing situation were estimated from the activity concentrations measured and using default parameters of model scenarios. Finally, in a last step the individual facility and the industrial sector this facility belongs to were assessed regarding potential changes which

may result in a significant increase in the exposure of workers or of members of the public which cannot be disregarded from the radiation protection point of view.

This investigation gave an overall image of the Bulgarian situation, to be used in deriving the level of the necessary regulatory regime of these activities in Bulgaria. The method is quite general and can be applied to regions or countries, in which have not yet been made a systematic investigation of naturally occurring radioactivity in industrial sectors.