

THE HOLISTIC APPROACH TO NORM MANAGEMENT

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NORM has been subject of a wide range of studies for over 3 decades. Despite all these efforts and observed progress, gaps need to be addressed and new perspectives have been raised. Among the existing challenges its worth mentioning the potential environmental impacts associated with the operation of NORM related industries and the need for proper (safe, timely and cost-effective) management of generated residues (including remediation of legacy sites). In 1999 a symposium organised in Rio de Janeiro (when the acronym TENR to represent Technologically Enhanced Natural Radiation was used instead of NORM) indicated that “the legislative radiation protection framework was seen as usually complex and confusing in different nations when dealing with the exposure to natural sources of radiation”. It continued by saying that “the assumptions used in modelling such exposures were not entirely correct and the results of the theoretical risk assessment did not correspond with data available at the national and industrial levels”. It did indicate that “available information could contribute significantly to a better understanding of the risk” but recognized that “this information was fragmented, with various parties possessing incomplete data and that a clear need for co-operation between regulatory authorities and industries was necessary. The event proposed the creation of the Natural Material Radiation Control Initiative (NMRCI). In NORM IV in Poland (2004), recommendation was made to “move towards the use of facility-specific measurements, especially for dose assessment purposes, instead of relying on modelling using standardized scenarios and generalized assumptions”. In NORM V in Spain (2007) emphasis was given to “the use, reuse and recycling of NORM residues and NORM-contaminated items — including, where appropriate, the dilution of NORM residues to reduce the activity concentration. Three years later in in NORM VI (Morocco) it was recognised “that an industry driven (or even process driven) approach was needed for ensuring that exposures to NORM were controlled sensibly and effectively”. It was also proposed that “there was no such thing as universal best practice for NORM”. The symposium confirmed an “increasing recognition of the need to regard NORM residues as a resource rather than as waste”. In NORM VII in China (2007), industries were called “to think about how they could make convincing optimization cases for the full NORM life cycle” and to produce “reliable data on exposures to underpin the decision-making process”. In NORM VIII in Rio de Janeiro (2016), it has been indicated that a

“tendency to overestimate doses arising from industrial facilities involving NORM” was taking place. Supporting this statement, example was given on the reliance “on conservative exposure modelling rather than measurements on site” by adopting assessment approaches that were considered too simplistic, or by not considering the contribution of background radiation. The Symposium called for “a new approach which encompassed, among other things, an environmentally sustainable, socially acceptable, affordable solution to the problem of residues”. Building upon all these events (by the way, sponsored by the IAEA), the Agency organised its first Conference on NORM in 2020 – “The NORM2020 International Conference”. The Conference was organised in a fully virtual capacity and that allowed a massive participation from professionals from different regions in the world. Important to note that the chair of the Conference came from the Oil and Gas industry which was seen as a strong message to the international community. In addition to the technical sessions a series of dedicated workshops covered a wide variety of themes. While in previous versions of NORM Symposia series the concept of recycling and reuse was called upon, in NORM2020 a further development was noticed, and the concept of the circular economy permeated many of the discussions during the conference. But circular economy, that links with the concepts of life cycle and sustainability, will only be possible if a Holistic Approach to NORM Management is in place. The NORM2020 conference somehow endorsed the concept of the Holistic Approach developed in the scope of the IAEA-Environet NORM Project that include, among other elements, guidance on the development of policy and strategies for NORM, well defined inventories supported by robust and harmonized sampling and characterization protocols. Circular economy is addressed by the project within a 360o perspective along with cost-estimate of different management options and actions oriented to decommissioning of NORM related facilities. The detailed examination of the Holistic Approach in support of the sustainable development within which circular economy consideration is critical will be the object of the Environet dedicated session in NORM X.