

(2) Overview of ICRP approach to waste management

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Abstract—The International Commission on Radiological Protection (ICRP) Task Group 97 has been working on application of the Commission's recommendations for surface and near surface disposal of solid radioactive waste to prepare a plain-language publication that describes and clarifies the application of the recommendations for the protection of the public and workers (*Publications 101 & 103*) as well as the environment (*Publication 124*). The 2007 Recommendations of the ICRP recognized three types of exposure situations: planned, emergency, and existing situations. For each of the situations, the three fundamental guiding principles of radiation protection (i.e. justification, optimisation, and dose limitation) are applied. This presentation provides an overview on the application of the three principles to waste disposal by first providing the basic principle and then, some implication or aspect that results from waste disposal, especially, the consideration of the long time periods post-closure. After an introduction to the principles, an overview of the three exposure situations is provided. Utilizing the fundamental principles and exposure situations, an overview of waste disposal applications is reviewed. In the vast majority of cases, the design and operation of a waste disposal site is a planned exposure situation. Some countries may have legacy sites, such as sites with mining waste that were later brought under regulatory control. Emphasis is placed on the fact that while the activity is planned, the doses in the future are not. Many of the actions taken today are to reduce the probability and consequence of an exposure occurring, i.e. a potential exposure. Waste disposal involves long time periods and a reliance on passive safety systems. Due to these time periods, it is impossible to know if people would be present in to be exposed at a specific time period. Therefore, the Commission recommends using a hypothetical representative individual for the long-term dose and risk calculations. In addition to human health metrics using representative individuals, the Commission recommends using the Reference Animals and Plants as one approach to assess impacts to the environment. While this can have challenges similar to the representative individual due the long time periods resulting in a change in the environment, the use of Reference Animals and Plants offers an additional line of argument and reasoning in building a safety case using endpoints that are different from, but complementary to, protection of human health. Consideration of environmental protection, where appropriate, will thus broaden the basis for risk-informed decision making, and address issues that may have differing levels of importance for different stakeholders.