Contribution ID: **67** Type: **ORAL**

Development of a System to Get Data for the Periodic Assessment of the Radiation Doses due to the Transport of Radioactive Material in Türkiye

The study focuses on the periodic assessment of radiation exposures to workers and members of the public arising from the transport of radioactive materials within, to, and from Türkiye, acknowledging that the safe transport of such materials is an essential element of radiation protection and nuclear safety since they are routinely transported for medical and industrial purposes. The actual level of exposure depends on a combination of factors, including the type and intensity of radiation, the design and shielding characteristics of packages, the amount of time workers spend in proximity to them, and the specific working arrangements of transport and handling personnel. While doses are usually expected to remain within very low ranges, it is important to conduct systematic, evidence-based, and periodically repeated assessments to confirm compliance with international safety standards and to identify where additional protective measures or optimization efforts may be beneficial. In line with the International Atomic Energy Agency (IAEA) Regulations for the Safe Transport of Radioactive Material (2018 edition), competent national authorities are required to ensure periodic evaluation of the radiological impact of routine transport. This obligation was further underlined by the 2022 IAEA Integrated Regulatory Review Service (IRRS) mission to Türkiye, which recommended that the Nuclear Regulatory Authority of Türkiye (NDK) should arrange for the periodic assessment of the radiation doses due to the transport of radioactive material, to ensure that the system of protection and safety complies with GSR Part 3. Against this background, the present study introduces a framework for development of such a system in Türkiye, relying on structured data collection and standardized dose estimation methodologies. Data are being collected through voluntary surveys sent to NDK-licensed transport companies, covering types and quantities of radioactive material, package categories and shipment frequencies, modes and routes of transport, and detailed information on the working conditions of drivers and loading staff.

The survey also includes questions on time spent near packages, and measurements of radiation dose rates around vehicles, all of which provide a realistic foundation for estimating occupational exposures and, where relevant, public exposures along transport routes or during handling operations. Transportation of high activity radioactive sources within the country is also examined in this study.

The collected data is analyzed using internationally recognized dose assessment approaches to estimate annual doses for transport workers and to identify possible scenarios in which the public might also receive measurable doses. These estimates is then be compared with IAEA reference levels and national regulatory requirements, thereby providing both regulators and industry with a clear picture of current exposure levels. Outcomes provided an enhanced regulatory oversight through the establishment of a consistent national system for periodic assessment and the provision of evidence-based feedback to transport operators that can help them evaluate radiation protection performance and identify practical ways to further optimize safety practices. In this way, the project represents an important step toward creating a sustainable, transparent, and systematic approach to monitoring and managing radiation doses from the transport of radioactive materials in Türkiye, ensuring that transport activities continue to be conducted in full compliance with safety principles while protecting both workers and the public.

Country or International Organization

Instructions

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Track Classification: Track 3 Safety and Security during Transport Operations