Scenarios Concerning the Transportation of NORM in Germany

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Abstract:
The investigations were carried out within the IAEA CRP on safe transport of NORM.
For the analysis and evaluation of the radiation exposure due to the shipment of NORM for ten different materials a couple of transport scenarios were defined and the dose to transport workers was calculated.
For the calculation of the dose measured data of radionuclide concentrations in these materials were used. The model parameters were taken from authorized dose calculation procedures related to remediation of legacies from uranium mining and milling and adopted to the relevant transport scenarios or determined by experiments.
The defined transport scenarios included both, the drivers of transport vehicles as well as the staff dealing of loading and unloading. Furthermore, it was divided between scenarios for bulky or unpackaged transport and packaged transport. It could be demonstrated that only for bulky transport scenarios the dose due to inhalation of contaminated dust have to be considered in addition to the external dose by γ-radiation.
Special attention was paid on the dose resulting from transport of materials with non-equilibrium of radionuclides of the Uranium-Radium-decay chain and the Thorium-decay chain. That concerns e.g. pipe scales and drilling sludge from the oil & gas exploitation.
On the basis of the results on dose calculation for the transport of NORM recommendations for updating the IAEA safety guide TS-R-1 related to NORM are given as far as the proposed dose limit of 0.3 mSv yr^{-1} for transport personnel will be accepted bei TRANSSC.