DEVELOPMENT OF SMR TECHNOLOGY IN POLAND - MANAGEMENT OF RADIOACTIVE WASTE AND SPENT NUCLEAR FUEL

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In connection with the EU's climate goal and the planned phasing out of the largest conventional power units many energy companies in Poland have expressed their willingness to build and use SMRs. It was estimated that by 2030, Poland could have 22 SMRs with a total capacity of about 4 GW, which would produce electrical and thermal energy. This is a response to the challenge posed by the ambitious goal that has been adopted, namely the decarbonisation of the Polish energy sector in order to significantly reduce CO_2 emissions into the environment. Despite the many perceived advantages of SMR technology, the implementation of small nuclear reactors, especially the next generation, will require addressing numerous challenges. One of the challenges will be the management of spent nuclear fuel and radioactive waste generated during the operation of these reactors, as well as the waste generated during their decommissioning.
In light of the great interest in the development of SMR technology in Poland, there is a need to conduct in-depth analyses of the above-mentioned issues to make the SMR implementation process as safe as possible. Analyses currently being conducted at the INCT within the framework of various research projects aim to assess existing SMR technologies and methods of handling spent fuel and the radioactive waste originating from these technologies. The developed methodology for waste management includes, among others, determining input data such as fuel and coolant type, reactor operational life and other factors such as: refuelling intervals, planned maintenance program. Output data are also analyzed, i.e. mass, volume, activity and toxicity of waste. The issue related to the standardization of waste generation is also considered, as it is necessary to determine whether waste will be assessed in relation to its quantity or activity on the amount of energy produced or on the reactor unit.

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