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EUROPEAN COMMISSION'S JOINT RESEARCH CENTRE RESEARCH ON THE SAFETY OF SPENT FUEL AND HIGH LEVEL RADIOACTIVE WASTE MANAGEMENT

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The management of the spent fuel in the EU is addressed in alignment with Council Directive 2011/70/Euratom, which aims at the safe and responsible management of radioactive waste and spent fuel in order to avoid imposing undue burdens to the future generations; at ensuring the highest levels of safety; and at ensuring transparency and the involvement of the public in the decision-making process. Twenty one EU Member States manage about 59 000 tHM of spent fuel generated in past and current nuclear power generation and nuclear research activities. Each year, about 3 200 tHM of additional spent fuel are generated. Some Member States reprocess spent fuel and some others have decided to keep this option open. The majority of the EU Member States have opted for direct disposal of their spent fuel. Right now the EU does not have in its territory any facility for the disposal of spent fuel, high level and long-lived radioactive waste. Finland, Sweden and France expect to start the operation of their deep geological disposal facilities within the next two decades, while the rest of the MS with nuclear programmes have planned operating disposal facilities in the time interval 2040-2130, with a peak in the decade of 2060-2070. Long-term or extended interim storage is thus instrumental in the national strategies for the management of spent fuel prior to reprocessing or disposal. The Euratom Research and Training Programme contributes, within its portfolio of activities, to the safe management of spent fuel and radioactive waste. This is done through indirect research and innovation activities to which the European Union provides financial support and which are undertaken by EU Member States research entities, and through direct research and innovation activities undertaken by the Commission through its Joint Research Centre (the 'JRC': the European Commission's science and knowledge service). This paper provides an overview of the JRC areas of research relevant for safety of spent fuel (and high level radioactive waste), which cover all stages of spent fuel management since it is removed from the reactor: cooling in the spent fuel pool; handling, transport, storage (with particular emphasis on long-term storage); retrieval, handling and transportation after storage; disposal in a deep geological formation, and long term safety aspects thereafter. The paper highlights the main achievements, and the main challenges, stressing the relevance of the experimental work carried out on "real" spent fuel in JRC's research infrastructure, which include hot cells and other shielded facilities that are relatively rare or even unique.

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Country or International Organization

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