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An Integrated Approach to Aging Management of Spent Fuel Dry Storage Systems in the United States

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In the United States, an approach to manage the aging of spent fuel dry storage systems was created by contributions from the regulatory body, storage facility owners, cask vendors, and the engineering community. The U.S. regulations for storing spent fuel beyond the first approved storage term require aging management activities to ensure that materials degradation will not adversely affect the safe storage of the spent fuel. Several guidance documents provide recommendations for complying with this regulation. The U.S. Nuclear Regulatory Commission (NRC) and the Nuclear Energy Institute (NEI) developed NUREG-1927 and NEI 14-03, respectively, to describe methods to identify the components that support a safety function, to evaluate the aging mechanisms could affect safety, and to establish aging management activities. The NEI guidance also introduces a new system to share operating experience through an Institute of Nuclear Power Operations database. The NRC also developed NUREG-2214 to identify the credible materials aging mechanisms for several cask designs used in the United States. NUREG-2214 also provides example aging management programs that may be used to effectively manage aging. Those programs rely, in part, on consensus codes and standards for monitoring and inspection guidelines, such as American Concrete Institute codes and the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. Finally, to provide oversight of aging management activities, the NRC is developing internal procedures to evaluate, through inspection, the storage facilities'performance of their aging management programs. Lessons learned from NRC Temporary Instruction TI 2690/011 will inform the development of a new NRC inspection procedure.

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