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Regulatory Challenges Encountered at Designing Ageing Management Program for Safety Related SSC's in Hypothetical Nuclear Fuel Cycle Facility

As with other nuclear installations, ageing management of nuclear fuel cycle facilities (FCFs) entails guaranteeing the availability of needed safety functions throughout their service life while taking into account changes that occur with time and use. This necessitates addressing both physical ageing, which causes degradation of structures, systems, and components (SSCs) critical to safety, and obsolescence of SSCs, which causes them to become out of date with current knowledge, standards, regulations, and technology, potentially resulting in a lack of spare equipment. This paper proposes a design ageing management system in a hypothetical nuclear fuel cycle facility for safety related to structures, systems, and component concepts in order to reduce the risk associated with variant operation and environmental conditions in which the characteristics of SSCs gradually change with time or use. In addition, we will execute any necessary upgrades to the ageing management system by evaluating the nuclear plant layout and taking into account all of the ageing management layers design to improve the vulnerability for risk reduction.

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