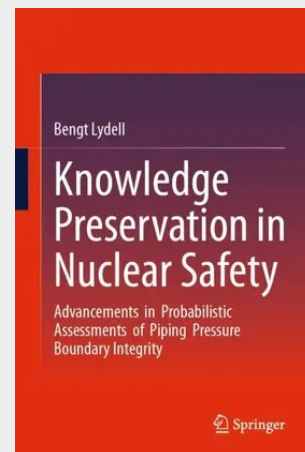


Knowledge Preservation in Nuclear Safety

Advancements in Probabilistic Assessments of Piping Pressure Boundary Integrity

The preservation of both explicit and tacit knowledge is crucial for nuclear safety. This practical guide provides an engineering perspective to help future engineers and scientists access vital information on material performance and piping safety. It emphasizes ongoing engagement in nuclear safety and risk assessment, presenting a framework that integrates theory, practical applications, design elements, and evaluation standards. It highlights effective data-collection strategies critical to current and future risk assessments, building on research from 1955 to 1975 on non-nuclear piping systems and detailing developments from 1975 to 2025. The resource captures evolving methods and techniques and presents data relevant to risk and reliability analyses for new and advanced reactors. Additionally, it guides the conversion of existing knowledge into probabilistic metrics to assist decision-makers. A review of material performance in commercial nuclear power plants helps professionals grasp the implications of various findings. Coverage also includes methods for assessing the probability of failure in passive components and establishes a common language for pressure boundary integrity, supporting risk-informed decisions. Case studies and examples clarify complex concepts, enhancing usability for professionals conducting safety assessments and managing risks.

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