

CENTRALIZED SPENT FUEL & WASTE MANAGEMENT FOR LFRs: SITE, INFRASTRUCTURE AND SUPPORTING FACILITIES

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The deployment of Lead-Cooled Fast Reactors (LFRs) in Europe requires a well-structured approach to spent fuel and waste management, with a focus on establishing a centralized facility capable of ensuring long-term safety, operational efficiency, and compliance with evolving international regulations. The establishment of a well-integrated facility will streamline waste management logistics, reduce costs, and enhance coordination across European nuclear programs, fostering regional collaboration and knowledge sharing. This study explores key considerations related to site selection, infrastructure planning, and supporting facilities, which are essential for the facility's long-term viability and seamless integration into Europe's nuclear energy programs. Site selection involves evaluating multiple factors, including geological stability, transport accessibility, security, environmental impact, and regulatory frameworks, to ensure a safe, sustainable, and strategically positioned facility. Infrastructure planning must incorporate provisions for spent fuel handling, interim storage, and long-term adaptability while maintaining operational efficiency and cost-effectiveness. Supporting facilities will play a vital role in ensuring that all processes are conducted under strict safety, security, and non-proliferation standards, contributing to the overall resilience and sustainability of the nuclear sector. By addressing these critical aspects, from different standpoints, this study contributes to the implementation of a centralized spent fuel and waste management facility as a key enabler for LFR deployment, thus facilitating the transition to a more sustainable and secure nuclear energy future in Europe.

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