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## **THE STATE OF ART IN SPENT FUEL MANAGEMENT AND RECOMMENDATIONS FOR SOUTH AFRICA'S VAALPUTS**

Nuclear, of high energy density, is completely fenced off from the general environment. Given Koeberg's four decades of operations, the business result delivered was zero environmental air emissions and zero disposal of high-level waste into the environment. All the spent fuel assemblies, since commissioning of the two nuclear reactors in the mid-eighties, remain in the spent fuel pool in the reactor containment building. In the first year of storage, the radioactive nuclides in the material would have decayed very quickly. After ten years and onto forty years, the fuel assembly would have greatly reduced heat and radioactive content. However, the potential for radioactivity will continue for hundreds of years.

The recommendation is for the current spent fuel pool storage and monitoring of assemblies and radioactivity, as designed, be sustained. A new facility can be built off site at the Vaalputs Radioactive Waste Disposal locality. The facility can be sustained into time with continuous monitoring of radiation in lieu of the deep geological burial and forget approach. The sustainment of the spent fuel pool storage and monitoring approach will enhance and promote societal acceptance of the extremely long time to radioactive decay, given continuous certification and reporting of regulatory, safety and environmental compliance into time. The paper explores the state of art in spent fuel management.

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