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Advancements in Thermal Energy Storage Systems: Paving the Way for a Sustainable Future

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Abstract

The Thermal Energy Storage Tank's operation requires understanding its heat storage and release characteristics. Verification testing at a larger scale, 10MWh, than the previous one will evaluate heat transfer behavior and correlation equations' validity, with practicality confirmed in 2026. The tank, made of concrete, must meet seismic requirements and withstand temperatures over 700°C, integrating electric heaters for enhanced temperature gradients. The Plant Control System aims for superior load responsiveness, with simulations showing promise, but actual plant testing for operational control is necessary. The Thermal Energy Management System seeks to optimize internal thermal energy adjustment in various plants, with economic operation confirmed through practical application.