

770 - Electric Heating Systems for Electric Thermal Energy Storage (eTES)

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Abstract: A number of thermal energy storage technologies are competing for shares in the energy storage market. The thermal energy input into the systems will frequently come from electric heating systems. These systems typically have process temperature needs of 560 to 900+C. Also, the systems normally use megawatts of power from renewable energy sources. The electrical heating systems are often designed at or near the peak available power to maximize the amount of energy stored.

As such the electrical heating systems require control system solutions not normally needed in electrical process heaters operating well below the available power.

The paper will show the design of very large megawatt heating systems for electric thermal energy storage, including both the heaters and the control system. Special emphasis will be placed on the needs of the control systems to assure reliable operation in situations that are consuming all or nearly all of the available power, with consideration of the needed durability and reliability.