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Project: Dynamic Simulation and Operations of a
Molten Salt Tower System
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Background

CSP with Molten Salt Tower Systems use heliostats that concentrate the solar energy to a specific area at the top of the tower. Heat is transferred to molten salts that flow through pipes in the heated area, and then complete a typical Rankine cycle.

Historical experiences in the operation of these systems have shown that there are non-addressed complexities in this technology that impede to achieve required levels of performance.

Some of the issues are related with the transient behavior of the plants, and how operators make decisions without knowing the consequences of these transients in the equipment.

For example, start-up, shut-downs or clouds can contribute to high temperature gradients, which could lead to failure or corrective maintenance to equipment.





Project Goals

- Model with TRNSYS the thermal and hydraulic behavior of a Molten Salt Tower System, aiming to replicate the transient response of the power plant with the model.
- Understand the issues that operators are currently facing with CSP technology and integrate these variables into the model, aiming to contribute to the daily operation decision making.
- Contribute to improve the performance of Molten Salt Tower Systems, by making a model that suits the dynamic behavior of the plants and is tailored to the needs of the industry.



(1) solar field, (2) cold salt tank, (3) tower with receiver, (4) hot salt tank, (5) steam generator, (6) steam turbine, (7) electric generator, (8) electrical transformer.