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Project: Molten Salt Pump Development for Solar and Nuclear Power Systems
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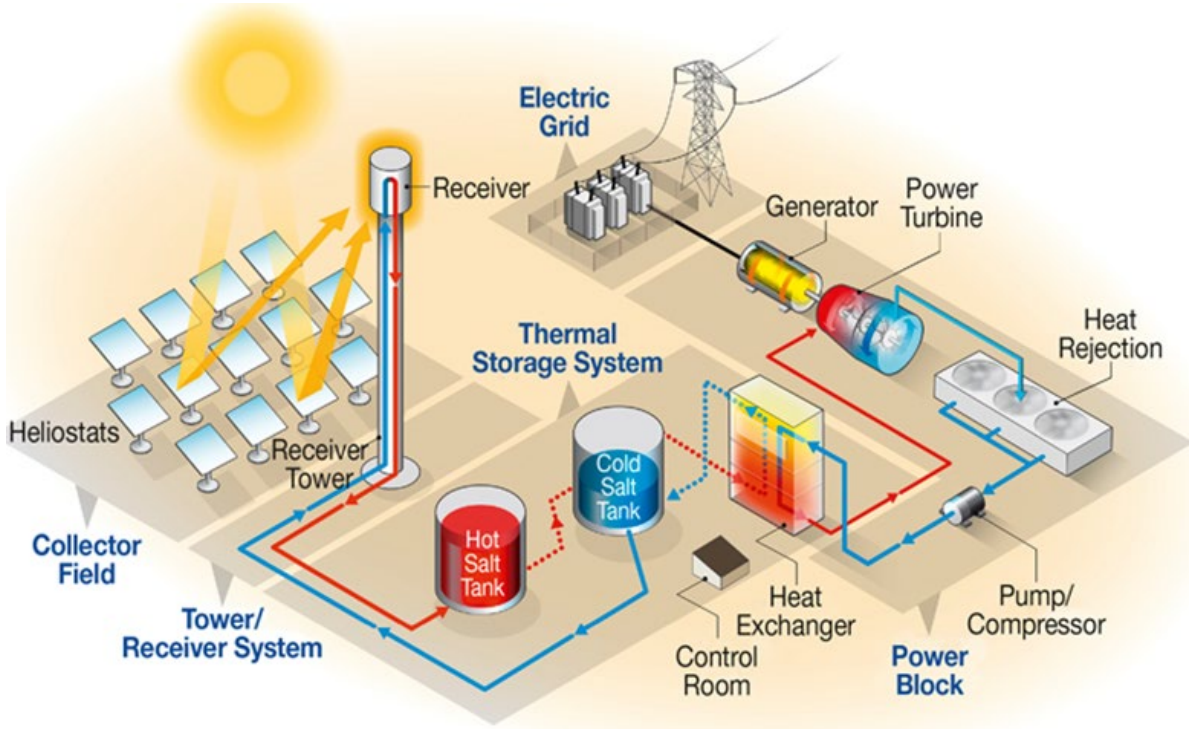
Sponsor: NEUP, SETO, DOE

Background

The need to reduce our carbon footprint has led to the research of alternative energy systems (production and storage). Initiatives set by the Department of Energy include:

- Explore Gen 3 CSP systems that aim to operate at 700°C and achieve a heat to electricity efficiency of 50%.
- Develop the technological foundations to enable MSRs for safe and economical operations while maintaining a high level of proliferation resistance.

Pumps used in these applications need to withstand high temperatures (700+°C) and a corrosive molten salt environment. To be successful, pumps need to be hermetically sealed, serviceable, robust, and economical.



Gen 3 CSP System

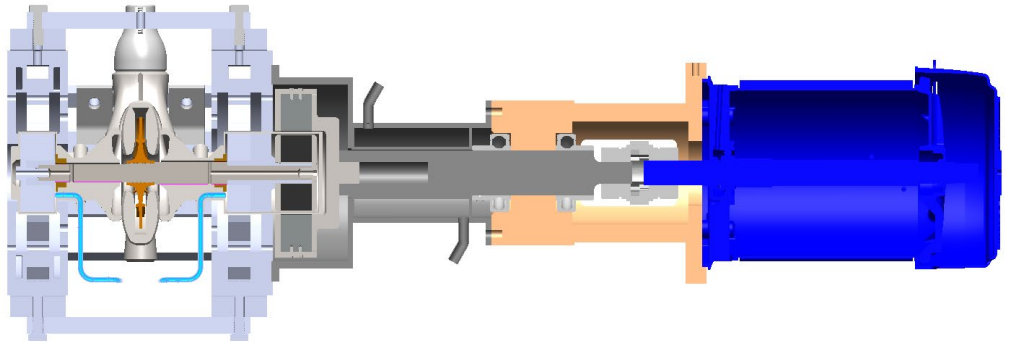
Project Goals

1. Understand corrosion rates of materials inside of the pump to better estimate pump lifetime and servicing costs.

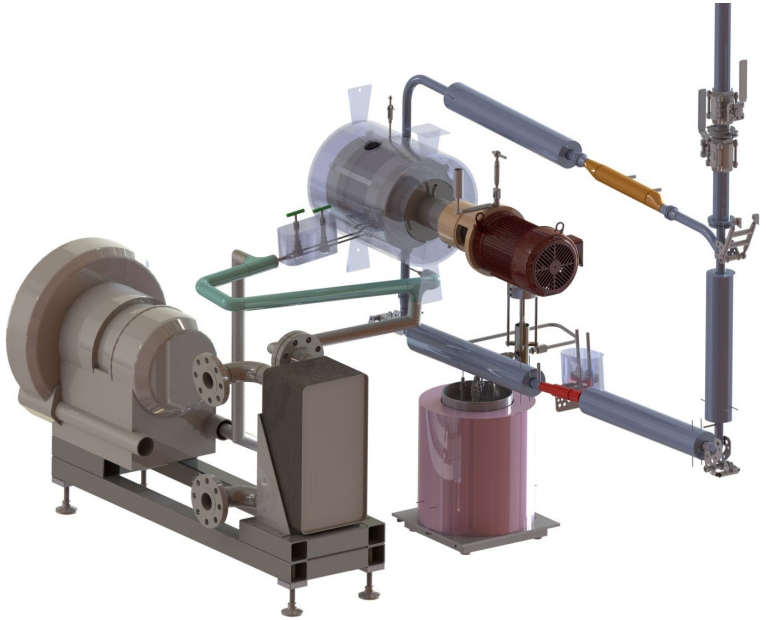
2. Develop an advanced pump design that utilizes salt wetted bearings, advanced materials, and advanced manufacturing technologies.

3. Manufacture and assemble laboratory-scale salt pump prototype suitable for MSR and CSP applications.

4. Integrate salt pump into a loop to perform experiments that test the performance and limits of the pump.



Impeller Pump designed to operate at 750°C



Integration design of pump inside salt loop