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Project: Performance Improvements in CSP Plant Operations
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Sponsor: Department of Energy

SEL

ENERGY SYSTEMS OPTIMIZATION LAB

Background

Solana Generating Station is the largest parabolic trough CSP plant in the world. It is a 280 MW power plant that also uses thermal energy storage technology to produce energy after the sun sets.

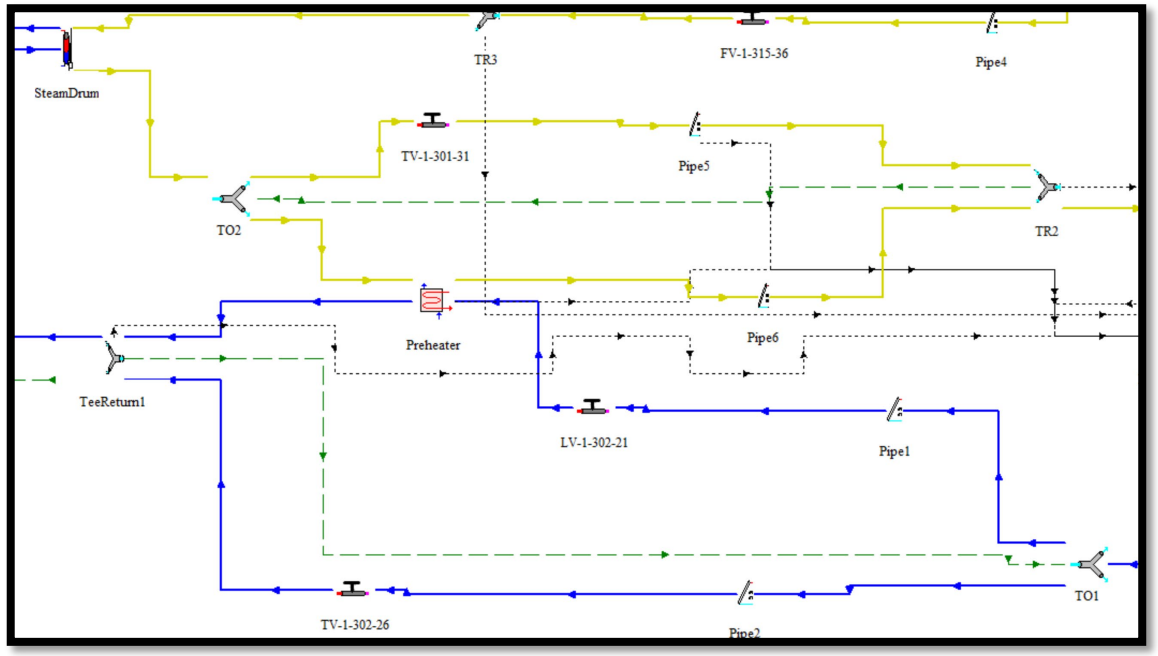
Solana wants to train employees in how to operate the power block in a no-risk scenario (computer simulation).

Portion of the Parabolic Troughs used at Solana

One of Solana's Power Blocks

Project Goals

TRNSYS is a software created at UW that simulates transient systems. A TRNSYS type is a set of code used to model the behavior of what the type is emulating. During a timestep, TRNSYS runs each type and iterates until all the types agree with one another.



My Goals are to …

- Create a transient power block model in TRNSYS that replicates the Solana CSP power block
  - Uses small timesteps (~1 seconds) to make training more realistic
  - Includes complex hydraulic networks for start-up and shut-down scenarios
- Create TRNSYS types that are accurate and can be easily altered to fit other power plants