Digital Twin Engineering – Project Work

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Pumped Storage Power Plant

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System Description

A Pumped Storage Power Plant generally consist of two tanks on a different height level, connected by pipes. It's used for storing energy in a Situation of high energy production mainly from volatile energy sources by pumping water from the lower to the upper tank.
The energy can be transformed back to electrical energy using the potential energy of the water flowing back down through a turbine.

What is the goal of the simulation

Showing the correlation between the electrical energy and the potential energy of the water. Mainly by observing the water levels in the tanks and the input/generated power of the generator.

What should be simulated? What are the results that can be seen in the results views?

- Electrical energy input/output
- Water level in tanks
- Water flow through pipes

Objects to be modelled

- Object 1: Watertank
- Object 2: Pipe
- Object 3: Valve
- Object 4: Generator
- Object 5: Turbine
- Object 6: Pump
- Object 7: Environmental influences (water inlet, rain)

Connectors to be modelled

- Connector 1: Hydraulic port
- Connector 2: Electrical port

System Sketch / Graphical System overview