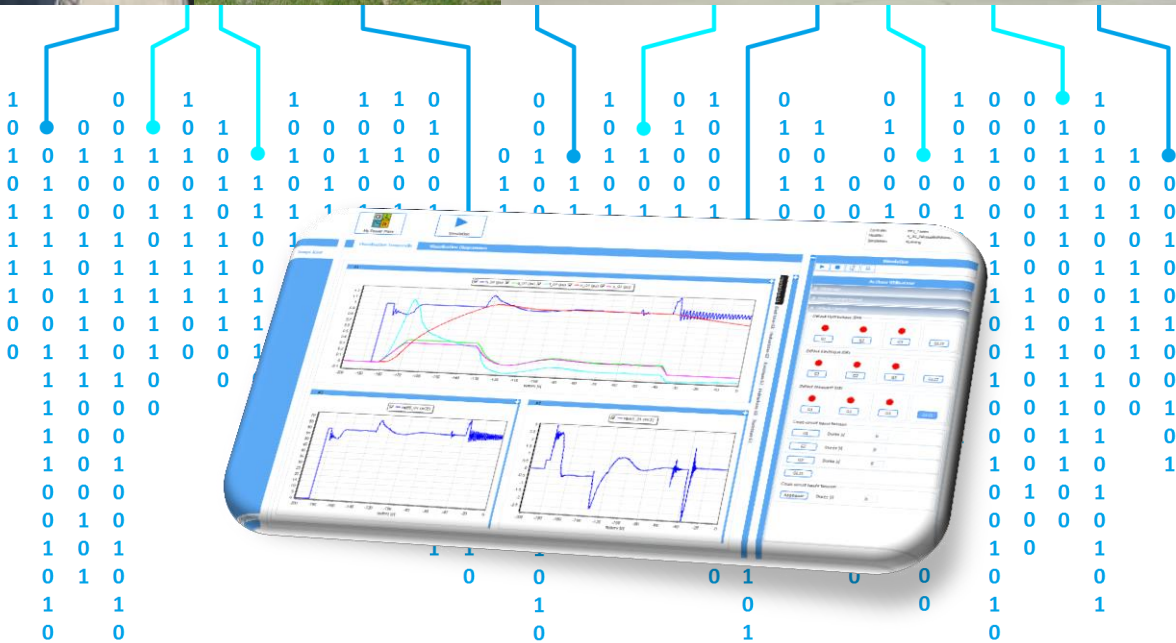


# MyHPP Simulator

Control your Digital HPP and Simulate its Transient Behavior



Didactic Tool for Collaborators

Digital Twin of Hydroelectric Power Plant (HPP) for Real-Time Transient Simulations

Simulate your Events in Real-Time and Visualize the Response of the Digital HPP

# MyHPP Simulator

## Digital Twin of Hydroelectric Power Plant

- SIMSEN model for transient simulations
- Real-time simulations



**SIMSEN**

## User-friendly interface

### Select User Events

- Start and synchronization of units
- Normal stop, quick stop
- Load rejection
- Emergency shutdown
- Valve closures
- Active and reactive power variation
- Voltage and frequency network variation
- Electrical short-circuit ...

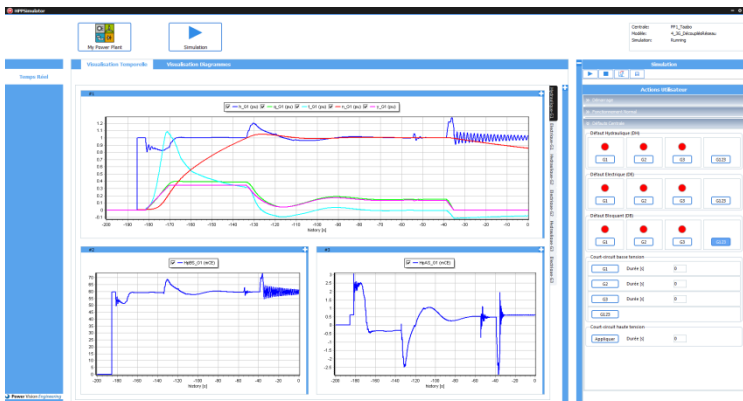
**Real-Time Interaction**

### Visualization with Time Charts

- Custom positions of time charts
- Custom settings of channels

### Visualization with Synoptic Diagrams

- State overview of the hydroelectric power plant

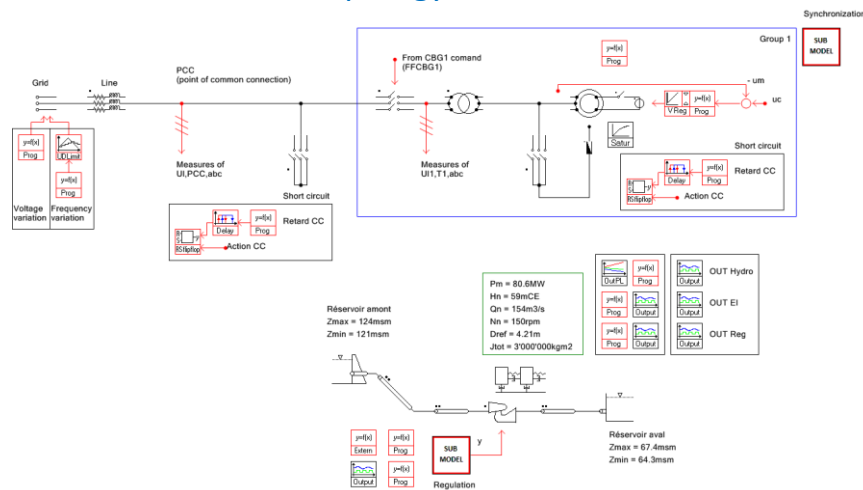


User-friendly interface

# Control your Digital HPP and Simulate its Transient Behavior

## Digital Twin of Hydroelectric Power Plant

- Modelling of the hydroelectric power plant for transient simulations including hydraulic, mechanical, electrical and control systems:
  - All types of hydraulic machines: Pelton, Francis, Kaplan, Pump-Turbine
  - All types of electrical machines: synchronous, asynchronous
  - Complex control structure : AVR, PSS, Turbine governor PID, Synchronization
- Library of models with fixed topology



## MyHPP Simulator Users

### Basic User

- Use of existing models in library
- Simulations of transient behaviour by selecting user events from MyHPPSimulator

### Advanced User

- Creation of customized user models to enrich the library
- Modification of model parameters for customized user models:
  - Boundary conditions: reservoir elevations, set points of the units...
  - Physical and geometrical parameters : pipe's wave speed, pipe's length and diameter, inertia, impedance of electrical lines ...
  - Control command parameters
  - Opening and closing time of system components
- Simulations of transient behaviour by selecting user events from MyHPPSimulator and assessment of model parameters influence

### Tool for didactic purpose

# MyHPP Simulator

Control your Digital HPP and Simulate its Transient Behavior

With MyHPP Simulator, the user can take control in real-time of a digital hydroelectric power plant and simulate any transient behaviour. This is a powerful didactic tool to:

- Get knowledge about physical phenomena which drive the operating of the HPP
- To train on the operation of the HPP by simulating scenarios which can occur in reality
- To understand the technical issues of the operation of HPP

## MyHPP Simulator Services

### Digitalizing of your Hydroelectric Power Plants

- Modelling of the hydroelectric power plant
- Model validation with measurements

### Configuration of MyHPP Simulator to your Hydroelectric Power Plants

- Configuration of models to interact with MyHPP Simulator
- Integration of the models library into MyHPP Simulator
- Definition of a start configuration of MyHPP Simulator:
  - Visualization environment
  - Monitoring quantities of interest

### Training


- Functionalities of MyHPP Simulator
- Physics of transient behaviours of hydroelectric powerplants
- Two training levels:
  - For basic users
  - For advanced users which will be afterwards in charge of training your collaborators



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