OUTLINE

Controlled Generator on Grid

- The main functions of an Automatic Voltage Regulator (AVR)
- The main functions of a Power System Stabilizer (PSS)

How to test an AVR system

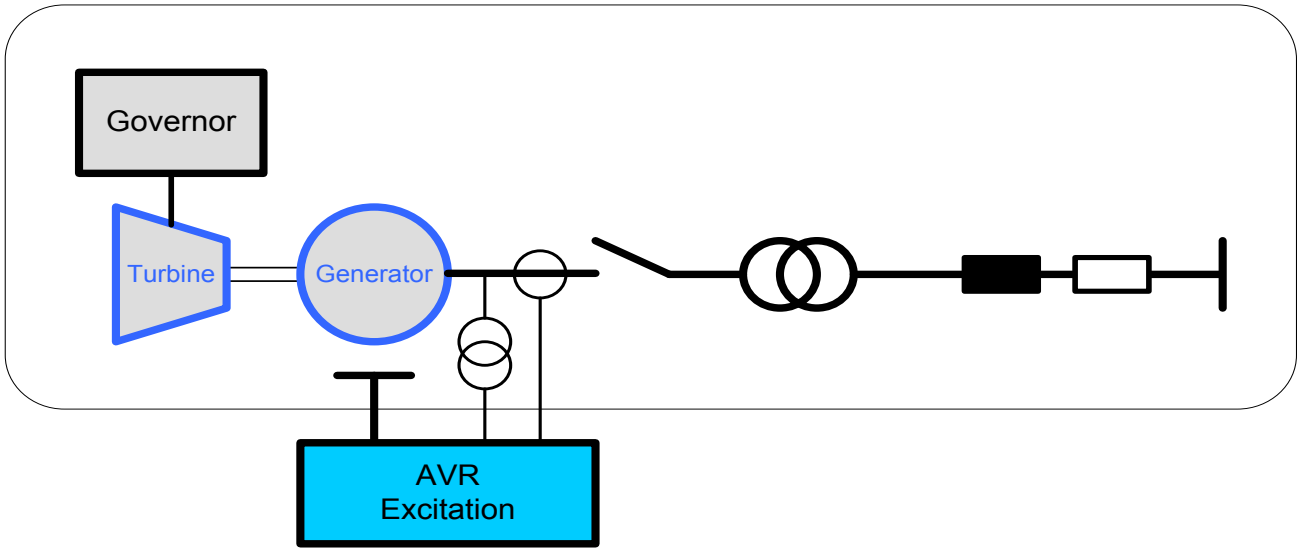
- Introduction to Real Time Simulator

Grid Code compliance testing

- UNITROL built in compliance test functions

Synchronous Machine Transient Simulator

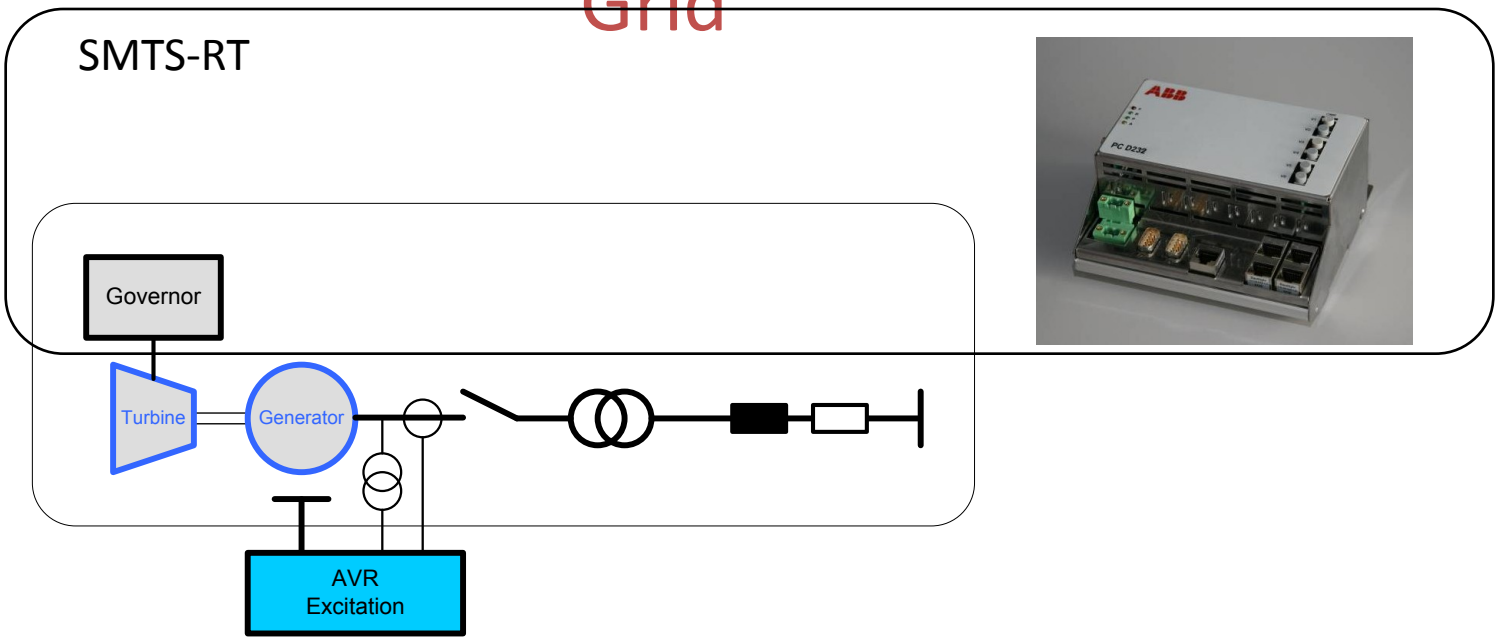
Turbine, Generator, Transformer, Line to infinite Bus



Typical turbine - generator arrangement in a power plant
Automatic Voltage Regulator (AVR)

Synchronous Machine Transient Simulator

Turbine, Generator, Transformer, Line to infinite Grid

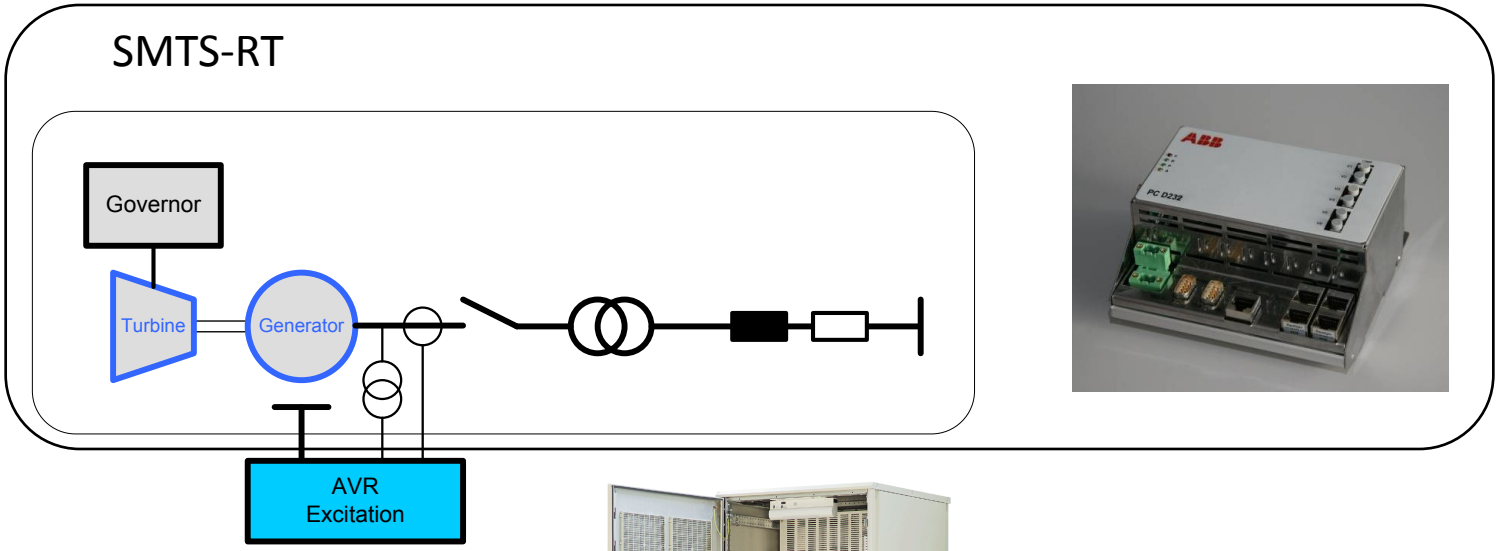


Real Time Simulation of

- Turbine and governor (simplified)
- Generator
- Breaker and step-up transformer
- Grid representation with infinite Bus Voltage

Synchronous Machine Transient Simulator

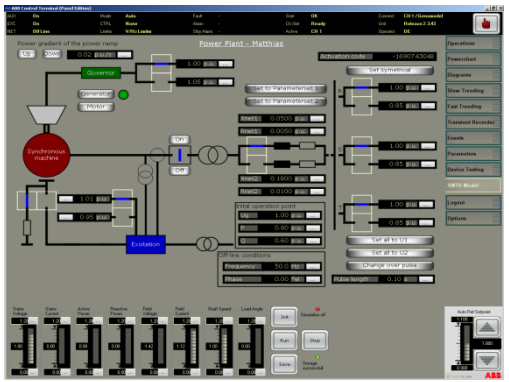
Turbine, Generator, Transformer, Line to infinite Grid



AVR hardware in the loop Real Time Simulation

Synchronous Machine Transient Simulator

Turbine, Generator, Transformer, Line to infinite Grid

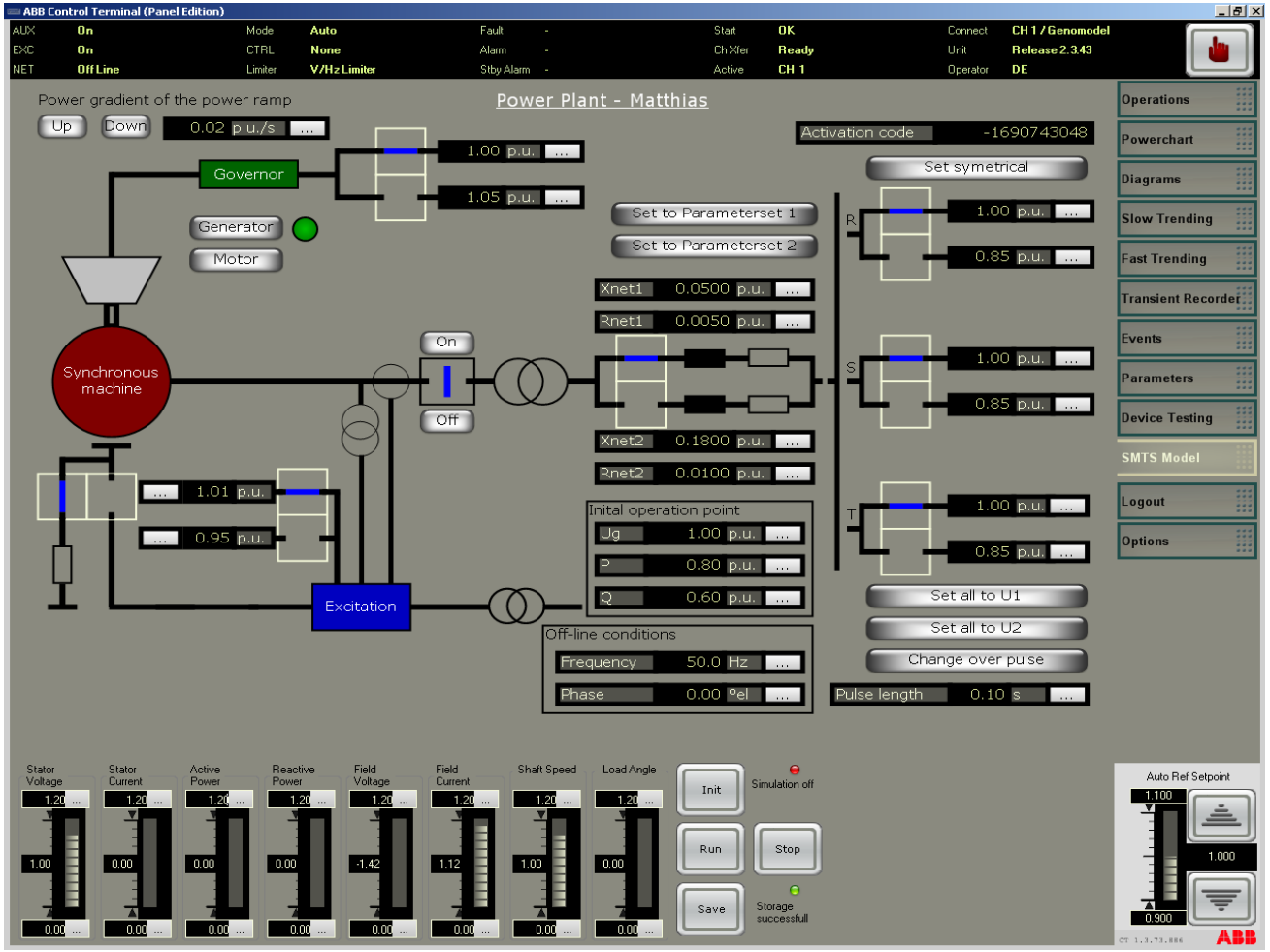


SMTS-RT 6000

UNITROL 6000

Synchronous Machine Transient Simulator

SMTS-RT 6000; User Interface



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AVR Grid Code Compliance

Grid Code Example

Excerpt from of a local grid code:

"*Overall Excitation System Control Characteristic*

…The frequency domain tuning of the Power System Stabilizer shall also be demonstrated by injecting a 0.2Hz-2Hz band limited random noise signal into the Automatic Voltage Regulator reference… while the Generating Unit is operating at a typical load level…

…The damping contribution of the Power System Stabilizer shall improve the system-stability within the frequency-band of interest (compared to the system response without a stabilizer):

i.e., 0.2Hz - 2Hz"