

# PSCAD™

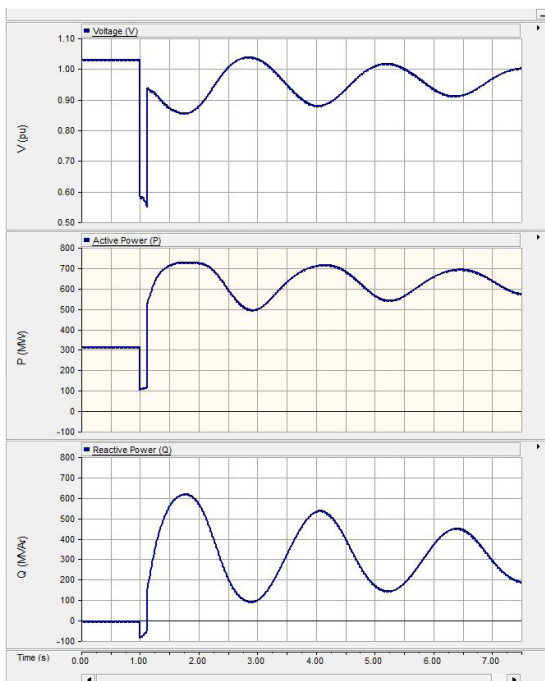
## Modeling Very Large Power Systems



PSCAD™/EMTDC™ software can simulate very large power systems consisting of dynamic devices, HVDC, FACTS, wind, solar PV, and other complex elements; as demonstrated with a transmission system of over 2,500 buses and 40 generator stations.

Parallel computing developments in PSCAD enable more efficient simulation of very large and complex networks. Systems that were previously too large and unwieldy can now be divided into smaller, interconnected sub-networks which may then be run in parallel, significantly reducing simulation time. This feature is termed Parallel Network Interface (PNI).

A representative version of a large Canadian transmission network is used to demonstrate the capability and to benchmark simulation performance.



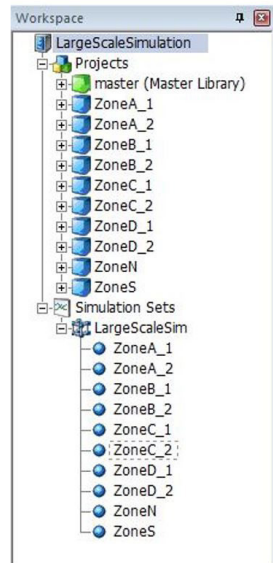
Simulation Waveform



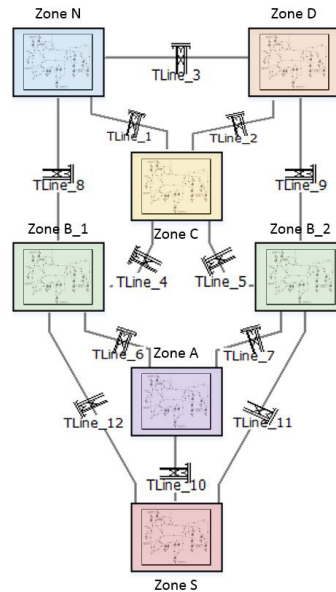
Large Canadian utility transmission network was used for demonstrating Parallel Network Interface



The network consists of over 2,500 buses and over 40 dynamic devices (generators and controls). The case runs over 12 cores on a regular Lenovo desktop computer. A five-second simulation that takes 2.5 hours when run serially on a single processor core, takes only 12 minutes when utilizing the PNI (12X faster!). The performance is further improved when simulated on dedicated, yet cost-effective hardware.



PSCAD Network Workspaces



Network Connected by Parallel EMT

## The applications of this feature include

- Wind and power electronic-based generation integration into weak grids
- VSC-HVDC and multi-infeed HVDC transmission schemes
- Studies of control interactions and resonance concerns

We invite all of our valued users to try out this exciting capability. We can help you to ready your large system cases for parallel simulation, and to select an efficient and effective hardware platform.

*Manitoba Hydro International Ltd. is a world leader in power system simulation innovation and applied engineering solutions. As the developers of the world-renowned PSCAD™/EMTDC™ software, we recognize the importance of collaborative partnerships and technologies in the global power industry.*

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