OPAL-RT TECHNOLOGIES SEMINAR

NEWCASTLE 2017 SYMPOSIUM ON MICROGRID

By Pierre-Francois Allaire & Simon Buchwald

OPAL·RT TECHNOLOGIES

CORPORATE OVERVIEW

Enabling visionaries around the world to turn their innovative ideas into reality

Since 1997, industries such as the power systems, power electronics, automotive, and aerospace are turning to OPAL-RT, making the company a world leader in real-time simulators and Hardware-in-the-Loop testing equipment for electrical, electro-mechanical and power electronics systems.

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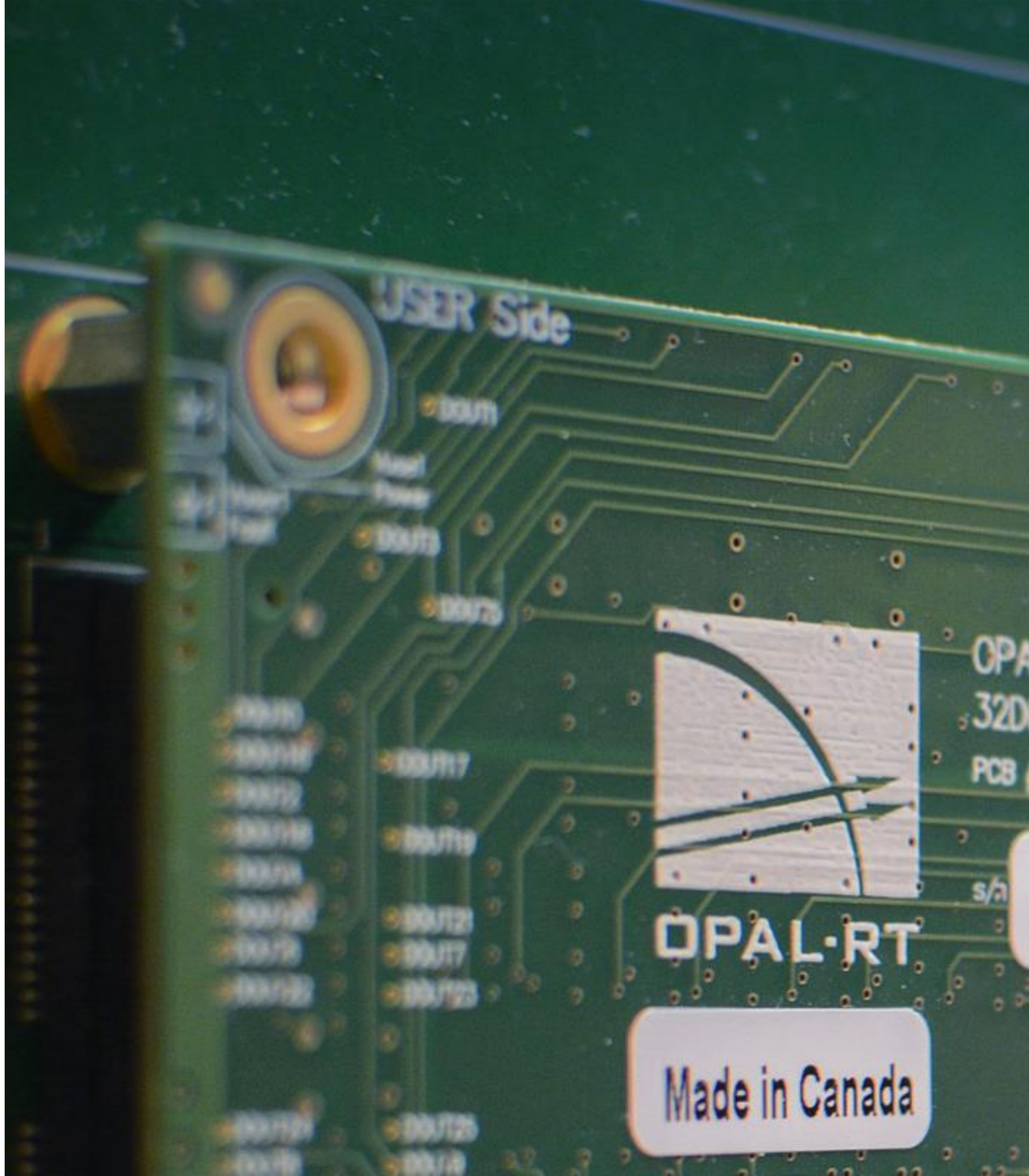


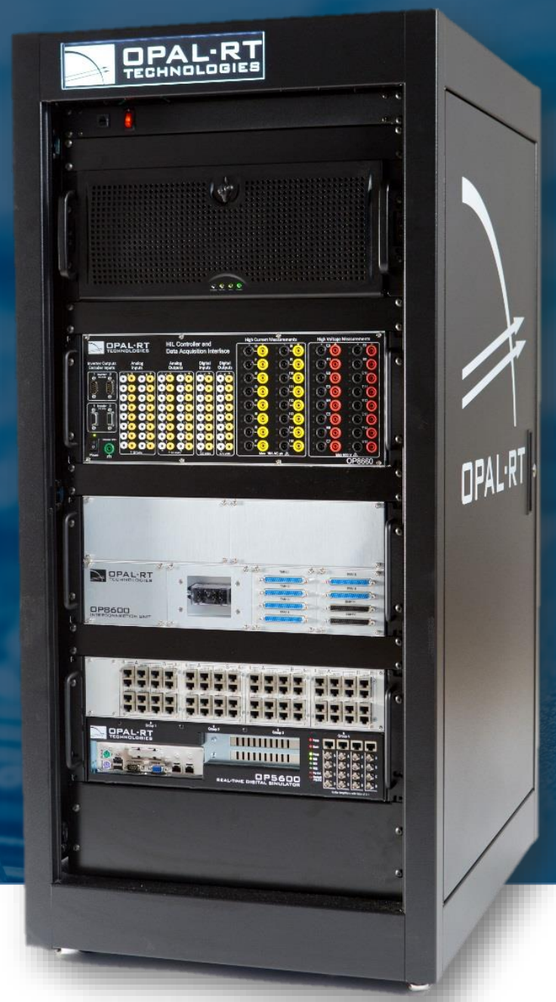
WHY USE AN OPAL-RT REAL-TIME SIMULATOR?

Open and Flexible Systems

- Combined expertise: power systems & power electronics
- Linux Red Hat based
- MATLAB/Simulink
- Support 3rd party software: Matlab/Simulink/SPS/PSSe/ PLECS/PSIM/FEA tools

Increased Cost Savings

- Simulation duration
- Time to market
- Safety and risk management



Surpass the Industry Standards

- Test fidelity
- Test Coverage

Your Partner of Choice

- Expertise
- Custom solution
- Integration and consulting services

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MAIN APPLICATIONS

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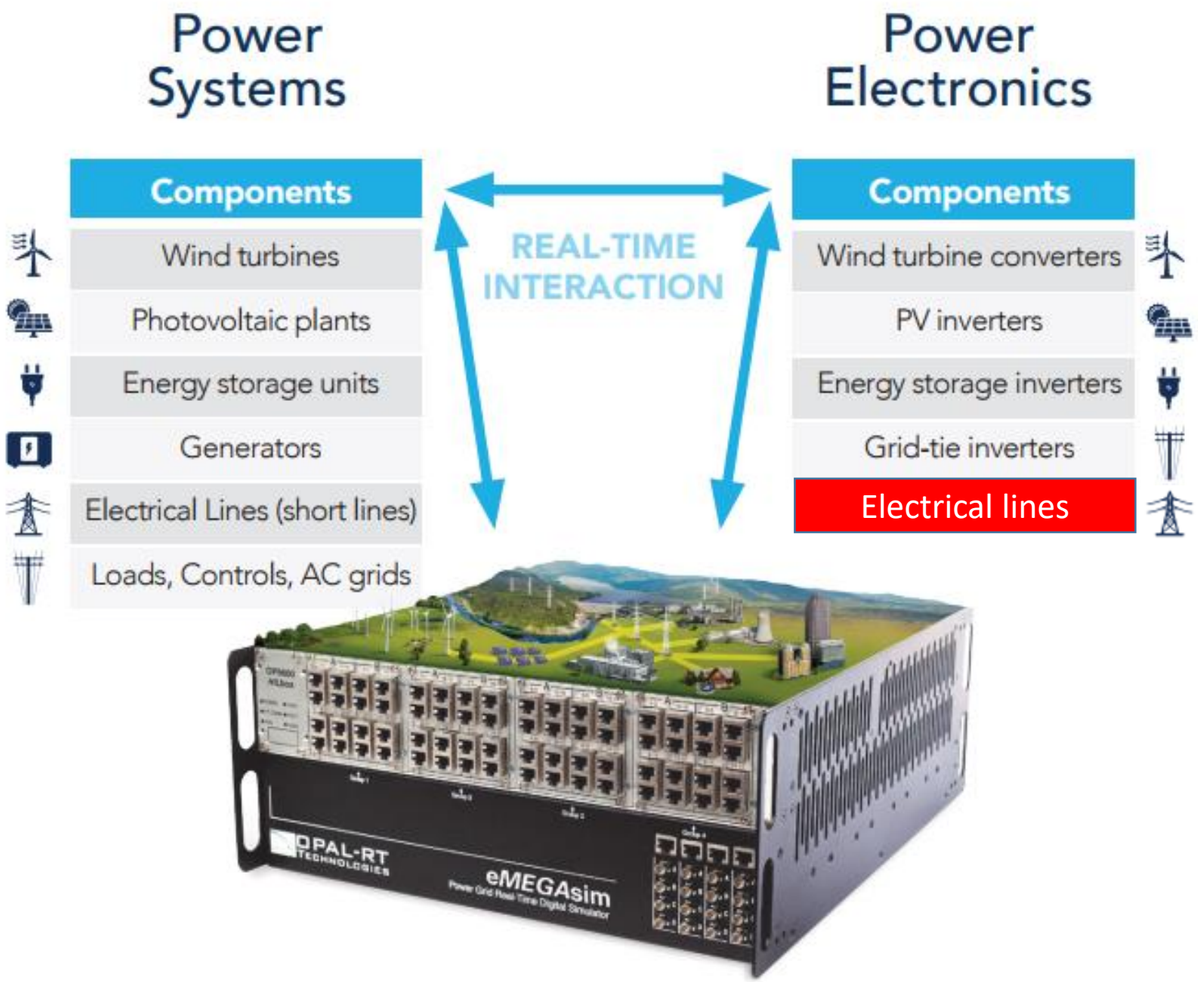
OPAL-RT MICROGRID SOLUTION IN BRIEF



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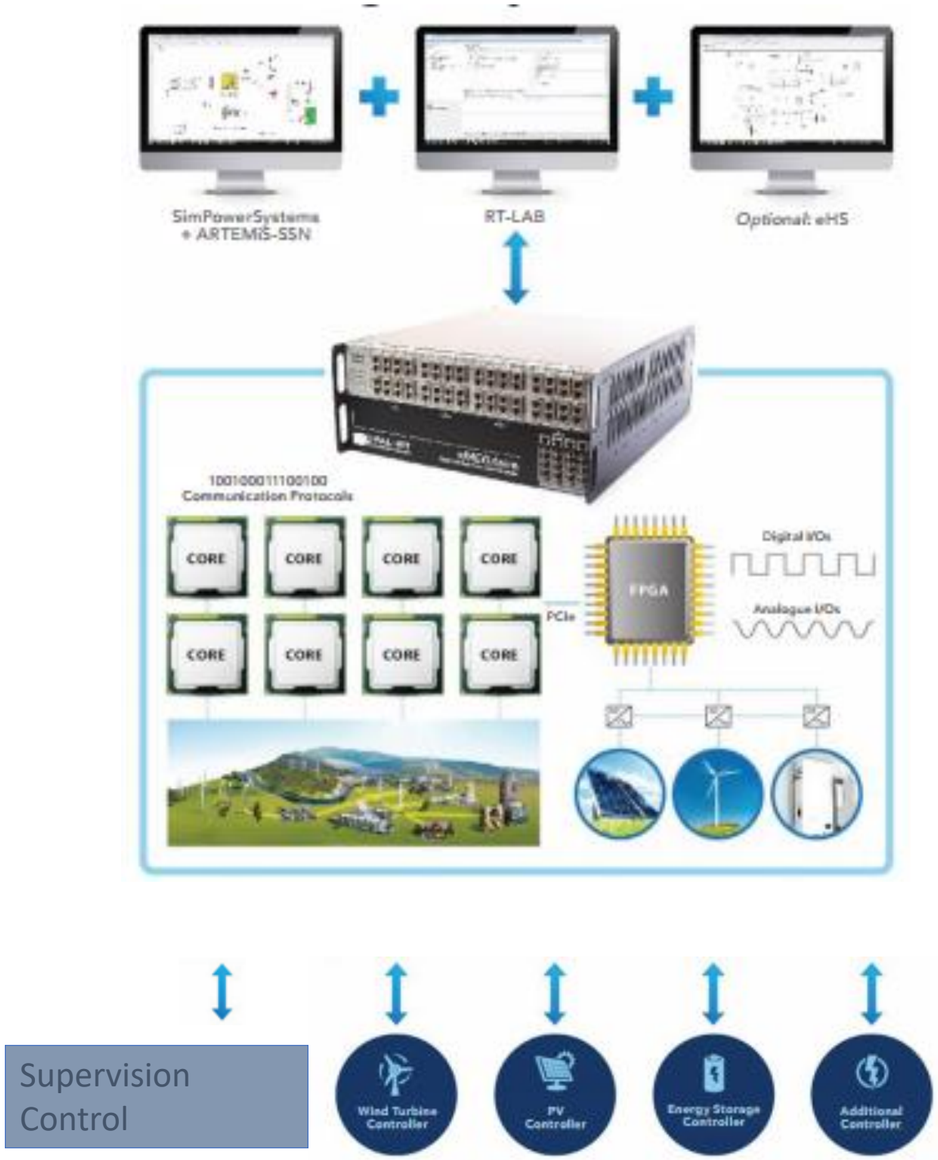
OPAL-RT MICROGRID SOLUTION IN BRIEF



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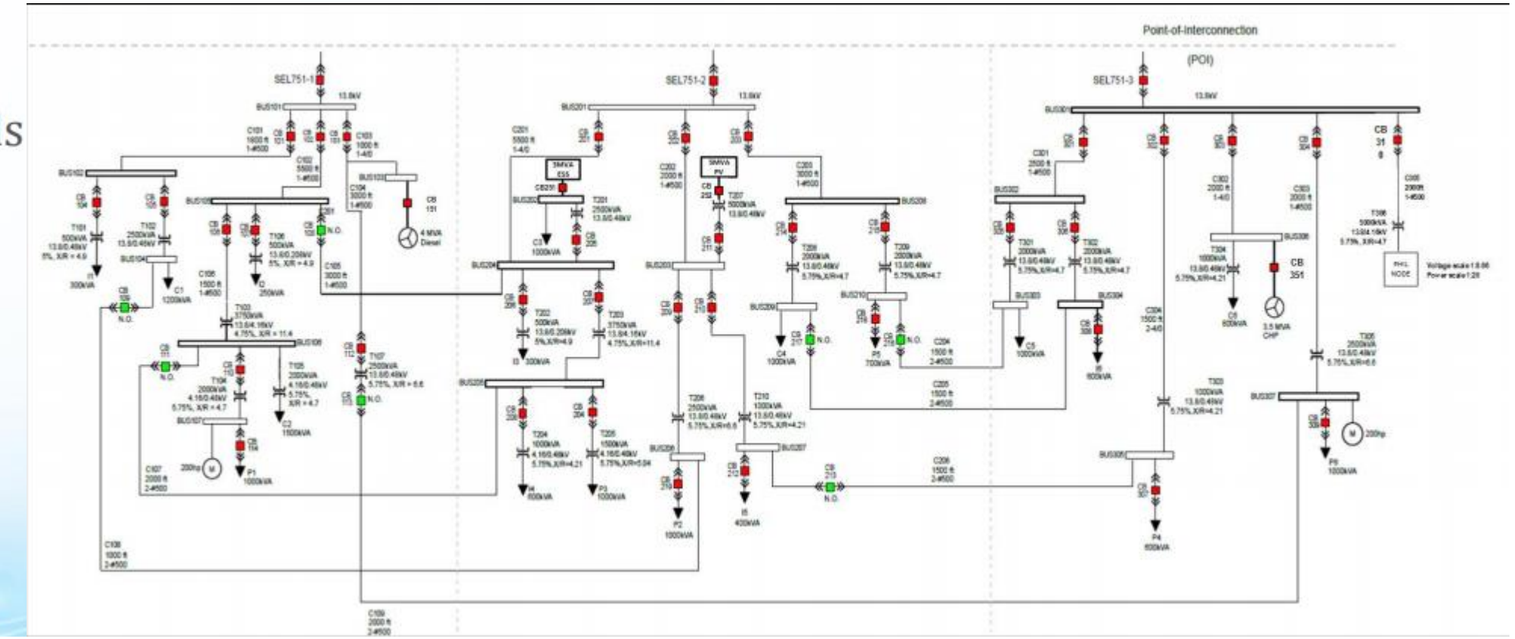
MICROGRID HIL & PHIL EXAMPLE

- Single phase nodes: 291x
- 3x Synchronous Generators with controls
- 2x ESS (VSI, Battery with controls)
- 2x PV (VSI with controls)
- 49x CB with Protective Relays
- 1x DMS interface
- OP6500 – 12 cores utilized to run 100µs

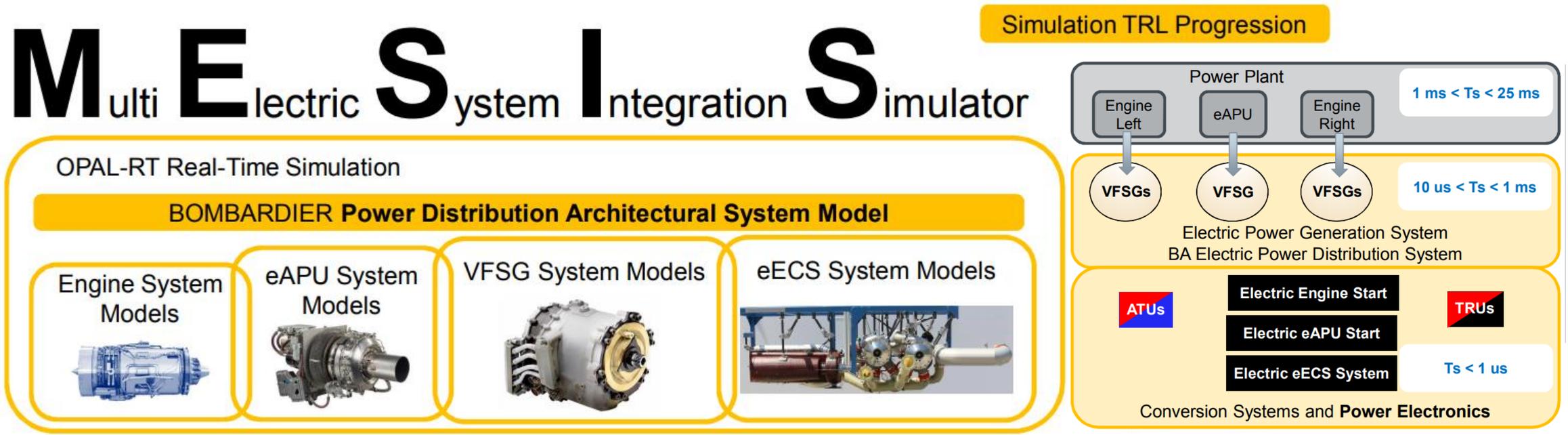


NREL analysis KPP (Key performances Parameters) such as:

- Resiliency and Reliability
- Operation and Maintenance
- Interconnection Contract
- Distribution Service Operator (DSO) Commands
- Power Quality
- Microgrid Survivability
- Fuel- Free Asset Utilization
- Economic operation

MICROGRID HIL EXAMPLE

BOMBARDIER



- Improve Aircraft Operational Cost efficiency by converting the conventional mechanical driving energy of designated aircraft system, into electrical driving system.
- Achieve Technology readiness systems components for flight testing

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https://www.opal-rt.com/resource-center/

Enabling Resilient Microgrid through programmable network

Author: Yanyuan Qin, Peter B. Luh, Peng Zhang, Lingyu Ren, Bing Wang, Ruofan Jin

Power Electronics Converters for Microgrids with Smart Grid Functionality

Author: Selie Galami

Fuse relay adaptive overcurrent protection scheme for microgrid with distributed generators

Author: Emilio C. Piesciorovsky, Noel N. Schulz

Performance Test of Coordinated Control of SMES and BESS in Microgrid using HIL Simulation System

Author: Hyeong-Jun Yoo, Hyeon-Kyun Ji, and Hak-Man Kim

Development of a Real-Time Hardware-in-the-Loop Power Systems Simulation Platform to Evaluate Commercial Microgrid Controllers

Author: R.O. Salcedo, J.K. Nowocin, C.L. Smith, R.P. Rekha, E.G. Corbett, E.R. Limpaecher, J.M. LaPenta

A New Current Limiting Strategy and Ffault Model to Improve Fault Ride-through Capability of Inverter Interfaced DERs in Autonomous Microgrids

Author: Hamid Reza Baghaee, Mojtaba Mirsalim, Gevork B. Gharehpetian, Heidar Ali Talebi

Research on Medium Voltage Battery Energy Storage System Based on RT-LAB

Author: Jianwei Wang, Xisheng Tang, Zhenggang Yin

https://github.com/PowerSystemsHIL/EPHCC

Collaborative model repersitory to share and download simulation models from mutliple vendors.


WEBINAR |
"Students-In-the-Loop": Teach and Learn with HIL
December 7, 2017 // 9AM EST
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THE OHIO STATE UNIVERSITY
UNSW SYDNEY