Advanced Grid Innovation Laboratory for Energy (AGILe)

RTS-based Communication Network Testbed for Synchrophasor Applications



A Program of the New York Power Authority

NYPA Overview – Generation/Transmission Assets



- Established by the NY State Legislature in 1931.
- Largest state public electric utility in the United States.
- Wholesale power supplier throughout New York State and neighboring states as required by law.
- Provides, with generation and power purchases, about 25% of New York State's electricity. No Distribution System
- Net Generation: 80% hydro; 20% gas/oil
- Transmission lines: 1,400+ circuit miles; 115kV, 230kV, 345kV & 765kV
- Non-profit energy corporation, does not use tax revenues or state credits, finances projects through bond sales and cash from operations



The Advanced Grid Innovation Laboratory for Energy (AGILe) Collaboratively enabling an affordable, reliable, low-carbon future



Bringing together **industry stakeholders** to evaluate integrated grid solutions for a clean energy future and **accelerate development and adoption of new technologies**



Advanced T&D Applications



Cybersecurity



Advanced Modeling and Simulation with Real-Time Hardware/Software-in-the-loop Capabilities



Power Electronic Controls



Grid Automation



Advanced Sensors



Current AGILe Capabilities



End-to-end grid modeling and real-time simulation



Hardware/software-in-the-loop equipment testing for digital substation automation and control



Simulation of communication systems and cyber security events



Economic analysis and evaluation of technical solutions



DRTS Co-simulation with Communication Network



Development of a RTS-Based Testbed for Synchrophasor Applications



Development of a RTS-Based Testbed for Synchrophasor Applications



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Capability for detailed modeling of NYPA and NYS grid to simulate a large variety of phenomena

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- Ability to model and cosimulate communication systems and cyber-security events evaluating their impact on grid applications
- Capability testing equipment and schemes in close-to-field conditions prior to field deployment
- De-risking synchrophasorbased wide-area monitoring, protection, and control systems



Use Case: Implementation and Testing of Wide Area Oscillation Damping Controller

- Collaborators •
 - EPRI, NYPA, TERNA, UTK
- Issue under study
 - Design and implement an adaptive, wide-area oscillations damping controller utilizing phasor measurement unit data and is capable of damping interarea low-frequency oscillations observed after disturbance events.
 - Performance demonstration both in the New York state and the Italian ٠ transmission grids.







WADC

With WADC



Discussion



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