ELECTRA REX

A Researcher Exchange Programme for Smart Grids

European Liaison on Electricity Committed Towards long-term Research Activity Integrated Research Programme

HARDWARE IN THE LOOP TESTING OF ELECTRA WEB OF CELLS ARCHITECTURE WITH DISTRIBUTED CONTROL UNDER A FREQUENCY EVENT.

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The Power Systems Group at Florida State University's (FSU's) Center for Advanced Power Systems (CAPS) facility hosts extensive electric power systems simulation capabilities utilized and supported by an experienced and highly skilled research team. This facility was optimal for testing distributed control algorithms such as the developed control within the ELECTRA IRP project and Strathclyde. ELECTRA IRP Researcher Exchange Programme has given the opportunity to bring together the expertise of CAPS and Strathclyde on electric power systems modeling and simulation, control systems and the emerging hardware-in-the-loop (HIL) concept for testing advance power and control systems.

The Smart-Grid Cyber-Physical Systems Testbed [1] was the ideal testbed for the prototyping and testing of a distributed control that was under development [2]. In this project, a Controller Hardware in the Loop (CHIL) simulation for a real-time distributed control algorithm concept developed within the ELECTRA IRP project is performed. The collaboration favored for a fast integration of the distributed control algorithm within the existing testbed along with a further development of simulated power system. As a result, this work presented some early data of the HIL simulation behavior of the distributed controller under a frequency event.

The development of the CHIL testing in this project will provide a starting point for an implementation of a distributed frequency control scenario in the WoC architecture on a Power Hardware in the Loop (P-HIL) simulation were real devices could be directly controlled instead of simulated in real-time.

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REFERENCES

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