Architecture Development and Implementation of a Synchrophasor-based Real-time oscillation damping Control System

Eldrich Rebello
Department of Electrical Engineering and Automation
Aalto University
Espoo, Finland
Email: eldrich.rebello@aalto.fi

Homer Simpson
Kungliga Tekniska högskolan
Stockholm, Sweden
Email: luigiv@kth.se

Md. Shoaib Almas
Kungliga Tekniska högskolan
Stockholm, Sweden
Email: msalmas@kth.se

***Abstract*—The modern power grid is increasingly being used under operating conditions of increasing stress for which it was not designed. The increasing penetration levels of variable energy sources such as wind present significant grid stability issues. One of these stability issues is the phenomenon of low frequency, electro-mechanically induced, inter-area oscillations. Simulations have demonstrated the potential of Wide Area Measurement Signals (WAMS)-based Power Oscillation Damping (POD) in achieving improved electromechanical mode damping compared to traditional, local signal based, Power System Stabilizers (PSS). This paper takes an established Phasor-based oscillation damping algorithm and combines it with modern PMU technology to implement a hardware prototype of a real-time oscillation damping control system using remote PMU signals sent over a communications network. The developed prototype is tested in real-time using a Hardware-in-the-loop approach in conjunction with the Klein-Rogers-Kundur two-area four-machine test system and is demonstrated to have applications independent of the controlled device.**

I. Introduction

This demo file is intended to serve as a "starter file" for IEEE conference papers produced under LaTeX using IEEEtran.cls version 1.8 and later. I wish you the best of success.

mds

December 27, 2012

A. Subsection Heading Here

Subsection text here.

1) Subsubsection Heading Here: Subsubsection text here.

II. Conclusion

The conclusion goes here.

Acknowledgment

The authors would like to thank...

References

[1] H. Kopka and P. W. Daly, *A Guide to LaTeX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.