

## DAMPING FUNCTION OF GUPFC BASED ON PHILLIPS-HEFFRON MODEL

Author(s): **Hasan Rafiq<sup>1</sup>, Yasir Saleem<sup>2</sup>**

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### **Abstract:**

Flexible alternating current transmission systems (FACTS) devices have been in use over several decades. They have been developed to overcome the issues of transmission line losses, power system transients, voltage stability issues and installation of new transmission lines. In recent years (due to the increase in population, housing societies and industries), the need of providing new transmission lines has increased in order to fulfil the electricity demands. However, erection of new transmission line is not only costly but also creates environmental problems. To overcome this problem, FACTS device, such as unified power flow controller (UPFC), have been used which regulates the power flow on a single transmission line and controls line voltage to minimize the line losses. This paper presents the design of damping function of fourth generation FACTS device named as generalized UPFC (GUPFC). Design of GUPFC controller is based on linearized Phillip-Heffron model for damping the power oscillations. Damping function of GUPFC and control input for proposed damping controller have been investigated. GUPFC damps the power oscillations when installed in a single machine infinite bus (SMIB). It also has high damping characteristics as compared to UPFC damping controller.

### **For full paper, contact:**

**Prof Muhammad Masood Rafi**

Editor-in-Chief, NED University Journal of Research

Ph: +92 (21) 99261261-8 Ext:2413; Fax: +92 (21) 99261255

Email: [NED-Journal@neduet.edu.pk](mailto:NED-Journal@neduet.edu.pk)

Website: <http://www.neduet.edu.pk/NED-Journal>

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<sup>1</sup> Lecturer, University of Lahore, Pakistan, Ph. +92 (0)322 8816000, Email: [Hassan.rafiq182@gmail.com](mailto:Hassan.rafiq182@gmail.com).

<sup>2</sup> Associate Professor, University of Engineering and Technology, Lahore, Pakistan, Ph. +92 (0)42 99029260, Email: [ysaleem@gmail.com](mailto:ysaleem@gmail.com).