

**IMPLEMENTATION OF UNIFIED POWER FLOW  
CONTROLLER (UPFC) IN POWER TRANSMISSION  
SYSTEM**

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## **ABSTRACT**

This paper presents the Flexible AC Transmission System (FACTS) is a system designed to improve performance of voltage instability or collapse and loss minimization of the power transmission network. The Unified Power Flow Controller (UPFC), a type of FACTS device was implemented into power transmission line and the mathematical model of UPFC was tested by Matlab software. This paper indicates analyzing of the power flow and the relative losses has been effectively. Validation process involved the implementation of UPFC into IEEE-6 Bus system.

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# CHAPTER 1

## INTRODUCTION

### 1.1 BACKGROUND OF THE PROJECT

Power system stability has been recognized as an important problem for secure system operation since the 1920s. Power system stability is the ability of an electric power system, for a given initial operating condition, to regain a state of operating equilibrium after being subjected to a physical disturbance, with most system variables bounded so that practically the entire system remains intact. Many major blackouts caused by power system instability have illustrated the importance of this phenomenon. Uncontrollable decay of system voltage at one or more load buses or even over a significant portion of power network as a response to load variations, generation or structure disturbances and etceteras has been observed in power systems worldwide. This has been termed as voltage instability and the process of voltage decrease has been termed as a voltage collapse process historically, transient instability has been the dominant stability problem on most systems and has been the focus of much of the industry's attention concerning system stability. Voltage instability is a common issue in transmission line system. This issue has cause short and long term problem to both the consumers and energy providers [1].