

COMPARISON OF CURRENT CONTROL METHODS ON CARRIER BASED VSI-PWM INVERTER DRIVES FROM LINE POWER QUALITY ASPECT

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Abstrak

Paper ini mengetengahkan hasil simulasi dari dua metode pengaturan arus untuk inverter jenis sumber tegangan dengan modulasi lebar pulsa (VSI-PWM) yaitu metode kendali arus hysteresis dan ramp comparison. Simulasi ini berguna dalam pemilihan metode pengaturan arus pada adjustable speed drives (ASD) dan secara umum untuk konverter daya elektrik dari sudut pandang kualitas daya. Hasil simulasi menunjukkan bahwa kedua metode control memberikan karakteristik kualitas daya yang berbeda pada tegangan maupun dan arus inputnya. Metode ramp comparison memberikan efek distorsi yang lebih rendah pada arus input dibandingkan metode hysteresis. Sebaliknya, untuk distorsi tegangan, hysteresis current control menunjukkan performa yang lebih baik..

Kata kunci: *distorsi, hysteresis current control, ramp comparison current control*

Abstract

This paper describes simulation result of two methods in current controlling for carrier based VSI-PWM inverter: hysteresis and ramp comparison control. The simulation useful in selection of ASDs and generally-converter, from power quality point of view. Simulation result show that both ramp comparison and hysteresis control methods gives difference characteristic on line voltage and line current. A ramp comparison method is better in form of lower effect on line current distortion compare with hysteresis control method. Meanwhile, for line voltage distortion, hysteresis control seen better.

Keywords: *distortion, hysteresis and ramp comparison current control*

1. INTRODUCTION

Motivated by various factor such as energy efficiency, performance and flexibility of operation ASDs shows increase trend of application in widely area. This trend is predicted to continue by supported of technology achievement especially in control and power electronics as a part of the drive system. Meanwhile, along with widely ASDs application, negative impact produced to power quality is also increase.

The current contains harmonics created by switching operation of static switch in ASDs cause voltage disturbance on point of ASDs Supply is also distorted, the higher of current harmonics the higher voltage distorted on that point. Further, this voltage harmonics spreads and influences to other part of power network and gives various negative impact to equipment that build the system [1],[2].

Basically, the ASDs is aimed to regulate two main mechanical quantities as output of drive system then transmitted to load drives, i.e. angular speed and torque. Speed related to stator frequency meanwhile torque is directly related to stator current. The role of current regulator is taken by current controller which varying current quantity related to torque needed