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## ข้อความแห่งการริเริ่ม

- 1) วิทยานิพนธ์นี้ได้นำเสนอวิธีการใช้เทคนิคสัญญาณพาหะพัลส์วิดมอดูเลชัน PWM (CBPWM) สำหรับการสร้างเครื่องกำเนิดสัญญาณแรงดันไฟฟ้าตกชั่วขณะ 3 เฟส 4 สายควบคุมโดยไมโครคอนโทรลเลอร์ โดยอุปกรณ์ฮาร์ดแวร์ราคาถูก เขียนโปรแกรมในการควบคุมได้ง่าย จากการสร้างด้วยเทคนิค CBPWM จึงทำให้สามารถเพิ่มอัลกอริทึมสัญญาณแรงดันไฟฟ้าตกชั่วขณะ เพื่อให้เหมาะสมกับงานพัฒนา งานวิจัย ทดสอบอุปกรณ์เพื่อความคงทนต่อแรงดันไฟฟ้าตกชั่วขณะได้
- 2) มีความเหมาะสมสำหรับนำไปทดสอบในห้องปฏิบัติการเพื่อประเมินประสิทธิภาพของอุปกรณ์ไฟฟ้าภายใต้เงื่อนไข แรงดันไฟฟ้าตกชั่วขณะทั้ง 7 ชนิด (อุปกรณ์ไฟฟ้าทดสอบเครื่องชดเชยแรงดันไฟฟ้าตกชั่วขณะ หรือคุณภาพทางไฟฟ้า) และเครื่องอินเวอร์เตอร์ที่สร้างมีค่า THDv 3.9% ซึ่งต่ำกว่าเกณฑ์มาตรฐานคุณภาพไฟฟ้า
- 3) เครื่องสร้างสัญญาณแรงดันไฟฟ้าตกสามารถควบคุมการเกิดแรงดันไฟฟ้าตกชั่วขณะ ณ มุมใดๆ ในรูปคลื่นแรงดันไซน์ได้
- 4) สามารถทดสอบอุปกรณ์ไฟฟ้าในสถานะแรงดันไฟฟ้าตกชั่วขณะแบบสมดุล/ไม่สมดุลได้ ทดสอบกับภาระโหลดทางไฟฟ้าชนิดความต้านทาน ชนิดตัวเหนี่ยวนำ อุปกรณ์ส่องสว่าง UPS และการเลื่อนเฟส โดยทดสอบภายใต้มาตรฐานสากล IEC61000-4-11 และ SEMI F47

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## STATEMENTS OF ORIGINALITY

1. This thesis presents an implementation of a carrier-based PWM (CBPWM) technique for 3-phase 4-wire voltage sags generator (VSG) with microcontroller. This research add simple sag algorithm to CBPWM technique it's very simple design, devices and parts low-cost and can be easily develop and operate hardware structure than other topology. The proposed CBPWM technique can be implemented with dsPIC30F a low cost microcontroller.
2. The VSG it is suitable for most R&D and test labs to evaluate the performance of electrical equipment under 7 sags types conditions (equipment under test: EUT or a sag-compensating power quality conditioner)
3. The VSG can control voltage sag at any point on wave on sine wave
4. The VSG tested equipment with balanced/unbalanced load, resistive loads (Tungsten Lamp) and inductive loads, phase shift. The proposed method provides an effective method based on IEC61000-4-11 and SEMI F47 International standard

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