

DESIGN OF THE 32-KV IMPULSE GENERATOR

(การออกแบบและสร้างอิมพัลส์เจนเนอเรเตอร์ขนาด ๓๒ กิโลโวลต์)

by

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ABSTRACT

This thesis presents the design of a 32-KV impulse generator. The generator is built up to 4 multi-stage capacitors of the Marx principle; to which all the stage capacitors (each 0.1 μF capacitance) can be charged in parallel to 10 KV direct voltage with a charging equipment of the voltage doubler circuit type, then automatically discharged in series, giving a discharged capacitance of 0.025 μF and an energy of discharge of 6.6 W-seconds at the maximum output impulse voltage of 23 KV.

In dealing with the impulse circuit problems, the operational calculus and the graphical method are presented with the calculated data for the standard wave shapes of the I.E.C. rule. The methods and techniques of measuring the impulse voltages, and comparison of the experimental data to the calculated data for the standard wave shapes and the wave shapes effected by the circuit elements and loads are included in this thesis.

This generator may be used as a guidance work for further study of the impulse voltages, and may be used to test any low voltage insulation.

เรื่อง : การออกแบบและสร้าง Impulse generator ขนาด 32 กิโลโวลต์
 ผู้เขียน : นายวิฑูรย์ เกวลกุล
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บทคัดย่อ

วิทยานิพนธ์ฉบับนี้ ได้แสดงการออกแบบและสร้าง Impulse generator ขนาด 32 กิโลโวลต์ Generator ที่สร้างเป็นแบบ multi-stages ตามหลักของ Marx ซึ่งประกอบด้วย capacitors 4 ตัว โดยมีค่า capacitance ตัวละ 0.1 ไมโครฟาร์ัด Capacitors เหล่านี้สามารถอัดประจุด้วยไฟกระแสตรงขนาด 10 กิโลโวลต์ จากเครื่องอัดประจุไฟกระแสตรง (D-C charging voltage equipment) ชนิด voltage doubler circuit แล้วจะคายประจุของตัวเองโดยอัตโนมัติให้ค่า discharged capacitance 0.025 ไมโครฟาร์ัดและพลังงาน 6.6 วัตต์ - วินาที ที่ maximum output impulse voltage 23 กิโลโวลต์

ในงานนี้ ได้แสดงทั้งวิธีคำนวณและวิธีกราฟ พร้อมทั้งข้อมูลจากผลการคำนวณของ Standard waves ตามกฎ I.C.C. ส่วนวิธีการและเทคนิคในการวัดค่า impulse voltages. และผลเปรียบเทียบระหว่างข้อมูลจากการทดลองกับข้อมูลจากการคำนวณของ standard waves รวมทั้ง waves ที่เปลี่ยนแปลงไปตามค่าของ circuit elements หรือเปลี่ยนแปลงไปตามค่าของ capacitive loads ก็ได้แสดงรวมไว้ในวิทยานิพนธ์เล่มนี้

Impulse generator เครื่องนี้ อาจใช้เป็นแนวทางในการศึกษารายละเอียดของ impulse voltages และยังสามารถทดสอบฉนวนไฟฟ้าต่าง ๆ ได้ด้วย

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