HV AWG

Publieke samenvatting / Public summary

Aanleiding

With large scale integration of renewable energy resources a future power electronics (PE) rich grid is expected. The harmonics and transients produced by PE can influence the lifetime and reliability of the power system components. A high voltage arbitrary waveform generator (HV-AWG) capable of generating similar type of dielectric stress produced by PE is necessary to test power components of the future flexible electric grid.

Doelstelling

The goal is to design and construct a PE based HV-AWG for medium voltage equipment testing. This is to assess and ensure long term reliability of the medium voltage components exposed to high level of harmonics and transient created by PE present in a flexible future electric grid.

Korte omschrijving

WP1: Specification and topology choice. Most suitable topology will be chosen based on bandwidth, complexity of HV design and control system, cost and size of the generator WP2: Sub-module design Design of the main switching board, power supply of the board, fast gate driver, communication hardware, switch operation under high pulse current, etc. WP3: Main power supply design. Based on the topology chosen, isolated HV high frequency transformers or variable voltage DC power supply will be designed and constructed. WP4: Control and communication system Choice of the controller, configuration of control system, communication media, complexity, speed and stability of the control algorithm. WP5: Structure

Projectinformatie / Project information

Projectnummer / Project number
TKITOE1821403
Subsidiebedrag / Grant amount
€ 359.608,00

Algemene informatie / General information

Penvoerder / Secretariat
TUD

Publicaties en materialen / Publications and attachments

- **19.02.2024**

  1821403 HV AWG - Eindrapport

- **19.02.2024**

  1821403 HV AWG - Schematic

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design Structural design, considerations for electromagnetic shielding and operation of oil-immersed power electronics circuit used in the test generator. WP6: Prototyping and testing To demonstration the proof of concept, five stages of the test generator will be prototyped and tested. The goal is to create stages/connections that are designed for full scale test generator.

Resultaat
Enabling adequate and rigorous testing to increase reliability of power components installed in the future power electronics rich (polluted) grid, by means of a modular HV-AWG suitable for testing existing and new medium voltage class equipment. A design guideline and a scaled down demonstrator of the test generator and control algorithms will be built and tested.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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