S4-O-002801

SURGE OF A HIGH-VOLTAGE PULSE IN THE TRIGGER SYSTEM OF A PSEUDOSPARK SWITCH DURING COMMUTATION*

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High-current gas discharge commutators have always been of a keen interest in various fields of applications. Especial niche here have been occupied by cold cathode thyratrons, also known as pseudo-spark switches [1]. These devices showed exceptional triggering characteristics such as low jitter and low delay time to triggering along with a capability to commutate high currents up to several kA's at high anode voltage at a level of 40 kV and above [2].

Previously it has been shown that the trigger system is a crucial part, responsible for stability of triggering of the thyratrons [3]. To provide a nanosecond stability of triggering, it is necessary to achieve a stable formation of the pulse trigger discharge, which ignites in the trigger unit [3, 4]. Due to numerous trials and research, an optimal trigger unit of the thyratron has been developed [5, 6]. The new trigger unit provides a stable formation of the trigger discharge thus delivers a stable triggering of the switch.

There is a dark side of the new trigger unit. It generates a dense plasma during triggering and this plasma conducts a high electric potential from the anode into the trigger unit cavity, delivering a pulse of high voltage into the trigger system when triggering. This drawback may bring undesirable consequences in some sensitive applications.

In this work, we investigate opportunities to eliminate the high-voltage pulse, emerging in the trigger system during triggering of the thyratron. Different approaches have been applied toward investigation of the high-voltage pulse.

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* This work was funded by RFBR according to the research project № 19-08-00326a