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ORGANIZATION OF A BOOST CHANNEL IN THE STRUCTURE OF A RENEWABLE DC ENERGY SOURCE

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Abstract

The instability of the work of renewable energy sources (RES), which is caused by a change in meteorological conditions, requires appropriate adjustment of the output voltage. One of the options for implementing this adjustment is to organize a boost channel, which is proposed to be performed on the basis of a semiconductor energy converter, the transformer-and-switches executive structures (TSES) of which consists of a transformer with a partitioned secondary winding and a multi-level rectifier. This TSES through discrete-time control of key elements implements the necessary purposeful change in the level of output voltage. The set of constant functioning states (voltage transfer coefficients) of the TSES is analyzed and the appropriate transition options between them are determined. The high efficiency of the use of switches elements in this TSES and low total losses on semiconductor devices are substantiated. References 6, figures 2, table 1.

Key words: renewable energy source, boost channel, voltage converter, transformer-and-switches executive structure, winding section, multi-level rectifier.

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References

1. Statistics Time Series.
URL: <https://www.irena.org/Statistics/View-Data-by-Topic/Capacity-and-Generation/Statistics-Time-Series> (acsessed 25.01.2020)
2. Kyrylenko O.V., Pavlovsky V.V., Lukanenko L.M., Trach I.V. Problems of integration of renewable energy sources into weak electric grids. *Tekhnichna Electrodynamika*. 2012. No 5. Pp. 25-26. (Ukr)
3. Allan David Crane, Warren Mark Blewi . Power converters. US Patent 9800161B2. Oct. 27, 2017.
4. Lypkovskyi K.A. Transformer-and-Switches Executive Structures of Alternating Current Voltage Converters. Kiev: Naukova Dumka, 1983. 216 p. (Rus).
5. Bimal, K Bose. Power Electronics – Why the Field is so Exciting. *IEEE Power Electronics Society Newsletter* . 2007. Vol. 19.No 4. Pp. 11-20.
6. Lypkovskyi K.A., Ozerianskyi A.A., Gradoblianskyi V.M. Features of the construction of transformer-thyristor regulators of rectified voltage. Methods and means of converting electrical energy parameters. Kiev: Naukova Dumka, 1977. Pp. 24-28.

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