

DOI: <https://doi.org/10.15407/techned2017.05.047>

FEATURES OF THE RECONFIGURATION OF THE TRANSFORMER-AND-SWITCHES EXECUTIVE STRUCTURE OF THE STABILIZER-AC VOLTAGE REGULATOR

Journal	Tekhnichna elektrodynamika
Publisher	Institute of Electrodynamics National Academy of Sciences of Ukraine
ISSN	1607-7970 (print), 2218-1903 (online)
Issue	No 5, 2017 (September/October)
Pages	47 – 52

Author

K.O. Lypkivskyi*

Institute of Electrodynamics National Academy of Sciences of Ukraine,
pr. Peremohy, 56, Kyiv, 03057, Ukraine,
e-mail: lypkivskyk@ukr.net

* ORCID ID : <http://orcid.org/0000-0002-3292-1360>

Abstract

Transforming elements with sectioning of windings are components of transformer-and-switches executive structures (TSES) of AC voltage converters, to which are inherent in the multivariance of circuit and algorithmic solutions. The basic TSES of stabilizer with regulation of the stabilized voltage level is proposed. Reconfiguration of this structure allows to purposefully change the limits of regulation of these levels. Several variants of such reconfiguration are considered. The expedient law of sectioning the turns of the TSES autotransformer is determined, which does not change during reconfiguration. Also, the algorithm of discrete-time control of switch elements remains unchanged. References 10, figures 4, table 1.

Key words: transforming element, sectionalized winding, tap changing transformer, transformer-and-switches executive structure, voltage stabilizer, level control, discrete-time control.

Received: 17.05.2017

Accepted: 26.05.2017

Published: 17.08.2017

References

1. Glossary of electrical terms. Available at: <http://chillers.ru/glossary/electro.php> (accessed 16.05.2017).
2. Lypkivskyi K.O., Mozharovskyi A.G. Simulation of the transformative elements with sectioning of the windings as part of AC voltage source converters. *Tekhnichna Elektrodynamika* . 2016. No 3. Pp. 39–44. (Ukr)
3. Lypkivskyi K.O., Mozharovskyi A.G. Implementation features of the transfer function of the transformer-and-switches executive structure of the AC voltage regulator-stabilizer. *Tekhnichna Elektrodynamika* . 2017. No 2. Pp. 35–39. (Ukr)
4. Lypkivskyi K.O. 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 Fourth Quarter* . 2007. Vol. 19. No 4. Pp. 11–20.
6. Electronic Tap Switching Voltage Regulator. Available at: <http://www.ustpower.com/comparing-automatic-voltage-regulation-technologies/avr-guide-electronic-tap-switching-voltage-regulator/> (accessed 16.05.2017).

7. Huang M., Dong L., Zhang J., Wang J., Hao Z. Research on the Differential Protection Algorithm of Multi-Tap Special Transformer. *Journal of Power and Energy Engineering*. 2014. Vol. 2. No 9. P. 98. DOI: <https://doi.org/10.4236/jpee.2014.29014>
8. James W. Kronberg. Digitally-controlled AC voltage stabilizer, US Patent 6417651 B1, G05F1/14, 2002.
9. Ram G., Prasanth V., Bauer P., Bärthlein, E.M. Comparative analysis of on-load tap changing (OLTC) transformer topologies. 16th International Conf. IEEE *Power Electronics and Motion Control Conference and Exposition* (PEMC), 21-24 Sep.2014, Antalya, Turkey. Pp. 918–923.
10. Willems W., Vandoorn T.L., De Kooning, J.D., Vandevelde L. Development of a smart transformer to control the power exchange of a microgrid. IEEE PES ISGT Europe 2013. IEEE, 2013. Pp. 1–5.

[PDF](#)