

Interdependence between the harmonics of the output and input currents to a three phase rectifier bridge

Mitică Iustinian NEACĂ
Faculty of Electrical Engineering/I.E.E.A. Department
University of Craiova
Craiova, Romania
ineaca@elth.ucv.ro

Abstract — A large number of scientific papers published recently have as their study object the emergence of voltage and current harmonics and their limitation through various methods or devices [1-9]. At modern power stations equipped with static converters, the existence of these harmonics is inevitable, because these types of high power electronic assemblies are known as deforming elements. The present article is proposing to show the way how the deforming regime, which affects the current at the output of a three-phased bridge rectifier, influences the current, absorbed by the rectifier from the supply, inducing a nonsinusoidal regime in the connection point of the supply.

Keywords — bridge rectifier, deforming regime, harmonics influence

REFERENCES

- [1] M.H.Rashid, Power Electronics Handbook, Academic Press-Elsevier, United States of America, 2007, ISBN 13: 978-0-12-088479-7.
- [2] F.L.Luo, H.Ye, M.Rashid, Digital Power Electronics and Applications, Elsevier Academic Press, United States of America, 2005, ISBN: 0-1208-8757-6.
- [3] S.K.Purushothaman, An Optimized Solution of Elimination of Harmonics Using Resultant Theory, International Journal of Latest Research in Science and Technology, Volume 2, Issue 6: pp.102-106, November-December 2013, ISSN (Online):2278-5299.
- [4] M.Grötzbach, G.Vogel, Oberschwingungen im Netzstrom von Drehstrombrückenschaltungen bei welligem Gleichstrom und variabler Gegenspannung; etzArchiv 8 (1986) H.12.
- [5] L.Pierrat, Y.J.Wang, R.Feuillet, An Analytical Method for Predicting Current Harmonics Produced by an AC/DC Converter under Unbalanced Supply Voltage; ETEP Vol.2, No.4, July/August 1992.
- [6] M.A.Mahar, M.A.Uquaili, A.S.Larik, Harmonic Analysis of AC-DC Topologies and their Impacts on Power Systems, Mehran University Research Journal of Engineering & Technology, volume 30, no. 1, January, (2011) [ISSN 0254-7821].
- [7] F.Zare, H.Soltani, D.Kumar, P.Davari, H.A.M.Delpino, F.Blaabjerg, Harmonic Emissions of Three-Phase Diode Rectifiers in Distribution Networks, IEEE Access, volume 5, Special section on power quality and harmonics issues of future and smart grids, (2017), pp.2819-2833.
- [8] A.B.Yıldız, E.U.Aglar, Harmonic modeling of full-wave diode rectifier for nonuniform load currents, Journal of Microelectronics, Electronic Components and Materials, Vol. 44, No. 4 (2014), pp.288-295.
- [9] K.Jeji, CH. Sujatha, Three-Phase Diode Rectifier with Active Current Modulation and High Efficiency, International Journal of Computer Science and Technology, Vol.3, Issue 1, Jan. - March 2012, ISSN: 2229- 4333, pp.302-306.
- [10] A.Kloss, Oberschwingungen, Techn.Akad.Wuppertal, Berlin/Offenbach, vde-verlag, 1989.
- [11] M.I.Neacă, Regimul deformant al convertoarelor statice, SITECH, Craiova, 2009, ISBN: 978-606-530-187-0.
- [12] I.Neacă, Harmonic Regime of Load Current through Three-Phase Bridge Rectifier, Proceedings of the International Conference on Applied and Theoretical Electricity and Symposium on Cryoelectrotechnics and Cryogenics, ICATE 2000 – SCC 7, Craiova, 2000.