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Power Quality and Electromagnetic Interference in a Trolleybus Traction System

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Abstract

This paper presents an analysis of the power quality impact and electromagnetic interference in a trolleybus traction system. As test subject it is used a 180 kW induction motor supplied by a three phased inverter with field oriented control. A fast Fourier transform was used in a simulation process, to determine the power quality and electromagnetic interference processes of the current supplied to the motor.

References

1. A. Steimel, "Electric Traction – Motive Power and Energy Supply" in Deutscher Industrieverlag GmbH, November 2014.
2. Il. Nuca, P. Todos and V. Eşanu, "Urban electric vehicles traction: Achievements and trends", 2012 International Conference and Exposition on Electrical and Power Engineering, pp. 76-81, 2012.
3. L. Frederick and G.K. Dubey, "AC motor traction drives – a status review", Sadhana, vol. 22, pp. 855, 1997.
4. A. Ametani, "The Application of the fast fourier transform to Electrical transient phenomena", The International Journal of Electrical Engineering & Education, pp. 277-287, 1973.
5. ID. Nicolae and PM. Nicolae, "Using wavelet transform for power systems", Revue Roumaine des Sciences Techniques Serie Electrotechnique et Energetique, vol. 57, no. 2, pp. 172-182, 2012.
6. P. Vas, Sensorless Vector and Direct Torque Control, Oxford University Press, 1998.
7. L. M. Burrows, D. S. Zinger and M. E. Roth, "Field oriented control of induction motors", Proceedings of the 25th Intersociety Energy Conversion Engineering Conference, pp. 391-396, 1990.
8. W. Czuchra and W. Zajac, "The Problems of Electromagnetic Compatibility Interferences Generated by a Trolley-Bus and Tram", Proc. of International Symposium on Electromagnetic Compatibility – EMC Europe, vol. 2, pp. 788-791, Sep., 4-8, 2006.

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9. J. Catrysse, F. Vanhee, J. Knockaert, I. Hendrickx and V. Beauvois, "In Situ Testing of Large Machines: Alternative Method for Conducted Emission Measurement", Proc. IEEE Symposium on Electromagnetic Compatibility, pp. 1055-1060, Aug., 2008.

10. R. Smolenski, "Influence of conducted EMI on Power Systems and Novel Filtration Methods for Power Electronics in Smart Grids", Proc. of IEEE Int. Symposium in EMC, pp. 1-20, 2013.

11. F. Costa, C. Vollaie and R. Meuret, "Modeling of Conducted Common Mode Perturbations in Variable-Speed Drive Systems", IEEE Trans. on Electromagnetic Compatibility, vol. 47, no. 4, pp. 1012-1021, nov. 2005.

12. P.M. Nicolae, I.D. Nicolae and I.G. Sîrbu, "Solution for the Reduction of the Electromagnetic Influences from an Electric Driving System", Proc. of IEEE Symposium EMC, pp. 58-63, 17-21 August, 2008.