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A monovoltage equivalent model of bi-voltage autotransformer-based electrical systems in railways

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Abstract-

This paper presents an equivalent model that allows representing bi-voltage autotransformer based systems (such as 2x25kV AC, 2x15kV AC) as if they were mono-voltage systems. This model can be used for symmetrical (such as 2x25kV 50Hz systems) and unsymmetrical (such as 12/24kV 25Hz systems) configurations. It is based on two simplifying hypotheses that establish relationships between currents and voltages in the positive and negative phases. These hypotheses are discussed and the accuracy of the model is evaluated by comparing the results with a detailed conventional model of power supply systems.

Index Terms- Rail transportation power system, Power system modeling

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