METHOD FOR DETERMINING QUALITY INDICATORS OF ELECTRICAL POWER

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Abstract. This paper proposes to introduce a small number of quality indicators for electrical power in systems with three-phased consumers which are disbalanced, asymmetrical and distorting. These indicators are required for measuring and predetermining the effects of such consumers on the supply network in order to establish measures for improving the quality of power supply in the electrical networks.

Keywords: Quality indicators, electrical power, energy quality

1. Introduction

The problem related to the power quality in electrical networks are the following:
- frequency variations;
- active and reactive power shocks;
- distorting, asymmetrical and disbalanced regime.

This last problem has some very important consequences:
- the increase of power losses and active power;
- the interblocking of installations transport and supply capacity;
- difficulties related to the voltage regulating;
- parasitic torques in electrical machines;
- errors done by measure and control apparatus.

2. Three-phased disbalanced, asymmetrical and distorting consumer

Let it be a three-phased asymmetrical consumer R, S, T, whose impedances $Z_R \neq Z_S \neq Z_T$.

Supplied from a three-phased voltage system $u_R, u_S, u_T \in u_{RST}$ with disbalanced currents $i_R, i_S, i_T \in i_{RST}$ running under distorting conditions.

Instantaneous value expressions and the phase voltage $u_{RST}$ and the $i_{RST}$ currents are:

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