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Some ecological problem with overhead power transmission lines with high current-carrying capacity

***Abstract**. Power transmission lines create problems with exploitation of area under them and in some ranges along them. These problems are connected with permissible distances between lines and other objects and electric and magnetic fields intensities. The main aim of paper is estimation of problems with exploitation of area near overhead lines taking into consideration the new tendency in usage of wires and construction of towers.*

Keywords: Overhead power transmission lines, wires, towers, electric field intensity, magnetic field intensity, current-carrying capacity.

Introduction

Overhead power transmission lines (OPTL) create problems with exploitation of area under them and in some ranges along them. There are many governing regulations, rules and standards. The results of utilization of these rules are permissible distances.

The most important parameter of OPTL is the highest value of power, which can be transmitted by these lines. The increase of current-carrying capacity may be realized by monitoring of temperature of traditional AFL conductors or by application of high temperature low sag conductors (HTLS). The increase of currents in wires causes the increase of magnetic field (MF) intensity near OPTL.

Electric and magnetic fields near new OPTL

According to polish regulation [1] in places appropriated for the public buildings the highest value of electric field (EF) intensity must not be higher than 1 kV/m and MF intensity 60 A/m. EF is usually the main criterion which determines the distance of buildings from OPTLs, because near OPTL 110 kV and above there are places, where EF is higher than 1 kV/m, while MF intensity is usually lower than 60 A/m. The problem is with AFL conductors with monitoring of temperature and HTLS conductors, because calculations for such the OPTLs show, that the permissible value for MF intensity 60 A/m is exceeded. This fact may change the possibility of exploitation of area near OPTLs.

References

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