

**Title:** Protection of wind energy systems against the indirect effects of lightning

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**Source:** Renewable Energy

**Volume:** 36 **Issue:** 11 **Pages:** 2888-2896 **DOI:** 10.1016/j.renene.2011.04.011 **Published:** Nov 2011

**Document Type:** Article

**Language:** English

**Abstract:** This paper is concerned with the protection of wind energy systems against the indirect effects of lightning. As wind energy is gaining increasing importance throughout the world, lightning damages involving wind energy systems have come to be regarded with more attention. Nevertheless, there are still very few studies in Portugal regarding lightning protection of wind energy systems using models of the Electro-Magnetic Transients Program (EMTP). Hence, a new case study is presented in this paper, based on a wind turbine with an interconnecting transformer, considering that lightning strikes the soil near the tower at a distance such that galvanic coupling occurs through the grounding electrode. Computer simulations obtained by using EMTP-RV are presented and conclusions are duly drawn. (C) 2011 Elsevier Ltd. All rights reserved.

**Author Keywords:** Electromagnetic Transients; Lightning Protection; Wind Energy

**KeyWords Plus:** Networks; Struck; Farm

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**Publisher:** Pergamon-Elsevier Science LTD

**Publisher Address:** The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

**ISSN:** 0960-1481

**Citation:** RODRIGUES, R. B., MENDES V. M. F., CATALÃO J. P. S. - Protection of wind energy systems against the indirect effects of lightning. Renewable Energy. ISSN 0960-1481. Vol. 36. n. 11 (2011) p. 2888-2896.