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EFFICIENT LIGHTNING PROTECTION: OPTIMIZATION OF ECONOMIC, ENVIRONMENTAL AND SAFETY ASPECTS

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Abstract

It has been shown that the scale of damage in buildings with steel reinforcement, due to direct lightning strikes, is insignificantly small compared to lightning effects on buildings with no such steel reinforcement. Observed small-scale damages are also confined to points of strike; hence the only risk for occupants and properties is injury or damage caused by falling materials. A large number of such cases have been observed in Sri Lanka and Malaysia. All damaged structures, observed in this study, have a steel reinforcement structure, which may not be in compliance with specifications in IEC 62305-3, for it to act as the sole down conducting system. Such observation prompts us to re-examine specifications set forth in standards, which are difficult to be achieved in practice and also not applicable to buildings that have already been constructed. Existing recommendations prevent engineers from using steel reinforcement as the down conductor in many cases; a fact that leads to the addition of large amount of copper unnecessarily into the environment, non-installation of protection systems or adoption of non-conventional systems.

Key words: building safety, built-in environment, cost effectiveness, lightning protection, steel reinforcement

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