Hotels and Resort

Lightning Protection

Lightning is a natural phenomenon that can of course generate heavy consequences on hotels and resorts for people, structures and equipment. However these consequences can be avoided with an adapted lightning protection. The steps to follow are described below:

- **Lightning Risk Analysis** to determine accurately the risks taking into account of the various possible scenarios. People protection should be addressed with a deterministic method even if the statistical risk remains quite low. Furthermore the economic risk should be taken into account.
- **Technical Study** of the needed protection means in order to reduce the risk below the determined risk level. Protection should of course address people (employees as well as tourists) but also the structure or the structures (in case of bungalows on a beach for example) and equipment (fire mitigation means, safety means, alarm system, computers and payment terminals ...). Outside of people protection, economic aspects should be integrated in the selection of protection means.
- **Inspection after erection of the Lightning Protection System** and periodic inspection to validate the efficiency of the protective measures as well as its longevity and associated user trainings.

### 1. Risk Analysis

Lightning risk depends on the various possible scenarios. We can potentially observe:

- Impact on people outside of structures (open areas) : swimming pool, beaches, gardens, terraces etc.
- Impact on people near structures (metallic structure or Lightning Protection System downconductors)
- Fire risk in the structure triggered by lightning. It is then important to take care of the fire protective means (smoke detectors, fire alarm system ...).
- Damage to electrical and electronic equipment (warning system, telephone, computers, payment system, booking system, air conditioning, lifts, lighting etc.

The Lightning Risk Analysis is a statistical method to evaluate the risk and to define as well as needed protective level to cover that risk. This statistical analysis is completed by a deterministic approach regarding people protection. Another deterministic method is used for the important safety devices (fire alarm system, safety system ...) or for equipment directly related to the hotel operation (computer system, payment terminals ...). As matter of fact for people and these equipment, the risk, even if statistically low, is still too important and protection means are necessary whatever is the statistical risk level.

In general a single risk analysis is not enough and up to three analysis need to be performed. First one (named R1 in IEC 62305-2 standard) has a single target : people protection. It consist mainly to ensure that in case of a fire triggered by lightning, he escape route will be safe and that fire brigade access will be guaranteed: it is then necessary that the fire protective means (smoke detectors, fire alarm system ...) don’t be degraded by lightning surges.

The second calculated risk (named R2 in IEC 62305-2 standard) consists in validating the functionality of operational installations (computers, outdoor lightning, safety cameras ...). What are the important systems need to be defined in cooperation with the hotel manager. The last and third analysis (named R4 in IEC 62305-2 standard) allows to validate the economic risk level. The cost of protection and maintenance cost are compared to the statistical damage cost on an annual basis. This method non only allows to know what will be the generated money savings thanks to the lightning protection but also to determine the more adapted protection means taking care of their economic efficiency for the hotel and resort.
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2. Technical Study of protection means

The Technical Study of protective means allows to identify the most effective protections capable of reducing the risk below the level defined by the LRA. It must consider the potential means of protection and implementation difficulties both aesthetic and technical. For example, for a Resort with bungalows on the sea shore or directly on the sea, it will not be economic to protect each bungalow and even if the economic factor is not considered, the setting-up of grounding on a beach creates technical difficulties and visual impairments also hardly compatible with the main objective of a Resort.

3. Inspection of protection means

The protection means, including the possible storm detector, must be subject to an initial check at the end of the work to validate their compliance and their settings. After acceptance of installation, it is necessary to keep it in condition, by controlling at least every two years the value of the earthing system, the visual condition of the protective equipment and condition of the SPDs as well as the good operation of thunderstorm detection and related procedures. It is important to have chosen during installation or technical study protection means without maintenance or equipped with integrated fault indicators. The complexity of maintenance must be taken into account in the calculation of economic risk. Any significant change in the hotel complex should also lead to an analysis once it concerns the outside of structures (new air conditioning on the roof or facade ...) to ensure that it does not degrade the initial protection.